

VIDEO ON CDs **COMING SOON TO A HOME NEAR YOU**

# AUDIO

## EUROPEAN HI-FI SHOWS

THE EQUIPMENT AUTHORITY  
DECEMBER 1994

**BEST BETS  
TESTED**

**HARMAN  
KARDON**  
A/V RECEIVER

**MARK  
LEVINSON**  
PREAMPLIFIER

**CONRAD-  
JOHNSON**  
MONO AMPLIFIER

**KEF** SPEAKER

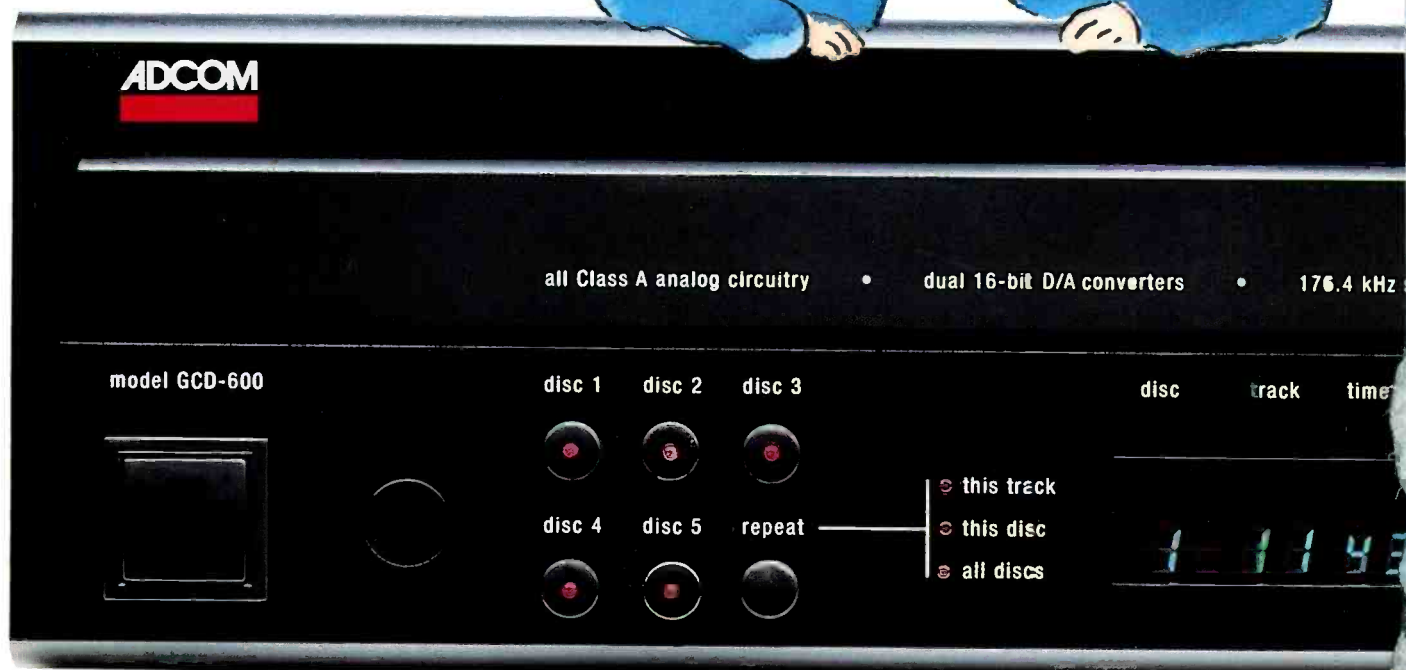
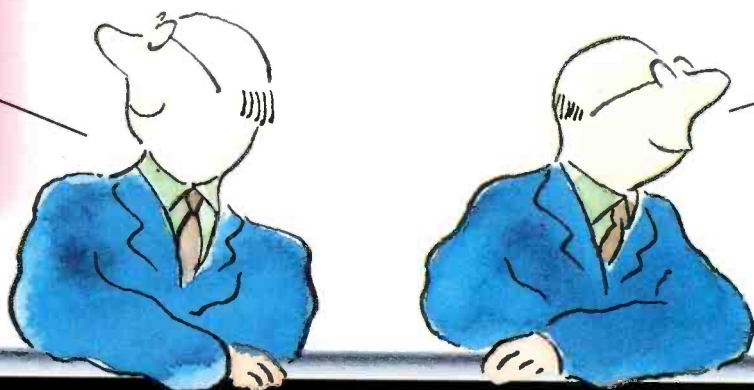


US \$3.50  
UK £1.95  
CAN \$3.

mark levinson  
Premier Twelve

# We also design disc player t

*"It yielded tight, well-controlled sound whose overall balance and imaging was beyond reproach."*



Adcom's compact disc players have always turned the heads of industry critics. Recent comments when reviewing the GCD-600 in *High Performance Review*. Stop by your local store. The best heads in the business are saying about Adcom's components.

# ed our carousel o turn heads.

*"...the Adcom GCD-600 came about as close as we have heard from CD players and separate player/converter combinations costing several times as much."*



*"The piano concerto was impressively reproduced and the clarity and total accuracy prompted us to listen to it over and over again."*



tly, Martin Forrest wrote the above  
local Adcom dealer and listen to what

# ADCOM<sup>®</sup>

*details you can hear*

11 Elkins Road, East Brunswick, NJ 08816 U.S.A. (908) 390-1130

Distributed in Canada by PRO ACOUSTICS INC. Montréal, Québec (514) 344-1226

Enter No. 1 on Reader Service Card

# WHY WE'RE INTRODUCING A TWO DOOR NEON.

( A. )

WE RAN OUT OF DOORS.

( B. )

WE FORGOT TO PUT THE OTHER  
DOORS ON.

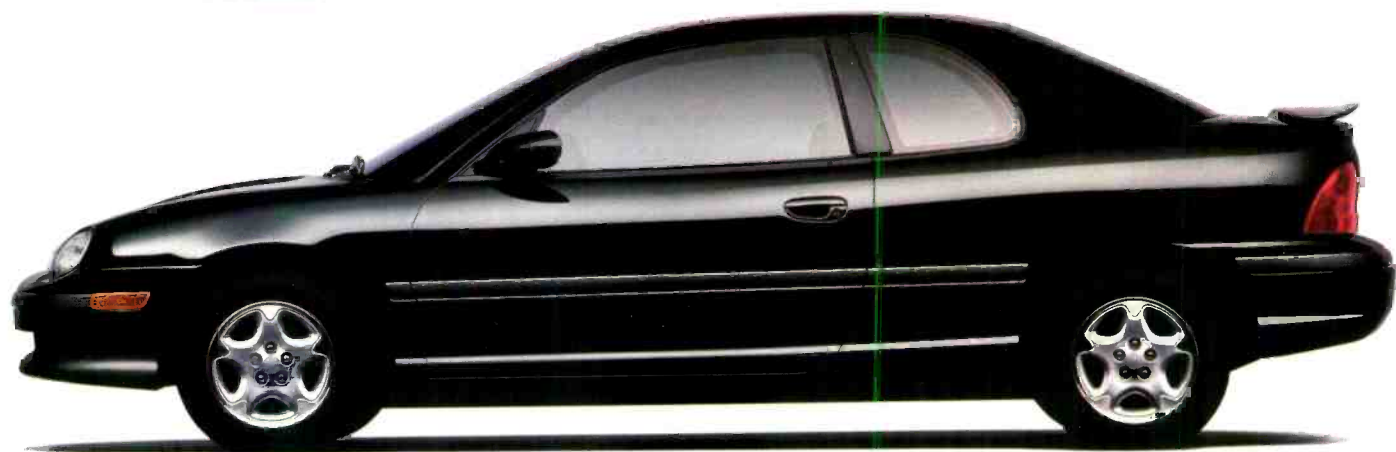
( C. )

ONE DOOR DIDN'T SEEM LIKE ENOUGH,  
BUT THREE SEEMED LIKE TOO MANY.

( D. )

SOME PEOPLE LIKE TWO DOORS BETTER  
THAN FOUR DOORS.

**Hi.** Now, to go with our friendly, familiar Dodge Neon four-door, there's a Neon for people who like things in twos. The Neon Sport Coupe. With a really responsive 2.0 liter engine. Two airbags (driver and front passenger), standard. And, perhaps most obviously, two doors. Of course, we haven't lost our fondness for things in fours. You'll also get four valves per cylinder in the husky four-cylinder engine. Four-wheel anti-lock disc brakes. Four 14" aluminum wheels fitted with four all-season performance tires, attached rock-solidly to a four-wheel independent performance suspension.



The new Dodge Neon Sport Coupe. One more wonderful Neon, with two less doors, to choose from. At your friendly Dodge dealer.

## NEON SEDAN & COUPE



**THE NEW DODGE**

1-800-4-A-DODGE

Always wear your seat belt.

Enter No. 30 on Reader Service Card

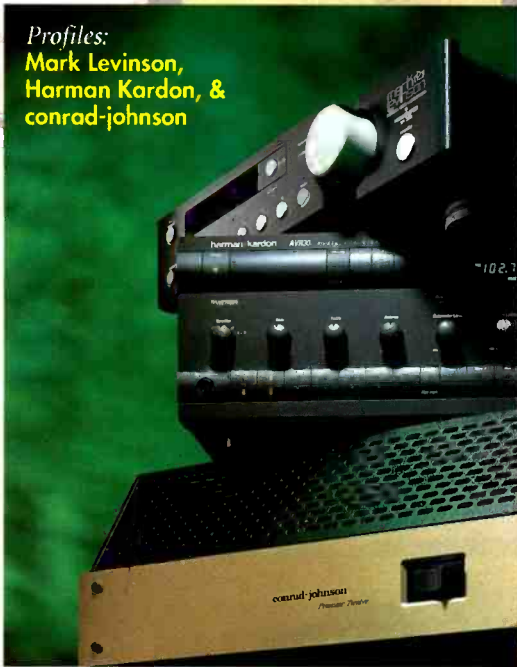
# AUDIO

THE EQUIPMENT AUTHORITY



Video CD,  
page 38

*Profiles:*  
Mark Levinson,  
Harman Kardon, &  
conrad-johnson



## feature

VIDEO CD: A CODING CHALLENGE Robert A. Finger .....	38
ANNUAL INDEX .....	141

## equipment profiles

HARMAN KARDON AVR30 A/V RECEIVER Edward J. Foster...	48
KEF Q70 SPEAKER D. B. Keele, Jr. ....	71
CONRAD-JOHNSON PREMIER TWELVE MONO AMP Bascom H. King. ....	80
ELECTRO-VOICE N/D 857B MICROPHONE Jon R. Sank .....	88

## auricles

ALTEC LANSING AC10 COMPUTER AUDIO CONTROLLER John M. Woram, .....	96
MARK LEVINSON NO. 38S PREAMP Anthony H. Cordesman ..	98

## departments

FAST FORE-WORD Eugene Pitts III .....	6
WHAT'S NEW .....	8
AUDIO ETC Edward Tatnall Canby.....	16
MONDO AUDIO Ken Kessler.....	20
SIGNALS & NOISE .....	26
AUDIOCLINIC Joseph Giovanelli .....	34
PLAYBACK .....	144

## recordings

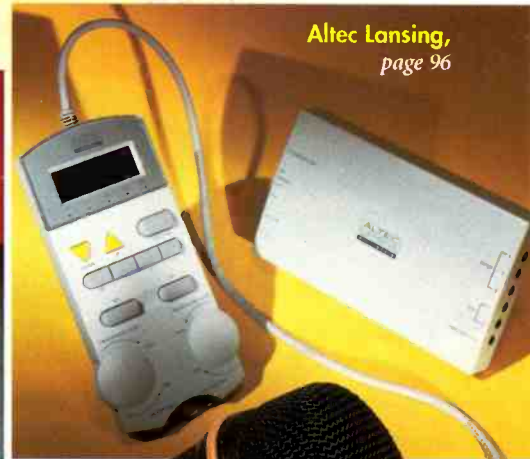
CLASSICAL .....	102
ROCK/POP .....	110
JAZZ & BLUES .....	120

The Cover Photographer: Bill Kouirinis Studio  
The Cover Equipment: Mark Levinson No. 38S preamp,  
Harman Kardon AVR30 A/V receiver, and  
conrad-johnson Premier Twelve mono amp

Audio Publishing, Editorial, and Advertising Offices,  
1633 Broadway, New York, N.Y. 10019  
Subscription Inquiries, (303) 447-9330



Polk,  
page 8



Altec Lansing,  
page 96



Electro-Voice,  
page 88

**acurus**  
Accuracy from the U.S.



Acurus Family of Amplifiers: The Stereo A250 and A150, The Three Channel 200X3 and 100X3 Featuring Precision Crafted Military-type Construction.

**"If you want to be treated like one of the masses, go into a mass market store and buy mass produced product."**

## **ACURUS vs THEM**

### **ACURUS**

### **THEM**

---

95% of dealerships are independently owned.

A chain store.

---

Owner personally manages the store.

Who knows who's really in charge?

---

Audio consultants with years of experience.

Kids trying to make a buck.

---

Several serious listening rooms.

A room crammed with look alike product

---

Will remove the top cover to show build quality.

Probably won't even have a screwdriver.

---

Will come to your home and install the system.

You'll be lucky if they load it into your car.

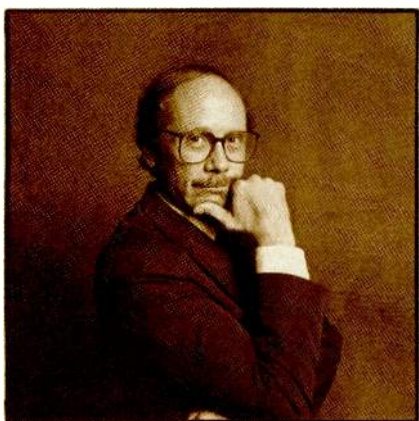
---

Each Acurus audio component is individually hand-crafted in America. Acurus stands apart in sound, feel, fit and finish. If you want to be treated as an individual please phone 914-693-8008 for an Acurus dealer near you.

## **MONDIAL DESIGNS LIMITED**

2 Elm St. Ardsley, NY 10502 • 914-693-8008 Fax 914-693-7199

Enter No. 27 on Reader Service Card



One specialized magazine I browse is *Physics Today*, from the American Institute of Physics, which also publishes the *Journal of the Acoustical Society of America*. Reading the book reviews in

*Physics Today* helps keep me from having too narrow an outlook and, occasionally, provides me with an insight so strong that I feel I've just woken up. Such a feeling occurred when I read, in the September 1994 issue, David Mermin's review of Murray Gell-Mann's *The Quark and the Jaguar: Adventures in the Simple and the Complex* (published by Freeman). Much of what the reviewer wrote seems to me to apply to the state of our audio industry—that is, with fights between the objectivists and the subjectivists and between people wanting home theater versus those wanting to stick with standard stereo reproduction.

Murray Gell-Mann is a top-flight physicist. His book, Mermin writes, "is all about complex adaptive systems, entities of great intricacy and depth that operate profitably on the information stream. . . ." Gell-Mann himself is "a famously complex and virtuosically adaptive system," says Mermin.

This adaption, the subject of the book, operates in other fields than biology, says Mermin, in culture, science, creative thinking, computer simulations, economics, and the development of language. The reviewer goes on to write of the possibility of two "concurrently operating IGUSes—information gathering and utilizing systems—recording quite

different versions of the tree of possible histories. Could two such IGUSes become aware of each other and even communicate?"

I was struck by how similar this vision is to one expressed by Dick Heyser, who wrote speaker reviews for *Audio* for many years. In several articles written during the late '70s and '80s for *Audio* and the *JAES*, Heyser discussed a theory whereby different frames of reference might be translated from one to another. This translation was an attempt by Heyser to solve what he termed in a 1976 letter to the *JAES* "one of the greatest problems of audio engineering, learning to analyze and measure what we 'hear.'" What Heyser was attempting to do was "bring both the personal experience of subjective perception and the description of physical processes under one common set of rules." He thought that every serious discussion of the perception of sound, whether based on measurements or on commonly used descriptive language, had a geometric component. Analysis of these components could be used, he thought, to "map" from the subjective perception to measurement (or vice-versa) by using that common set of rules.

Mermin calls the final section of Gell-Mann's book "a moving plea for greater rationality in human affairs," and again I am struck by the similar vein of seriousness, though Heyser had limited himself to a more narrow subject. Mermin quotes Gell-Mann about the prospects: "We are all in a situation that resembles driving a fast vehicle at night over unknown terrain that is rough, full of gullies, with precipices not far off. Some kind of headlight, even a feeble and flickering one, may help to avoid some of the worst disasters." And, I would add, a little thought about what it's like to drive the other fellow's car.

# AUDIO

THE EQUIPMENT AUTHORITY

V.P./EDITOR-IN-CHIEF  
Eugene Pitts III

ART DIRECTOR  
Cathy Cacchione  
ASSOCIATE ART DIRECTOR  
Linda Zerella

TECHNICAL EDITOR  
Ivan Berger  
MANAGING EDITOR  
Kay Blumenthal

ASSOCIATE MANAGING EDITORS  
Teresa Monge, Douglas Hyde

DIRECTORY EDITOR  
Ken Richardson  
ASSISTANT EDITOR/MUSIC  
Michael Bieber  
ASSISTANT EDITOR  
Gerald F. McCarthy

ASSOCIATE EDITOR  
Edward Tattall Canby

SENIOR EDITORS  
D. B. Keele, Jr., David Lander

CONTRIBUTING EDITORS/ARTIST  
Michael Aldred, David L. Clark, Anthony H. Cordesman,  
Ted Costa, John Diliberto, Frank Driggs, John Earle,  
Edward J. Foster, Joseph Giovanelli, Ken Kessler,  
Bascom H. King, Edward M. Long, Robert D. Long,  
Paul Moor, Jon W. Poses, Jon R. Sank, John Sunier,  
Michael Tearson, Jon & Sally Tiven, Michael Wright

V.P./GROUP PUBLISHER  
Tony Catalano (212) 767-6061

V.P./ADVERTISING DIRECTOR  
Scott Constantine (212) 767-6346

GENERAL MANAGER Greg Roperti  
BUSINESS MANAGER Christine Z. Maillet  
PRODUCTION DIRECTOR Silvia Coppola  
PRODUCTION MANAGER Lynn O. Onoyeyan  
PROMOTION COORDINATOR Elizabeth P. O'Keefe  
RESEARCH MANAGER Dru Ann Love  
OFFICE MANAGER Aline J. Pulley  
OPERATIONS MANAGER Sylvia Correa  
AD COORDINATOR Linda Neuweiler

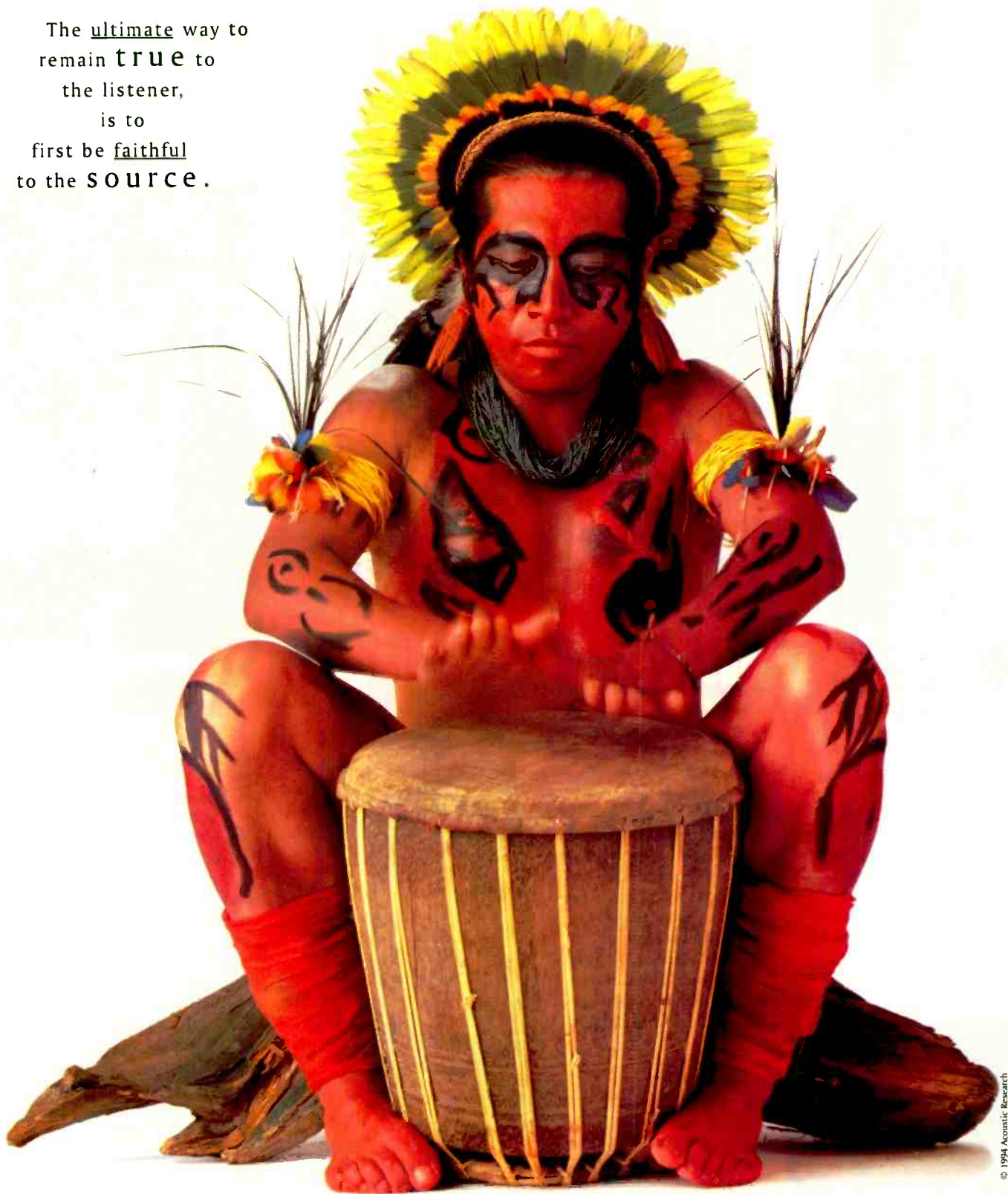
ADVERTISING  
REGIONAL V.P./AD DIRECTOR, EAST COAST  
Charles L. P. Watson (212) 767-6038  
REGIONAL ACCOUNT MANAGER  
Christine B. Forhez (212) 767-6025  
MIDWEST ADVERTISING MANAGER  
Jerry Stoeckigt (312) 923-4804  
REGIONAL V.P./AD DIRECTOR, WEST COAST  
Bob Meth (213) 954-4831  
WESTERN MANAGER  
Paula Mayeri (213) 954-4830  
NATIONAL RECORD LABEL SALES  
MAG Inc. Mitch Herskowitz (212) 490-1715  
Steve Gross (212) 490-1895



CHAIRMAN Daniel Filipacchi  
PRESIDENT, CEO, AND COO David J. Pecker  
EXEC. V.P. AND EDITORIAL DIRECTOR  
Jean-Louis Ginibre  
SR. V.P./GLOBAL ADV. Paul DuCharme  
SR. V.P./DIR., CORP. SALES Nicholas Matarazzo  
SR. V.P./CFO & NEW BUSINESS DEVELOPMENT  
Paul DeBenedictis  
V.P., GENERAL COUNSEL Catherine Flickinger  
V.P., MFG. & DISTRIBUTION Anthony Romano  
V.P., CIRCULATION David W. Leckey  
V.P., RESEARCH & MKTG. SERVICES Susan Smollens  
V.P., COMMUNICATIONS & SPECIAL  
PROJECTS Keith Estabrook  
V.P., MAGAZINE DEVELOPMENT Marcia Sachar  
V.P., DIR., CREATIVE SERVICES, CORP. SALES  
Lynn Chaiken



The ultimate way to  
remain **true** to  
the listener,  
is to  
first be faithful  
to the **SOURCE**.



© 1994 Acoustic Research

**AR**

The way life sounds.

The new AR 303, 302, 338, 228, 208v & 218v loudspeakers. 1-800-969-AR4U.

Enter No. 48 on Reader Service Card

# WHAT'S NEW



## Celestion Speaker

Designed for adaptability, the *SoundStyle MPI* is weather-resistant for outdoor use and shielded for use near video and computer monitors. The table stand shown can also be wall- or ceiling-mounted, and swivels permit the speaker to be aimed and locked in almost any position. This small Celestion uses a 4½-inch woofer in a fourth-order vented cabinet, together with a 1-inch dome tweeter. Response is rated as 70 Hz to 20 kHz, ±3 dB, and impedance is 8 ohms. Sensitivity is 90 dB, and power handling is rated at 150 watts, with automatic protection



above that level.

The MPI is available in dark gray or soft white, and is paintable.

Price: \$299 per pair.

For literature, circle No. 102



## Polk Surround Speaker

By selecting dipole or bipole operation, users can optimize Polk LS *f/x* surround speakers for placement at the side or rear of the listening area. Each of the speaker's two slanted baffles holds one 4½-inch driver and one 1-inch dome tweeter. The larger drivers' cones are of composite polyamide with aramid fibers, while the tweeter domes are of trilaminate (aluminum, stainless steel, and polyamide) construction. An integrated mounting system allows the speaker to be mounted with its slanted baffles facing up or down; an optional wall bracket can be used where precise aiming is desired. Frequency response is 60 Hz to 26 kHz. The LS *f/x* is available in black or white. Price: \$549.95 per pair.

For literature, circle No. 104

## Newform Research Speaker

Standing atop the Newform Research R8-1's woofer enclosure is a 15-inch tall ribbon tweeter (a 30-inch is optional, for an expanded soundstage). The woofer has an 8-inch poly cone. Frequency response is 36 Hz to 17 kHz, ±3 dB, on axis and 30° off axis. Sensitivity is 87 dB, and amplifier requirements are 30 to 125 watts per channel. Prices: \$1,795 per pair; \$2,095 per pair with 30-inch ribbon. For literature, circle No. 100

## Thiel Speaker

Standing 55 inches tall, the four-way CS7 Coherent Source speaker from Thiel features a front baffle of thick, cast concrete, for rigidity. The metal-diaphragm tweeter is coaxially mounted in the upper midrange driver, with a waveguide to eliminate frequency response problems of conventional coaxes. The woofer has a 12-inch diaphragm. Frequency response is 25 Hz to 18 kHz, ±1.5 dB. Price: \$8,500 per pair. For literature, circle No. 101



## Fried Speaker

Fried has long been associated with transmission-line enclosures, and the Studio V has two of them, one each for bass and for midrange. The 8-inch polypropylene woofer and the 6½-inch Kevlar-laminate midrange have vented pole pieces; the tweeter is a ¾-inch

double-chamber dome.

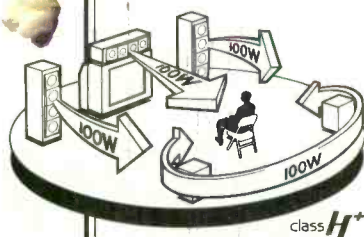
The systems are constructed in mirror-imaged pairs for inward dispersion, as a means of reducing the effects of wall reflections. Anechoic frequency response is 30 Hz to 20 kHz. Price: \$3,595 per pair.

For literature, circle No. 103



HIGH TECHNOLOGY  
WITHOUT THE  
HIGH ANXIETY

# HOW TO BRING HOME THE RIGHT HOME THEATER RECEIVER.



class **H+**

The Class H+ amp sends equal power to all the channels for optimum home theater sound.

## HELP!

To talk to your nearest Technics dealer, call toll-free: 1-800-793-6912

ALL YOU HAVE TO KNOW ABOUT HOME THEATER RECEIVERS IS ONE NAME. TECHNICS. TAKE OUR NEW SA-GX770. IT'S POWERFUL. IT'S

**HOME THEATER** EASY TO OPERATE. AND DOLBY\* PRO LOGIC

SURROUND ENVELOPS YOU IN LIFE-LIKE HOME THEATER SOUND.\*\* THE TECHNICS HOME THEATER RECEIVER. YOU'LL GIVE IT TWO THUMBS UP.

**Technics®**  
The science of sound



The remote controls other Technics audio components and most brand-name video components.



The low impedance switch helps prevent blowing or damaging your speakers.

Proud Sponsor  
1996 U.S. Olympic Team



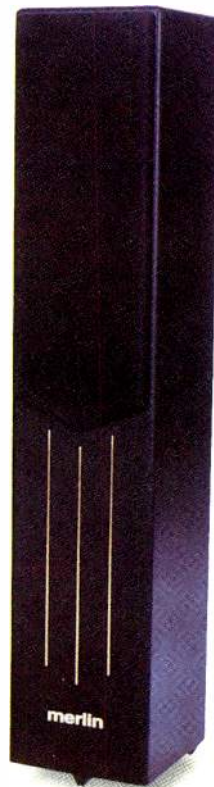
\* Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corp. \*\* When using video tape, laser disc or broadcast which is encoded with Dolby Surround.

# WHAT'S NEW



## Rosinanté Speaker

The cabinet of the Evolution, from Rosinanté, is cast of "a densified polymer with a composite matrix." In addition to resisting resonances, this material can be molded into complex forms, resulting in a smooth-fronted cabinet whose inner cavity is shaped to eliminate reflections, standing waves, and air friction. Designed for use with low-powered amps, the speaker has a sensitivity of 93 dB and a nominal 8-ohm impedance with a 6.8-ohm minimum; its frequency range is 28 Hz to 22 kHz. The system is available in white or black marble. Price: \$2,500 per pair. For literature, circle No. 106

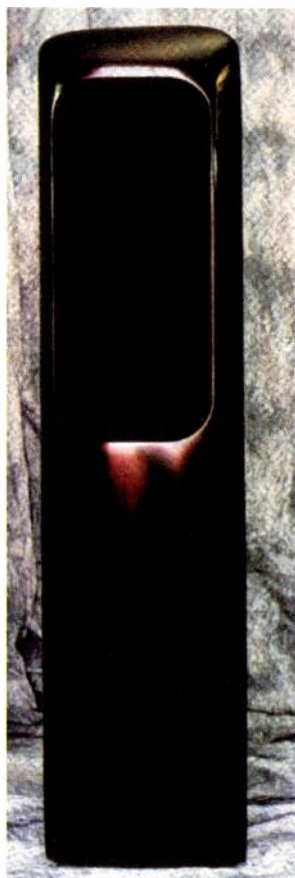


## KEF Speaker

The Model Two uses KEF's Uni-Q IV coincident midrange/tweeter driver and a 1-inch silk-dome tweeter centered at the base of a 6½-inch midrange driver's cone. The cone's curvilinear shape smooths midrange output and forms an acoustic waveguide for the tweeter. The driver is mechanically isolated from the cabinet. Dual 6½-inch woofers inside the InterPort Coupled Cavity enclosure are horizontally mounted, to avoid lateral cabinet vibrations; their opposing mechanical motions are coupled by a force-cancelling rod. Frequency response is 45 Hz to 20 kHz,  $\pm 3$  dB; sensitivity is 90 dB, and impedance is 4 ohms. The system is shielded, and its base can be filled with sand or shot. Price: From \$2,300 per pair. For literature, circle No. 108

## Snell Speaker

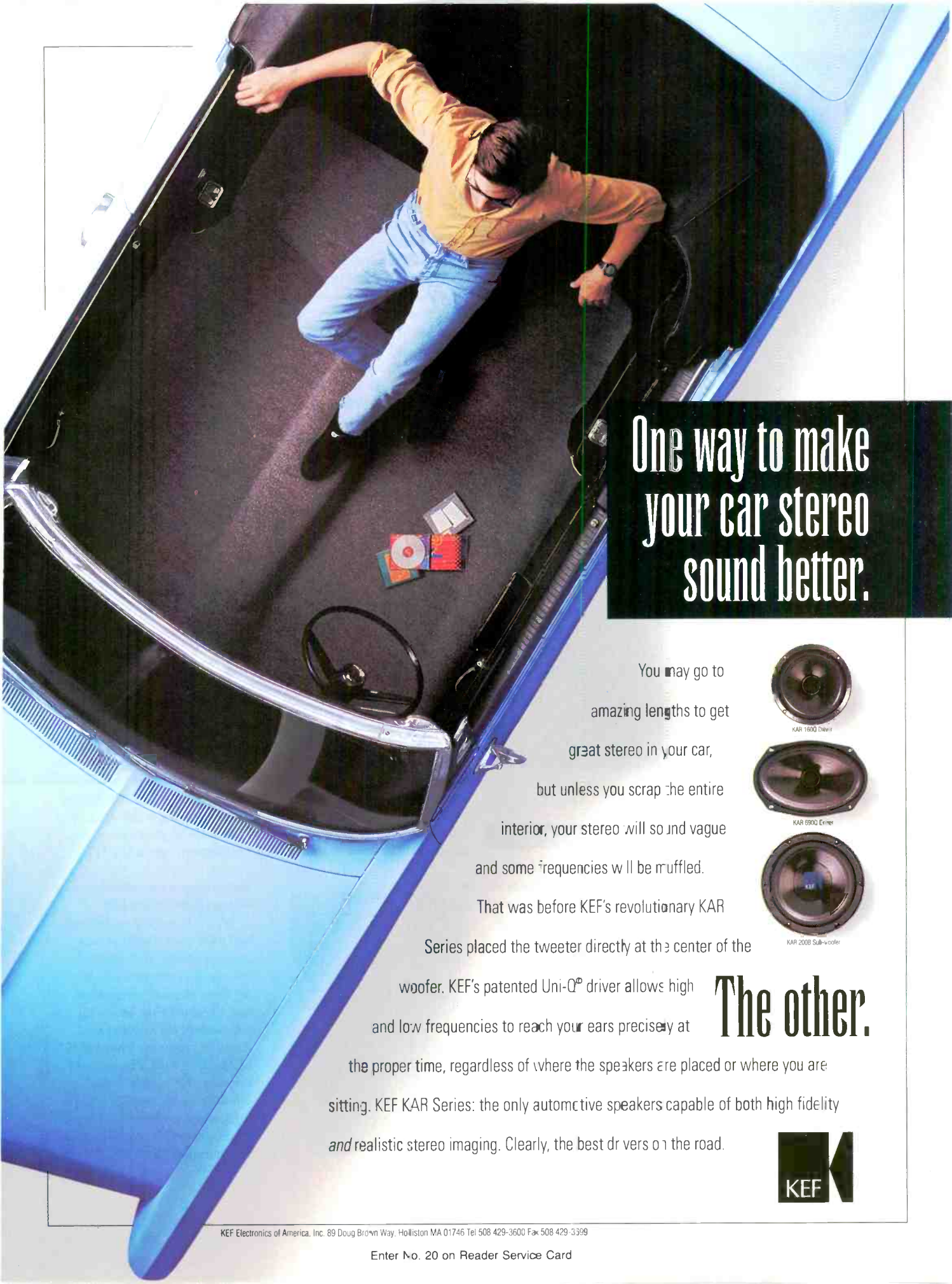
A further evolution of the Snell Type C speaker, the Type CV is a three-way, five-driver, tower design. Each unit's crossover/driver set is hand-tuned to match the master reference design within 0.5 dB, according to Snell. By mounting the two 8-inch woofers at different heights, the design reduces low-frequency room and boundary interactions; the tweeter is centered vertically between two midrange units to control dispersion and improve imaging. An additional 1-inch tweeter is mounted in the rear. Frequency response is specified as flat, within  $\pm 2$  dB, from 24 Hz to 20 kHz, both on axis and as much as 30° off axis. Sensitivity is 90 dB. The cabinet is 46¾ inches high and comes in oak, dark oak, walnut, and high-gloss black veneers. Price: \$2,499 per pair. For literature, circle No. 105



## Merlin Speaker

A two-way bass-reflex system, the Merlin VSM uses a DynAudio Esotar 1-inch dome tweeter, crossed over 1½ octaves above resonance to a 6½-inch woofer. The woofer has a 2-inch voice-coil, a vented pole piece, and a suspension that brakes excessive cone excursion. The enclosure has a front panel 1½ inches thick, with anti-resonance provisions that include a sand chamber (which also adds mass) and floor-coupling feet. On-axis frequency response is 55 Hz to 20 kHz,  $\pm 1.75$  dB, with -3 dB points at 45 Hz and 22 kHz. The speaker has a nominal 8-ohm impedance and 88-dB sensitivity; it can handle 200-watt program material, and its maximum output is 110 dB. Price: \$3,500 per pair. For literature, circle No. 107





# One way to make your car stereo sound better.

You may go to amazing lengths to get great stereo in your car, but unless you scrap the entire interior, your stereo will sound vague and some frequencies will be muffled.

That was before KEF's revolutionary KAR

Series placed the tweeter directly at the center of the woofer. KEF's patented Uni-Q<sup>®</sup> driver allows high and low frequencies to reach your ears precisely at the proper time, regardless of where the speakers are placed or where you are sitting. KEF KAR Series: the only automotive speakers capable of both high fidelity *and* realistic stereo imaging. Clearly, the best drivers on the road.



KAR 1600 Driver



KAR 690Q Center



KAR 200B Sub-woofer

## The other.



# WHAT'S NEW



## RA Labs Speaker

The BG Reference 4a is part of the RA Labs Black Gold Series, from RDL Acoustics, all designed by Roy Allison. The unit has an 8-inch woofer and 1-inch dome tweeter; frequency response is 46 Hz to 20 kHz,  $\pm 3$  dB, with usable bass ( $-8$  dB) extending to 34 Hz. Sensitivity is 90 dB. Price: \$224 per pair. For more information, call 800/227-0390.

## Genelec Powered Speaker

Smallest of Genelec's powered studio monitors, the 1030A uses a 6½-inch cone woofer and a ¾-inch metal-dome tweeter. The bi-amplified two-way system has a free-field frequency response of 55 Hz to 18 kHz,  $\pm 2.5$  dB, with  $-3$  dB points at 52 Hz and 20 kHz. Maximum output is 105 dB SPL for short bursts and 99 dB SPL long-term; THD at 90 dB SPL is 0.5% above 150 Hz and 3% overall. Short-term power output is 80 watts to the woofer and 50 watts to the tweeter; long-term power is limited by the drivers'

protective devices. The amplifier section has balanced input.

Price: \$2,198 per pair.

For literature, circle No. 111



## Infinity Speaker

Designed by Cary Christie, one of Infinity's founders, the IRS Epsilon is a four-way system. It uses three of the company's proprietary Electro Magnetic Induction planar drivers for the midrange and treble plus a 12-inch servo-controlled woofer for the bass. Rated frequency response is 30 Hz to 42 kHz,  $\pm 1.5$  dB; sensitivity is 87 dB SPL. The speaker is 59¾ inches high. Price: \$14,000 per pair. For literature, circle No. 109



## Design Acoustics Speaker

The faceplate holding the Design Acoustics PS•66's ¾-inch soft-dome tweeter overlaps the basket of the 6½-inch long-throw woofer. This reduced interdriver spacing helps the system approximate a point source, for a smoother crossover. A foam blanket around the tweeter and a narrow (8⅞-inch) front baffle minimize diffraction. Frequency



response is 55 Hz to 20 kHz, and power handling is 100 watts.

Price: \$299.95 per pair.

For literature, circle No. 112

## M & K Sound Satellite

Operating in push-pull, the two 5¼-inch woofers in the S-1C satellite from M & K are designed to reduce even-order harmonic distortion while increasing efficiency and power handling. (The speaker is rated for amps from 25 to 400 watts.) The dual 1-inch dome tweeters are open-back, transmission-line designs; the tweeter section of the cabinet is recessed to coordinate arrival times with the woofer signal. Both tonal balance and high-frequency radiation can be adjusted by the user. Price: \$1,495 per pair. For literature, circle No. 110



## Mirage Bipolar Satellite

With a ½-inch dome tweeter and a 4½-inch woofer at each end, the Mirage MBS satellite has bipolar radiation, suitable for front-channel or surround use. Designed to be used with subwoofers, the system has frequency response from 120 Hz to 20 kHz,  $\pm 3$  dB. The cabinet measures 10½ inches high, 6⅞ inches wide, and 4¾ inches high, and is available in black or white. Price: \$350 per pair. For literature, circle No. 113

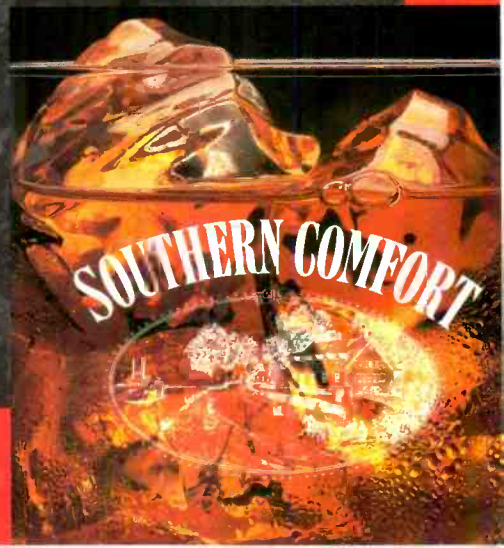




**Other seasons are  
for getting ahead.  
This one is for enjoying  
where you are.**

GIVE IT EASY. JUST CALL 1-800-BE-THERE TO SEND SOUTHERN COMFORT ANYWHERE IN THE U.S. EXCEPT WHERE PROHIBITED.  
Southern Comfort Company, Liqueur, 21-50% Alc. by Volume, Louisville, KY © 1994

**Take it easy.**



# WHAT'S NEW



## Panamax Surge Protector

Designed to protect Direct Broadcast Satellite (DBS) systems as well as other electronic gear, Panamax's MAX DBS AllPath can dissipate 672 joules of energy. One of its six a.c. outlets is unswitched, and two are turned 90° to accommodate plug-in transformers. Diagnostic lights show ground and line-fault status. The unit also includes coaxial connectors for satellite signals and for cable or antenna, clamping at 27 V and 11 V, respectively. Telephone line jacks are provided, for pay-per-view links. Price: \$189.

For literature, circle No. 114

## Neumann Microphone

The KM 184 from Neumann is a small-diaphragm cardioid condenser microphone. It uses the capsule from the Neumann KM 84 microphone and the



transformerless electronics of the TLM 170. Frequency range is 20 Hz to 20 kHz, with 16-dB A-weighted self-noise; maximum rated sound pressure level is 138 dB. Price: \$599. For literature, circle No. 117



## Soundstream THX Preamp

Soundstream's C-3 preamp has four A/V and four audio inputs, all buffered, and surround processing for THX, Dolby Pro Logic, stereo, and enhanced mono modes. Setup provisions include a test

microphone and sound-level indicator. A THX crossover is built in. The accompanying remote can be programmed with multistep macros and can control up to 10 separate components. Price: \$1,500. For literature, circle No. 118



## Quasar CD/LaserDisc Player

Playing CDs and LaserDiscs, Quasar's LD510 accepts all five types of disc formats and generates stereo sound using a MASH multiple-stage noise-shaping system. Other digital features include a time-base

corrector to compensate for picture defects in a disc and a digital circuit to separate video luminance and chrominance signals. A shuttle dial provides for fast-forward and review, and a magnetic clamping system centers the discs. Price: \$499.95. For literature, circle No. 115



## Resolution Audio D/A Converter

The Reference 20 Digital Processor, from Resolution Audio, uses an UltraAnalog D/A converter and other premium components, including

a separate, highly regulated power supply for the analog stages. Both BNC coaxial and ST glass optical inputs are provided, together with balanced as well as unbalanced analog outputs. Price: \$1,495.

For literature, circle No. 116

## NAD CD Changer

According to NAD, the three-disc carousel used in the Model 513 player is more reliable than five- or six-disc changer mechanisms and has capacity enough for most music-lovers' listening sessions. For longer continuous play, two discs can be replaced while the third is playing. An edit function calculates which tracks will fit on a tape, and the unit pauses the CD to permit



tape flipping or reversing. A one-bit MASH converter with 18-bit filtering is used; S/N is 105 dBA, and linearity is rated at  $\pm 0.5$  dB from 0 to -90 dB. A remote control is included. Price: \$399. For literature, circle No. 119





# McIntosh MC1000 POWER AMPLIFIER

Ever wonder why  
McIntosh components retain  
more of their original value  
than any other brand?

In an industry inundated with countless brands, fancy features and "Models of the Month," one manufacturer's equipment frequently sells for more *used* than when new. How can this be? Because, for more than 40 years, every McIntosh component and loudspeaker has been built to the

highest standards of American craftsmanship and engineering.

If the concept of lasting value means more to you than fads and gimmicks, write today for a free full-line McIntosh catalog. You'll discover why McIntosh components stand up to a test few others can pass. The test of time.



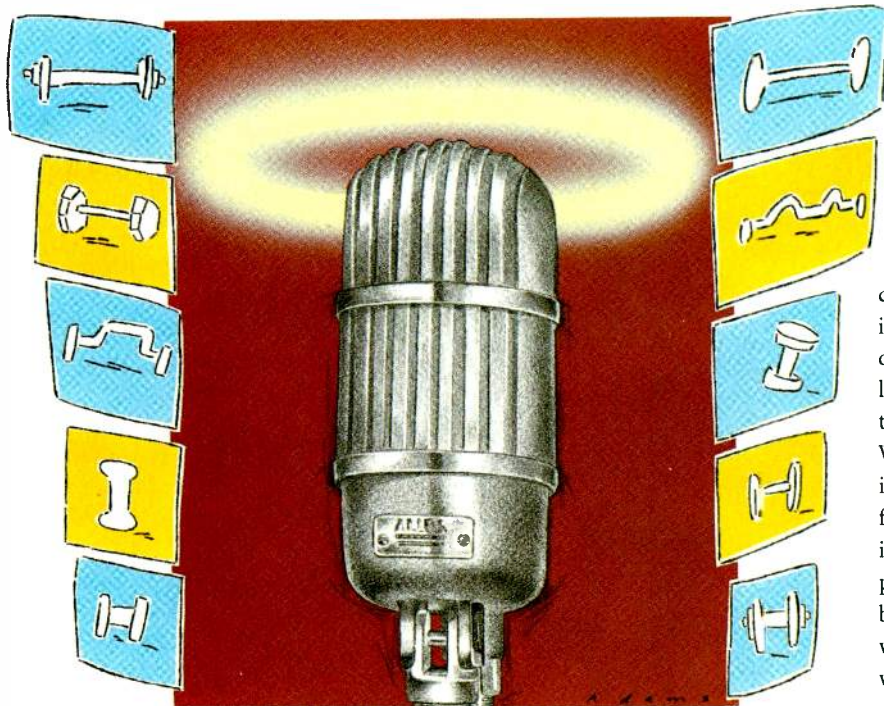
**McIntosh**  
Components of Excellence.

McIntosh Laboratory Inc., 2 Chambers St., Binghamton, NY, USA 13903-2699 (607) 723-3512 Fax (607) 724-0549

Enter No. 24 on Reader Service Card

EDWARD TATNALL CANBY

## TAPELESS RECORDING, TAKE TWO



Last month I ended with the very large thought that, just perhaps, the drastically compressed digital signal may turn out to be definitive in our future consumer audio—even for top state of our art. Heresy, no doubt, for many engineers! Not to mention consumers. But a possibility to keep in mind, even so. No—Epiphany Records, as described last month, does not use a Sony MD for its finished CD product; MD is merely a second-choice backup, with a professional Sony DAT as the third choice. Digital glass disc is the first. But I am stunned by the wider implications, just the same.

Continuing my account, I'm aware that, for all I know, there could be dozens of other recording engineers now making use of comparable equipment—after all, hun-

dreds of sessions are going on these days the world over, and I am no spider at the center of world communications! So I repeat, Epiphany, in terms of CD offerings at its recent beginnings, possibly the very tiniest record label of all (just one disc), struck me forcibly as being remarkable.

As any experienced reporter knows, one often gets an instantaneous first impression on a visit to some reportable event, with or without previous info. Something about the "setup," whether it's an impending riot in Africa or an impending recording of a Beethoven sonata, gives the alert mind a quick steer. I

knew nothing at all about this particular Epiphany session except the familiar name Kipnis and that a big church organ was to be the sonic source. Didn't even know the music to be recorded. So how does one recognize, instantaneously, something unusual in such a circumstance? One big thing is what I might call positive quirkiness.

Something odd, something new and strange, suggesting the unusual, if for better or worse.

For instance, after about two minutes in Epiphany's ad hoc control room in that New York church, I noticed an odd object lying on top of some rather massive audio equipment, the amplification for a pair of monitor speakers in stereo. (Handmade; you can order a pair for a good many thou.) I looked at that curious object atop the amps, and then looked again. Wha-? It was as if a triangle of bowling pins were to be seen lined up in front of one speaker system. It was indeed almost that—I found a 25-pound gym weight, round and black, just sitting there. When I later went down to the church itself, where the organ was playing—there were more of these absurdities, gym weights in the center aisle of the sanctuary! Did the Epiphany guys indulge in a bit of weight lifting during rest periods? Quirky indeed.

**DRASTICALLY COMPRESSED  
DIGITAL SIGNALS MAY  
BECOME DEFINITIVE  
IN OUR FUTURE  
CONSUMER AUDIO.**

When I finally did find a moment to ask someone, I found out the reason why: Anti acoustic resonance. The first weight in the control

room was to lower and perhaps eliminate any acoustic resonances in the monitor speaker amplifiers, not even a part of the recording chain. (Talk about perfection.) Those in the body of the church had a heftier purpose. The very unusual pair of microphones used (I'm coming to that), mounted together in a "one-

Illustration: Lisa Adams

point” stereo configuration, had each an entirely separate battery-powered audio system sitting on the church floor. On top of each was another gym weight, again to reduce possible acoustic resonances. This time with good reason—the main four-track railroad line uptown from Grand



**CLEARLY, THE THINNER  
THE MIKE'S DIAPHRAGM,  
THE MORE TRANSPARENT  
THE AUDIO SIGNAL.**

Central Station, covered and well below street level, was just outside the church! Note that these weights were not to suppress acoustic sound that might reach the mikes directly but rather to keep the associated electronic equipment stable in the post-mike circuitry, which I assume included the critical A/D conversion. In the midst of a session was no time to acquire more details; on such occasions I am always in fear of inadvertently causing disaster (longtime training in live broadcast). Later I discovered that if the gym weights were pleasantly quirky, there was more—such as you would not likely guess. The heavy microphone stand was filled, bottom to top, with lead shot! Same purpose. Innovation? A bit more than that.

The mikes themselves? You may guess that they were anything but stock items, however top-ranking. To my astonishment, the first time I had so much as heard the term for years, Jeremy Kipnis said casually

that these were PZMs by Crown. I did not know they still were being produced. The Crown company for a good many years ran both professional and high-level consumer equipment lines, and in those times I had much contact with them. But a few years ago they gave up the consumer end, and so I have been out of touch. (Crown is not one of our more flamboyant practitioners of public relations!)

Anyhow, when these unusual mikes were first presented in the Crown line (taken over from the original inventor), I was on hand for an extensive demo, on the West Coast as I remember, and wrote extensively on them in this magazine, so I will not repeat myself. (I quail at the thought of even trying to find those articles.) The PZM is a variant of what originally was called a condenser mike. The old “slim bottle” Altec, with a tube inside and a separate power supply (plus a thick and annoyingly unwieldy cable), was my standard mike for years. Condensers, as I will always call them, are, almost by genre, of high quality and excellent response as used in the audio profession, so the Kipnis-Ibish (executive producer) choice was in itself therefore not surprising.

What was, and one more unusual facet, is a Kipnis modification of these particular mikes in cooperation with Crown engineers, as Jeremy K. told me, whereby he got them to shave the delicate capsule face, if that’s what you might call it, *tenfold*, to something positively infinitesimal in thickness—1 micrometer! Clearly, the thinner the material, the more transparent the audio signal, but how to sustain it in place? One thinks of gold leaf, an ultra-thin sheet long used the world over for decorative purposes. I did not get further into this micro-mystery, but I surely would like to put hands on those Epiphany PZMs, my hands or somebody else’s.

All I can dredge up in memory at the moment concerning PZM is that the working capsule is placed extremely close to a flat surface, where there are remarkable and unusual acoustic patterns not found elsewhere.

I found only one point of real difference between Epiphany and me—that “one-point,” or coincident, stereo pickup. PZM or no, there it was in front of my eyes. I didn’t get a close look. As I was being



# FREE Stereo Catalog

- Convenient shopping — over 100 full-color pages covering hundreds of the latest stereos for your home and car, plus video and telephones
- Quality you can count on — Sony, Kenwood, Pioneer, JVC, Carver, Polk, Advent, Infinity, Bose, NHT, Panasonic, Mitsubishi, and more
- The information you need — including product descriptions, consumer tips, specifications, and our exclusive comparison charts
- There’s no other catalog like it! Get yours on its way to you today

**Call Now!**  
**1-800-955-9009**

8 a.m. to Midnight (Eastern time), 7 days a week  
or mail this coupon

Name

Address  Apt. #

City

State  Zip

**CRUTCHFIELD**

1 Crutchfield Park, Dept. AU, Charlottesville, VA 22906

briefed by Mr. Ibish while the communication speaker talked from upstairs and the organist, aloft at the base of the big organ (a tracker, Romantic style), answered back, suddenly a new take began before we had time to get out of the space. Instantly I froze in place, not moving a muscle and barely breathing, until the piece was finished. But I did have those moments, standing sidewise to the length of the church nave, to judge the quality of the live "stereo" sound. Wonderfully reverberant, yet very clear in detail, rather beautifully

voiced to the space, rank by rank of pipes, it seemed to me. Then we went up to hear the playback. That gorgeous reverb, with none of the pipes audibly directional at all—right for big organ music—was for my ear a lot less convincing in the playback than in the living sound via two ears.

"One-point" is much touted as providing stereo directionality. So it does, but should it? Often yes, but not often for big classical in big places. Relatively few such live performances feature specific directionality. A large symphony provides only a

moderate side-to-side direction for its instruments and groups of instruments as the bulk of the audience in the best seats (*not* close up front) hears the music. Organ music is the extreme in this respect. It's all multi-phase reverb, minus direction unless from radically separated "choirs" of pipes, not possible in a tracker organ. So, you see, "one-point" stereo is at a real disadvantage here, and that is what I heard. The use of more widely separated mikes reproduces a

**ORCHESTRAL LISTENERS  
IN THE BEST SEATS  
(NOT CLOSE UP FRONT)  
HEAR LITTLE LATERAL  
DIRECTIONALITY.**

FEEL  
THE

# REDUCTION

OF THE WORLD'S MOST MUSICAL  
TUBE COMPONENTS

good part of that superb sense of nondirectional presence that some of us miss in many of today's releases. Surely, with advanced digital recording and playback (except for broadcast) and no LP problems, we could risk the complications of phase differences more often than we do. It's in the interest of better musical reproduction, when the occasion warrants it.

A final note or two from Epiphany's voluminous specs. The digital recording on glass is via a Kipnis-devised computer algorithm involving pi and a lot more beyond my ken—with the end result a sampling rate of 88.2 kHz in 24-bit, which the same algorithm neatly converts down to the CD's standard 44.1 kHz and 16 bits. I dare go no further. (Everything at the session is controlled by a central computer that sits where the old VU meters used to preside.) The final, third-generation, digital copy is the CD itself, a lovely brass layered thing made by a company called KAO Optical, in case you'd like a brassy CD for your own label.

No musical comment here, much as I must praise the young organist who played Widor so faultlessly through take after take, Kent Tritle. His CD will be Epiphany #4, coming soon. So—a final audio quirk for you that will put you on the floor: The PZM microphone case was filled up with a mass of soft putty—guess why. As they used to say, putty *that* in your pipe. But better not smoke it. A

Enter No. 47 on Reader Service Card

YAKOV ARONOV AUDIO LAB, INC. TEL 213.653.3045 FAX 213.937.6905

AUDIO/DECEMBER 1994

18



WHERE DOES THE TWEETER  
OF A HIGH FIDELITY  
LOUDSPEAKER BELONG?

Q - S E R I E S



This question may confuse those who believe that the measure of a loudspeaker is the number of its drivers. It will also elude those who have never bothered to question conventional driver placement, which always separates the woofer from the tweeter.

In fact, the most acoustically correct location for the tweeter is precisely at the *center* of the woofer. This strategic placement creates a single sound source, allowing high and low frequencies to reach your ears at the proper time, regardless of where the speakers are placed or where you are sitting. (No wonder KEF's patented Uni-Q® is the technology of choice for advanced Home Theater applications.)

Perhaps the greatest benefit of the KEF Q Series speakers is that they sound as good in your home as they do in the showroom.

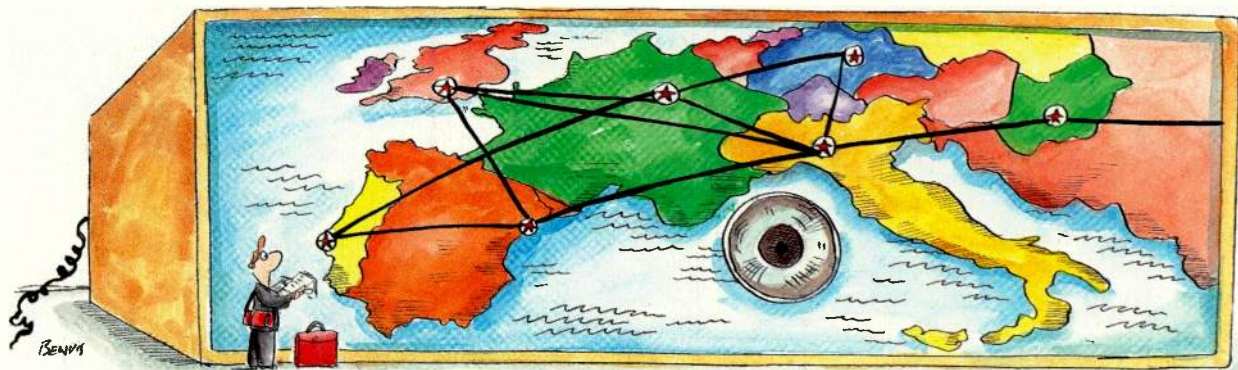


KEF Electronics of America, Inc., 89 Doug Brown Way, Holliston, MA 01746 Tel 508 429-3600 Fax 508 429-3699  
Distributed in Canada by: Pro-Acoustics Canada Ltd. Tel 514 344-1226 Fax 514 344-4760

Enter No. 21 on Reader Service Card

KEN KESSLER

# EUROPEAN AUDIO SHOWS



Europe likes to think of itself as one giant, happy trade zone, and so it is in many ways, what with the disappearance of trade boundaries, internal duty charges, and the like. However, it still consists of a number of unique, identity-crisis-riddled territories that insist on autonomy when the mood strikes, and this is despite a geographical spread that means the longest flights within Europe are only around 2½ hours long. This small spread helps explain why September came to have a specialist hi-fi show in London one weekend, followed by shows the next weekend in Paris, Barcelona, and Milan (the latter with a concurrent consumer electronics show)—followed a week later by a consumer electronics show back in London. (I haven't even confirmed whether or not there really was a show in Helsinki.)

Want an analogy, just to see what it did to the manufacturers and journalists who try to attend every audio fair in the world? Okay. Imagine, if you will, three weekends in a row starting with a show in New York, then shows in Atlanta, Miami, and (two in) Chicago, followed by a return to New York the next weekend. Is it any wonder that I, *Audio's* Man In Europe, had an awful time deciding which shows I should at-

tend while maintaining peace and harmony on the home front?

Actually, it was easy; I simply chose the most newsworthy exhibitions. The Hi-Fi Show at London's Heathrow Airport is Europe's premier specialist audio show, now in its bar mitzvah year, and it has the highest foreign visitor count after any show outside of the Big Four (the two CE shows, Berlin, and Tokyo). Remember, this show is pure hi-fi with a smidgen of home theater. No mobile phones, no Nintendo, no digital watches. So you can imagine the wealth of new hi-fi products to drool over in an event with 132 rooms representing nearly 300 brands. To put the Hi-Fi Show into perspective, the Hilton at the 1994 Summer CES (where the hi-fi is hidden) had half the number of rooms. Sponsored by *Hi-Fi News & Record Review*, the Hi-Fi Show has survived U.K. hi-fi-scene politics to emerge as *the* showcase for new hardware in Europe.

Top Audio, Italy's high-end audio fair held in Milan each autumn, is smaller but of similar vintage and

prestige. Its strength is the wealth of home-grown hardware and the, well, *Italian-ness* of the show. There is no more passionate a breed of audiophile than the Italian variety, which might have something to do with an obsession with opera. Top Audio (like the Hi-Fi Show) is locat-

ed out in the sticks, past the point where Milan stops and no-man's-land begins, but still the crowds arrive to fondle the latest wares. Despite train strikes, a major power failure that also took out half of Heathrow Airport, and the sheer indifference of the British retail sector, the 1994 Hi-Fi Show, held September 8th through 11th, had the highest public attendance yet. It was the first time I had to stop cruising the show during the public days because you simply couldn't get into the rooms. The surprises were plentiful, so those who did struggle with the crowds were amply rewarded.

British shows are, by virtue of taking place in the Home of the Box-Type Loudspeaker, rife with cone-filled enclosures. For whatever reason, the U.K. is teeming with loudspeaker designers, and the shows are repositories of new ideas. Wilson Benesch, a leader in the use of carbon fiber, has expanded its business from tonearms and turntables to include a loudspeaker featuring an enclosure made from the woven wonder material. From the front, the

**LONDON'S HI-FI SHOW IS  
PURE HI-FI WITH JUST  
A SMIDGEN OF HOME  
THEATER—NO NINTENDO,  
NO MOBILE PHONES.**

# UNCOMPROMISED PRECISION



Model

## 920

### Compact Disc Transport

- **FAST ACCESS LOGIC**
- **REMOTE DC POWER SUPPLY**
- **1 OPTIC and 2 COAXIAL OUTPUTS**
- **SINGLE BEAM LASER with GLASS LENS**
- **HIGH SPEED DIGITAL PROCESSING/ ULTRA LOW JITTER**

*Precision disc handling is accomplished by utilizing a single beam "swing arm" drive, along with a metal turntable, for superb mechanical stability. High-integrity data is achieved through the use of advanced logic devices and third generation error detection/correction technology. The result is digital data which contains all the subtleties necessary to yield the most convincing musical experience. We strongly recommend the use of a Polyfusion Model 800 or 900 DAC with this transport.*



*Convenience, the Model 920 employs a drawer rather than a top load mechanism. This allows you to locate your 920 inside equipment cabinets, or stack components without the transport having to be on top. The full function infra-red remote gives total control of all parameters, from the "sweet seat".*

## polyfusion audio

30 Ward Road Lancaster, New York 14086 USA Phone (716) 681-3040 Fax (716) 681-2763

Enter No. 37 on Reader Service Card



**The Italians showed vintage hi-fi gear, mainly from the U.S. and Britain.**

post-holocaust sci-fi flick. Concessions to styling? Blue paint—that's it. But the performance is dynamic, sensitive, and detailed. Whether or not that's enough to compensate for the purely utilitarian styling remains to be

The smallest was probably L.A. Audio's wild little in-car tube amp, while Gamma's catalog listed (but the company didn't show) a model with a price tag not unadjacent to that of a Mercedes 500SL.

Audio Research chose the Hi-Fi Show as the launch site for the VT150SE, the Special Edition version of the company's current flagship. Styled to resemble the D150 of yore, the VT150SE features a faceplate so perfect in its retro-ness that I thought the distributor, Absolute Sounds, had borrowed an original D150 for the show. Also announced was ARC's first tube D/A converter, the DAC 3, which, as luck would have it, turned up at the Top Audio show the following week.

Unison Research wins (again) the Wacky Styling Award for its luscious Smart 845 monoblock, which, broken English name aside, is a genuine show stopper. A pure triode Class-A design, it delivers 24 watts from a single 845 tube and features a ceramic "chimney" to keep the tubes' heat away from the power supply. All Unison Research amplifiers feature real wood accents such as could only have been produced in Italy.

On the solid-state front, TOCA (Touch of Class A) is a new firm manufacturing absurdly large electronics alongside a range of more domestically dimensioned alternatives. So mammoth are TOCA's 300-watt single-ended Class-A monoblocks that I thought I was looking at subwoofers. No kidding—6 feet of amplifier dissipating 1,700 watts while idling. Finished in marble, the amp was conceived for audio crazies who think that \$30,000 for a pair of coffin-sized amps is normal. After TOCA, the most controversial new amp was the Class-A/B monoblock from Dynaudio. Battery-powered, rated at 700 watts into 8

forthcoming speaker looks like a "normal" floor-stander. Look to the sides, and it's a glimpse of the future, the familiar black composite with its highly visible weave forming the cabinet sides. Rogers responded to more than a decade's worth of customer pleading by showing the production version of the AB1 subwoofer for the LS3/5A, a novel solution to marrying that self-contained gem to a boombox without compromising the mid and treble. With the same cross section as an LS3/5A (a mere 7½ x 6½ inches), the AB1 woofer looks like a natural extension of the BBC classic. It works, too. I don't want to cause Rogers any trouble in the U.S. by broadcasting the U.K. price; suffice to say, the AB1 will cost you only 66% of the price of the LS3/5As themselves.

Not that the innovations were exclusively British. Credo of Switzerland demonstrated its intriguing Corona Ion Tweeter, one of those designs that creates a "plasma" of heated air from a high-voltage, high-frequency field, with the air expanding or contracting along with the signal. Visitors to the room were not greeted by any excess ozone. AEON Acoustics unveiled the Patented Tubular Starform Loudspeaker Cone, a driver whose cone is embossed with ridges that increase both the surface area and rigidity while improving the stiffness-to-weight ratio. This technology won the Gold Medal for Best Electronic Development at the 20th Salon of Inventions in Geneva in 1992. Speaker systems containing these full-range, self-damping drivers start at around £1,240 per pair.

And then there's the STD-1 from Heard Acoustics, which is peculiarly British. A combination of titanium cone tweeters, ATC dome midrange drivers, and 8-inch Bandor woofers, the STD-1 has the domestically unfriendly look of a prop from some

seen, but the STD-1 has put the deserving Heard Acoustics on the audio map.

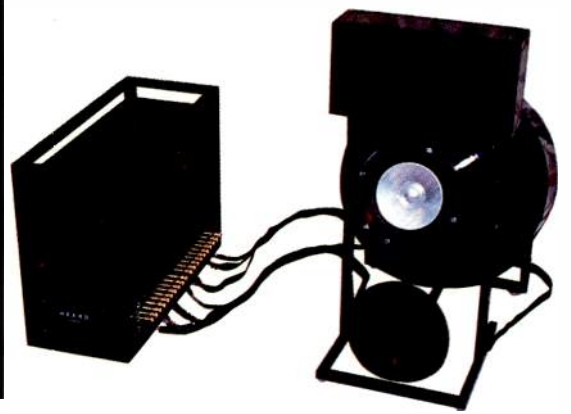
The Hi-fi Show's importance is illustrated perfectly by the world scoop produced when McIntosh's president, Ron Fone, flew over with the mock-up of the forthcoming MCD7009 CD transport. It is based on a

**MOST OF EUROPE IS STILL TUBE-CRAZY, AND THE HI-FI SHOW IN LONDON WAS RICH WITH GLASS.**

TEAC drive and should be ready by the time you read this. But that wasn't all; Fone also unveiled the prototype of McIntosh's new integrated amp and let slip news of a LaserDisc player, the latter probably in time for the Winter CES. The integrated amplifier will be designated the MA6800 and will deliver around 150 watts per channel into 8 ohms. It features full remote control and pre-out facility, and it's pure Mac all the way. Other American manufacturers who made the trip included Dan D'Agostino, launching Krell's KPS series of CD players in the U.K., Neil Sinclair of Theta Digital, and Bill Conrad of conrad-johnson.

Most of Europe is still tube-crazy, and the Hi-Fi Show was rich with glassware: Triodes and pentodes, single-ended designs, balanced designs, kits, budget stuff, and units requiring a mortgage.

**Utilitarian styling and dynamic, sensitive performance mark the Heard STD-1.**





# In The Mid '70s We Created Home Theater. Now We've Created A New Way To Buy It.



The people who work at Cambridge SoundWorks - including our cofounder Henry Kloss (who also founded AR, KLH and Advent) - have been involved with the concept of home theater from the beginning. In 1969 (years before VCRs and cable TV), Henry Kloss founded Advent, the company that introduced the first home theater audio/video systems - complete with big-screen TVs and digital surround sound. We have had an ongoing relationship with the people at Dolby Laboratories, creators of Dolby Surround Sound, since Henry Kloss introduced the first consumer products with Dolby noise reduction over 20 years ago. And now at Cambridge SoundWorks we believe we have set a new price-to-performance standard for home theater components.

Because we sell carefully matched and tested home theater speaker systems factory-direct, with no expensive middlemen, you can save hundreds of dollars. We believe the products on these pages represent the country's best values in high performance home theater components. Audio critics, and thousands of satisfied customers, agree. *Stereo Review* said "Cambridge SoundWorks manufactures loudspeakers that provide exceptional sound quality at affordable prices." *Audio* suggested that we "may have the best value in the world."

## Center Channel Speakers

Cambridge SoundWorks manufactures three speakers for use as center channel speakers in Dolby Pro Logic home theater systems. All three are magnetically shielded so they can be placed near a TV or computer monitor. *Model Ten-A* is a small, affordable two-way speaker. **\$80.** *Center Channel* is identical to a



Cambridge SoundWorks *Ensemble* satellite (but with magnetic shielding). **\$149.** *Center Channel Plus* uses an ultra-low, ultra-wide design that is ideal for placement above (or, with optional support stand, below) a TV monitor. **\$219.**

## Surround Speakers

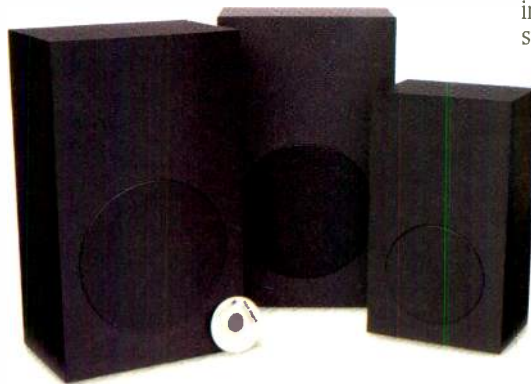
Cambridge SoundWorks makes two "dipole radiator" surround sound speakers. Dolby Laboratories recommends dipole radiator speakers for use as surround speakers.



*The Surround* has a very high power handling capacity and is often selected for "high end" surround sound systems. *Audio*, describing a system that included *The Surround* said, "In many ways the surround sensation was every bit as good as far more expensive installations." **\$399 pr.** The smaller *The Surround II* is arguably the country's best value in a dipole radiator speaker. **\$249 pr.**

## Powered Subwoofers

The original *Powered Subwoofer* by Cambridge SoundWorks consists of a heavy-



duty 12" woofer housed in an acoustic suspension cabinet with a 140-watt amplifier and a built-in electronic crossover. *Stereo Review* said it provides "deep powerful bass...31.5 Hz bass output was obtainable at a room-shaking level... they open the way to having a 'killer' system for an affordable price." **\$699.** Our *Slave Subwoofer* uses the same woofer driver and cabinet, but does not include the amplifier or crossover. It can only be used in conjunction with the *Powered Subwoofer*. **\$299.** The new *Powered Subwoofer II* uses a 120-watt amplifier with an 8" woofer. **\$399.**

Our *EXO-1* electronic crossover can be used with either of our powered subwoofer systems,

or with powered subwoofers made by other companies. Its high pass filters keep strong, low bass signals out of the main stereo speakers, and directs them to the powered subwoofer. **\$299.**

## Home Theater Speaker Systems

We have assembled a number of home theater speaker systems that consist of center channel, surround and main stereo speakers. The



combination we show here is our best seller. It includes our critically acclaimed *Ensemble* subwoofer satellite speaker system (with dual subwoofers), our *Center Channel Plus* and a pair of our best surround speakers, *The Surround*. You could spend hundreds more than its **\$1,167** price without improving performance.

For information on other home theater speaker systems - or on any of the products we make and sell - call 1-800-FOR-HIFI for your free color catalog. Thanks.



For A Free Catalog, Call  
**1-800-FOR-HIFI**

We Know How  
To Make Loudspeakers



154 California Street, Suite 104DEC, Newton, MA 02158  
1-800-367-4434 Fax: 617-332-9229  
Canada: 1-800-525-4434  
Outside U.S. or Canada: 617-332-5936

© 1994 Cambridge SoundWorks. REnsemble is a registered trademark of Cambridge SoundWorks, Inc. KLH is a trademark of KLH, Inc. AR and Advent are trademarks of International Jensen Inc. Cambridge SoundWorks is not affiliated with KLH, Advent or AR.



**CAMBRIDGE  
SOUNDWORKS**  
BY HENRY KLOSS



Includes  
Guide To  
Surround  
Sound

# FREE Audio Catalog

At Cambridge SoundWorks we make speakers and music systems designed by Henry Kloss (founder of AR, KLH & Advent). We sell them—and components from companies like Sony, Pioneer, Philips, Carver and others—factory-direct, with no expensive middlemen. For example, a Dolby Pro Logic Surround Sound system with Model Six speakers, rear speakers, a Sony Pro Logic receiver and remote is only \$747. Call today and find out why *Audio* magazine said we may have “the best value in the world.”

- Call toll-free for factory-direct savings.
- Save hundreds on components and systems from Cambridge SoundWorks, Sony, Pioneer, Philips, Carver and more.
- Audio experts will answer your questions before and after you buy, 8AM-Midnight (ET), 365 days a year—even holidays.
- 30-Day Total Satisfaction Guarantee on all products.
- 7-Year Parts & Labor Speaker Warranty.



Introducing  
The New  
Ensemble II by  
Henry Kloss.  
**\$439**

**1-800-FOR-HIFI**

*We Know How To Make Loudspeakers.*



154 California Street, Suite 1040EC, Newton MA 02158  
1-800-367-4434 Fax: 617-332-9229  
Canada: 1-800-525-4434 Outside U.S. or Canada: 617-332-5936  
©1994 Cambridge SoundWorks.

ohms (and 2,400 watts into 2 ohms), it has a U.K. sticker price of £85,000. Its vertical chassis looks more like a sleek computer than a piece of hi-fi equipment.

As ever, the accessories were the freakiest items to contemplate. With Milan's show only a week away, I was treated to a sneak preview in London of the Italian-made Audio Carpet from Aedon Audio, which is just what it says it is: A carpet. It is supposed to, and I quote, “. . . improve the acustical (sic) features of the especially (sic) with higt (sic) quality levels of audio reproduction.” It reads a whole lot better in Italian. I love it, because it looks like a Versace shirt. Give it time, and I'm sure it will reveal sonic properties.

Perhaps the most impressive accessory of all was an entire concept. Michael Green Designs made its U.K. debut with a whole system consisting of the famous sloped

**YOU WILL FIND NO MORE  
PASSIONATE A BREED OF  
AUDIOPHILE THAN THE  
ITALIANS, PERHAPS DUE  
TO THEIR LOVE OF OPERA.**

speakers, the BL-2 line stage and the A150S power amp, and the full range of Audio-Points mechanical grounding devices, RoomTunes, and ClampRacks. More than one audiophile/*Hi-Fi News* reader stopped to tell me that MGD had the most comfortable, nicest sounding room at the show.

After all of the Italian previews in London, was Milan's Top Audio an anticlimax? No. The Italians saved plenty for their own show (located in the Quark Hotel from September 15th to 19th) along with scoops like the aforementioned Euro debut of the Audio Research DAC-3. Most impressive were two almost uniquely Italian aspects of the show.

The first was the absolutely breathtaking selection of vintage hi-fi equipment, almost entirely British and American, sponsored by the magazine *Audio Review*. Choice items from McIntosh, Radford, Leak, Marantz, Quad, Rogers, and the like attracted crowds around the imaginative display throughout the show. The second? What amounts to an Italy-only revival in kit-building. Nearly every hi-fi magazine

**Not a  
computer,  
it's Dynaudio's  
battery-  
powered  
Class-A/B  
700-watt  
monoblock  
amplifier.**



sells kits or publishes designs (or, in one case, provides free hi-fi designer computer programs in the form of a cover-mounted floppy disk) for tube electronics or speakers. And the stuff looks great, a far cry from the funky junk you'd expect of solderheads.

A couple of wild debuts will stick in the memory, including the first truly new tube since the dawn of the transistor, the VV30B. And what the hell is a VV30B, you might be wondering? Simple: It's a Czech-made drop-in replacement for the 300B, a tube that is at the heart of the current single-ended triode craze. As 300Bs are fragile, noisy, and rare (at least, the genuine Western Electric ones are), the demand existed for a better alternative. Manufactured by a company called VAIC, the VV30B betters the 300B in every way, but expect to pay a heart-stopping \$480 per tube.

Another eye-opener was the mock-up of Jeff Rowland's new top-of-the-line preamp, The Consummate, with emphasis on the “The.” Looking truly as if it were carved from solid aluminum, the unit's front-panel controls pull away to serve as a remote control. Sure, if you bench-press 250 pounds on a daily basis! Entry into the unit is strictly via balanced inputs, and the price will probably have credit card companies grinning from ear to ear.

In case you think that the roster in the beginning of this report is all that lay in store for the intrepid audio explorer, note that, before Christmas, shows will be held in Portugal, Hungary, and mainland China. And those are just the ones I know about. Then it's CES time again. In case you think that the collective hi-fi imagination is running dry, forget it.

Mondo Audio, indeed.

A



# How Do You Improve On "The Best Value In The World"?

## Cambridge SoundWorks Introduces *New Ensemble*, *New Ensemble II* – and a new member of the family, *Ensemble III*.

*Audio* magazine once said our *Ensemble*® speaker system may be "the best value in the world." Since then, numerous critics have applauded our *Ensemble* and *Ensemble II* systems. Designed by Henry Kloss (founder of AR, KLH and Advent), they became best sellers by offering quality construction and accurate, wide-range music reproduction — at factory-direct prices.

We're pleased to introduce new versions of our *Ensemble* and *Ensemble II* systems, as well as our new, ultra-compact *Ensemble III*.

### The New *Ensemble*

*New Ensemble* is an improved version of our original dual-subwoofer/satellite speaker system. *New Ensemble* maintains the dual subwoofer design, which allows for maximum room placement flexibility. Placement of bass and high-frequency speakers in a room (and how those speakers interact with the room) has more influence on the sound quality of a music system than just about anything. *New Ensemble's* ultra-slim (4 1/2") subwoofers give you more placement flexibility than any system we know of.



### So What's New?

*New Ensemble* maintains the tonal balance, frequency range and quality of construction of the original. There are two basic differences.

1. *New Ensemble* uses a new 8" woofer with a very long "throw" for linear cone excursion and more accurate bass. An integral heat sink provides improved power handling.

2. *New Ensemble's* satellite speakers use the same speaker drivers and crossover as the original, but with new midrange and high frequency balance controls.

The midrange control lets you choose the same output in the key 800-1600 Hz octave as in the original, or you can emphasize that octave by 2 dB. *Ensemble* satellites have relatively less output in this range to avoid the "boxy" sound typical of many speakers. This results in an "open" sound on large-scale symphonic works. For small-scaled music, the higher output position proves a "warmer" sound.

A high frequency control has three positions: A) The same balance as original *Ensemble*. B) A 2 dB high frequency increase. C) A 2 dB high frequency decrease. The switch can subtly increase the system's "airiness" (Increase) or it can reduce any tendency towards "edginess" (Decrease).

In terms of "real life" performance, we believe our *New Ensemble* system competes head-on with speakers selling for hundreds more. Available with black-laminate subwoofers for \$629, or with vinyl-clad subwoofers for \$549.

### The New *Ensemble II*

*New Ensemble II* is an improved version of our best-selling speaker system. It's more affordable than *New Ensemble* because it uses one cabinet to house both subwoofer speakers. *New Ensemble II* maintains the tonal balance, frequency range, power handling and construction quality of the original *Ensemble II*. But its satellite speakers use the same tonal balance controls as *New Ensemble's*.

*New Ensemble II* also uses a new flared subwoofer port. The subwoofer cabinet encloses two 6 1/2" long throw woofers mounted in a sealed "acoustic suspension" chamber. They project into a second chamber fitted with the flared port, which provides smoother air flow, eliminating extraneous noise on strong bass notes.

*Stereo Review* said the original *Ensemble II* "performs so far beyond its price and size it can be compared only with much larger speakers at substantially higher prices." *New Ensemble II* carries on this tradition, outperforming other speakers in its category, including well-known models for about twice the price. Factory-direct price, \$439.

### The *Ensemble III*

Now you can bring the clear, balanced wide-range sound of *Ensemble* speakers to a small, crowded room. Our new *Ensemble III's* satellite



speakers are only 4 1/2" x 6 1/2" x 3" and its subwoofer is 8" x 8" x 15".

Compared to *New Ensemble II*, *Ensemble III* gives up a little in power handling, low bass range, and efficiency. Unlike the "cube" satellite speakers you'll find in most similarly priced systems, *Ensemble III's* satellites are two-way speakers. *Ensemble III's* 6 1/2" woofer uses two voice coils in a cabinet with a flared port for smooth air flow.

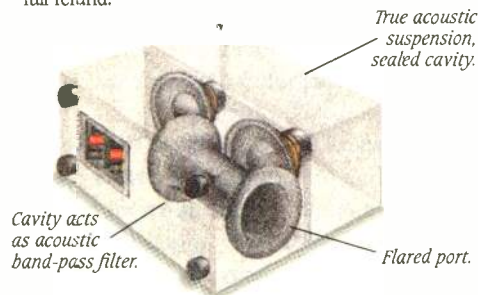
With most recordings *Ensemble III* will sound virtually identical to *New Ensemble II*. It simply won't play as loud. Its construction quality is normally found only in much more expensive speakers.

Factory-direct price, including connecting wire, cutter/stripper and Hook-Up Guide, is only \$329.



### 30 Day Home Audition.

All Cambridge SoundWorks speakers are backed by a 30-Day Total Satisfaction Guarantee. So you can audition your speaker the *right way* — in your home, with no salesman hovering nearby. If within 30 days you're not happy, return your system for a full refund.



For A Free Catalog, Call  
**1-800-FOR-HIFI**

We Know How  
To Make Loudspeakers!



154 California Street, Suite 104DEC, Newton, MA 02158

1-800-367-4434 Fax: 617-332-9229

Canada: 1-800-525-4434

Outside U.S. or Canada: 617-332-5936

© 1994 Cambridge SoundWorks. © Ensemble is a registered trademark of Cambridge SoundWorks, Inc. KLH is a trademark of KLH, Inc. AR and Advent are trademarks of International Jensen Inc. Cambridge SoundWorks is not affiliated with KLH, Advent or AR.



### Classical Master Responds

Dear Editor:

I am extremely pleased with the outcome of my "Audio Interview" in the September issue. I was able to express my views on technology becoming the means rather than the end of recording classical music. I am grateful to you and to Don Fostle for having made this possible. We probably will get some flak from the gold-connector guys. Well, so be it.

Marc Aubort  
Elite Recordings  
New York, N.Y.

### Classical Master's Vinyl "Mastercuts"

Dear Editor:

I enjoyed your interview with Marc Aubort in the September issue. It was a fascinating glimpse at the procedures and thought processes that have produced so many fantastic and, indeed, legendary performances over the years.

Your readers may be interested to know that five of Mr. Aubort's classic recordings are available on HQ-180 vinyl from Reference Recordings, as Reference Mastercuts reissues. These include performances of Ravel by Stanislaw Skrowaczewski and the Minnesota Orchestra, and of Rachmaninoff and Gershwin by Leonard Slatkin and the Saint Louis Symphony.

Readers should also note that the recording of Prokofiev's *Alexander Nevsky* mentioned in the article seems to have been credited to us by mistake; it is not a Reference Recordings release, but I don't know whose product it is. Caveat emptor, and thank you for allowing us to make this correction.

Rik Malone, Operations Manager  
Reference Recordings  
San Francisco, Cal.

*Editor's Reply:* The recording in question is on Athena (ALSY 10003) and is available through East Music Distributors (311 Willowbrook Rd., Staten Island, N.Y. 10314).—D.H.

### Whither Whyte's Stereo Tapes?

Dear Editor:

I was greatly interested in David Hall's letter in the September issue, wherein he writes of Bert Whyte's experimental stereo taping of the Rafael Kubelik performance of Smetana's "Ma Vlast" simultaneously with Mercury's mono pickup. This is one of the classic Mercury recordings.

I also recall Whyte writing in his column some years ago about making stereo tapes of a number of Paul Paray performances released on Mercury only in mono, including the Rimsky-Korsakov "Antar" Symphony. This, of course, raises the question—left hanging in Hall's letter—of whether these and other such stereo "trial runs" resulted in viable recordings that may be released on Mercury CD in place of the mono versions. Did Whyte share these tapes with Wilma Cozart, or does Hall plan to do so now? There are many people who refuse to buy anything in mono, no matter how good it sounds. If stereo tapes of these Kubelik and Paray performances can be used for the CDs, this will be wonderful news for the hopeful collector. After all, it was RCA's belated stereo release of the Arthur Rubinstein/Fritz Reiner First Piano Concerto of Brahms, the Reiner "Symphonia domestica" of Strauss, and the first Charles Munch "Symphonie fantastique" of Berlioz many years after the original LP that served to disprove the notion that no stereo sound of consequence was being recorded in those early days.

Steve Haller  
Oak Park, Mich.

### Digital Film Sound

Dear Editor:

In his article "Digital Film Sound: Rated S for Sound" (June), E. Brad Meyer mentioned the "rapid and sometimes irregular motion" of film through a projector. Be informed that where the sound is scanned on a projector, the film is absolutely steady; it's not irregular.

By the way, dialog recording does not require a frequency response wider than 100

Hz to 8 kHz. The advantage of digital will be the greater volume range (for shouting and screams).

If anyone wants to hear good dialog recording, see and hear the 1942 film *Casablanca*.

Charles A. Schmitz  
Canal-Winchester, Ohio

*Author's Reply:* Mr. Schmitz is right that the start-stop motion in the gate, where the image is projected, is not present in the part of the film's path where the sound is read. But even at the sound head—or in a digital reader—the film's motion is rapid (18 inches per second) and much more irregular than that of, for example, the tape in a magnetic recorder.

Movie dialog contains frequencies that extend well beyond 8 kHz and whose removal would be audible. But the big demands on any film sound system have always come from music and sound effects, so it is in these areas that the digital systems make the biggest difference.

I was not aware that the film *Casablanca* had an especially well-recorded dialog track, but I will rent the LaserDisc and listen.—E.B.M.

### Sony TCD-D7: On Site and Outta Sight

Dear Editor:

I certainly enjoyed the "Equipment Profile" by Leonard Feldman and Ivan Berger of the Sony portable DAT recorder (June). I purchased my TCD-D7 in March 1993 and have since used it for eight on-site recording sessions.

Perhaps because I began recording in 1963 with a 60-pound Revox G-36 MkII open-reel tube tape recorder that used awkward 10½-inch reels, I appreciate the tiny, pocket-sized TCD-D7 with its 1-pound weight even more.

To keep live recording sessions simple, I purchased a high-quality stereo microphone with two adjustable omni pickup capsules in a single housing, the AKG C522 ENG. I followed the rule of paying twice as much for the mike as for the recorder, and it certainly was worthwhile. After all, the quality of the output cannot be any better than that of the input. The mike has an internal rechargeable battery, good for 150 hours with a single charge. The low noise

# All tube. All affordable. All yours.

If you appreciate the natural-sounding reproduction of music made possible by vacuum-tube technology—but were afraid of the hassles and the prohibitive price—have we got news for you. Audio Research, the 25-year leader in vacuum-tube technology dedicated to music reproduction, has made a vacuum-tube music system more affordable than ever. It's the New LS7 stereo line preamplifier and VT60 stereo power amplifier, both featuring new, all-tube circuits that deliver rich, satisfying sound and world-renowned Audio Research construction. Two down-to-earth audio components that are capable of truly out-of-this-world performance.



## audio research

H I G H D E F I N I T I O N<sup>®</sup>

5740 Green Circle Drive / Minnetonka, Minnesota 55343-4424 / Phone: 612-939-0600 FAX: 612-939-0604

Enter No. 3 on Reader Service Card

and wide frequency response of both the mike and the DAT recorder make them ideal for on-site recording.

Taking the Sony on the road is a simple process: I set up the single folding mike stand, insert the mike, and run its 15-foot unbalanced cable with an 1/8-inch stereo mini-plug to the Sony, which can sit on the stage. For battery-powered operation, this is the only cable needed. If a.c. power is available, I use the wireless remote controller. If not, I just set the recording level and let it run. I agree with Mr. Feldman that the manual level adjustment is better than the automatic gain control, without compressing the sound. I leave the Sony's internal light on so I can see the timing readout and verify the record mode.

Drawbacks: The record level is not adjustable from the optional wireless remote. Further, the red numerals on the black record level control lack sufficient contrast in dim light; white numerals would have been better. I join Mr. Berger in his disappointment that the Sony engineers have chosen a nondefeatable bass attenuation (down 3 dB at 20 Hz) through the microphone input without notifying the customer; as he observed, it's not noted in the manual.

The sheer pleasure of making a high-quality recording (48-kHz sampling rate) on a tape that lasts for two hours without turning it over, run by four AA batteries that last for four hours, must be experienced. And for security during intermission at live recording sessions, I merely unplug the DAT recorder and stick it in my pocket—it's that small!

The portability and simple setup take the drudgery out of live recording. I had great success with my July 1 on-site recording of 10 members of the Philadelphia Orchestra playing German band music at the Music Pier in Ocean City, New Jersey. Upon hearing the playback on a high-quality audio system, one musician remarked that the DAT captured the realism of the sound.

One feature not noted in the review is the provision for unattended recording using an external timer with the remote. Four hours of FM can be recorded (at the 32-kHz sampling rate) with FM-broadcast sound quality.

Charles M. Edwards  
Cherry Hill, N.J.

## "Hiss-Free" No Longer Means "Destructive"

Dear Editor:

This is in response to Bruce and Jenny Bartlett's article "Classic Jazz Remasters" (July), particularly Mark Wilder's reference to reducing tape hiss. I have been remastering analog masters for reissue on CD since the mid-1980s for Angel and Capitol, as well as for custom clients. In the beginning, the attempts to make CDs hiss-free were, as Mr. Wilder states, destructive. But this situation did not last long, as least here at Capitol.

The idea of remaining true to the sound of the original master tapes is an appealing one and, of course, requires that the tapes be transferred flat, hiss and all, with no processing whatsoever. The resulting CD will sound just like those master tapes (assuming state-of-the-art A/D conversion and proper dithering), but why should it? The problem is that most tape recordings made in the 1950s and '60s sound rather



dated today, and virtually all of them can be improved. Most were mixed and equalized with the vinyl end-product in mind, and many were mixed to sound good on AM radio. Even when they weren't, the mono mix usually had priority over stereo.

Our philosophy of what has come to be called "digital remastering" is probably somewhat unique. Rather than being true to the original recording, we try to be true to the original *performance*. And it is quite obvious that tape hiss is a distortion of that performance. (For that matter, *mono* is a distortion of that performance: The musicians were not all in the same spot. But mono is better left that way. We don't fake stereo anymore.) Severe hiss can be substantially reduced, and normal hiss can be subjectively eliminated without noticeable side effects. The key words are "subjectively" and "noticeable"—and if some readers take issue with that statement, they will really gag on this one: Not only is it possible

to retain high frequencies and "air" while doing this, they actually can be *increased*.

I routinely remove the hiss in two steps: About half is removed in the analog domain while transferring into the digital workstation, and the other half is removed in the digital domain in the computer. The reason for this two-step process is that both de-hissing methods have their own unique side effects. The analog system, part of which I developed, pumps and dulls; the de-hiss algorithm in the computer swishes. These effects can be heard if I try to eliminate all the hiss with one system. However, because the side effects of the two systems are different, going only halfway with each renders those side effects inaudible.

Then, in two separate steps, high frequencies that were lost in the de-hissing process are reinserted into the program—again by two different methods, neither of which involves bending the response curve, as in traditional equalization. My studies in psychoacoustics come in handy at this point, and I take advantage of the way the human ear hears "brightness" (nature can bend a curve downward but not upward).

These comments are probably controversial, and some purists will consider them nothing more than hype, so I invite the doubters to sample the finished products. Listen to the reissues in the Broadway Angel series or the Capitol Sings series (the ones with my name on them). A Big Band set and the first of the "Spotlight On . . ." releases will be issued soon.

Of course, some source material is so bad that any attempts to improve it, no matter how judicious, will only make it worse. In that case, it is always better to simply leave it alone and transfer as is. But I have found that probably 98% of recordings made from the mid-1940s through the 1970s can be improved by the careful application of the above techniques.

Bob Norberg  
Capitol Records  
Hollywood, Cal.

## "A Lot of Dead Formats"

Dear Editor:

Regarding John Eargle's August "Currents," it would be a very hazardous guess that future LaserDisc players will play today's discs. There are a lot of dead formats. Clearly, interactive materials and players

# THE WAY THESE GUYS ARE TALKING, MAYBE WE SHOULD RAISE THE PRICE.

**"For the first time in 20 years,  
an affordable product that  
sounds like music."**

Larry Schnelle  
AP-5 owner  
Manchester, MO

**"The best I've heard under  
\$6000."**

Mark Shale,  
AP-2 owner  
Richmond, KY

**"Blown away by them..."**

Speight Bird, Jr.  
AP-2 owner  
Athens, TN

**"Greatest product since stereo  
was invented."**

Mark Fitzsimmons  
AP-2 owner  
Richmond, TX

**"Awesome! Flawless! Real!"**

Eric Keller  
AP-4 owner  
Wheeling, WV

There was a time when DIGITAL PHASE systems were available only through the most exclusive audio salons. Today, the same systems are offered factory-direct, and at the greatly reduced prices that implies.

But the way these guys are talking, maybe we should raise the prices and go back to the *old* way of doing things.

Well, we don't because there's nothing *old* about DIGITAL PHASE.

There's the *new* and patented Acousta-Reed™ technology for bass depth and definition at a level never before realized. There's the *new* one-piece dome tweeter of spun titanium for unparalleled sweetness in the highest of frequencies. And then there's the *new* way of doing business: factory-direct.

Yet with all that's *new*, we have an *old*-fashioned promise, one better than at most places you shop. If you don't like what you hear, return it in 30 days for your money back.

So call us today while the sound is great and the price even greater on the all *new* DIGITAL PHASE.

 **Digital Phase™**  
ACOUSTA-REED TECHNOLOGY™



**For factory-direct pricing, call 1-800-554-7325**

Prices per pair: AP-5 (bookshelf), \$449 • SM-1, \$649 • AP-1, \$899 • AP-2, \$1199 • AP-4, \$2199. Pictured, AP-1 in oak.  
VISA, MC, AMEX accepted. For more info, call toll free or write P.O. Box 22813, Chattanooga TN 37422

Enter No. 16 on Reader Service Card

have a way to go. Personally, I have a disc for which I have never even seen a player to put it in!

These deaths make me nervous about buying things like MD and DCC. Laser Discs could easily be killed off by IBM's multi-layer disc mentioned in Ivan Berger's "Spectrum" on the next page! Hogwash? The read/write optical drives are not yet commonplace, and hard-drive densities already rival them.

Allan Gartner  
Charlotte, N.C.

## Taking Stock of Audio

Dear Editor:

As a subscriber to *Audio* since 1962 and an audio enthusiast since I was a young boy, I would like to take this opportunity to tell you some personal thoughts about the magazine. It is worth mentioning that I still keep my complete collection of more than 30 years of *Audio* (well, almost complete, as some issues here and there were lost in the mail and I never could find out if, and where, a back-issue service existed). I very much enjoy glancing through some

of the most interesting articles that appeared in the old issues.

It is obvious that in 30 years, many things have changed, and anybody could imagine not keeping pace with a continuously evolving world. Indeed, *Audio* has greatly improved in style, photography, pagination—and all that should be commended. The content, however, has changed and is not in the spirit of the original magazine. Too little space is left for technical articles, construction projects are practically no longer published, and much space is devoted to interviews with singers, producers, art directors, and so on (too much, in my opinion, for topics that have very little or nothing to do with high-quality audio and that are the main subject of dedicated magazines).

I would like to continue to see *Audio* as the reference magazine for the hi-fi population, as it used to be back when it was the official publication of the Audio Engineering Society. I wish that under your direction, the magazine could steer and find the lost road.

Ing. Enrico Figurelli  
Rieti, Italy

*The Editor-in-Chief's Reply:* Thank you for your interesting letter, and congratulations on your collection. Let us know which issues are missing, and we'll see if we can't find them for you. We do have a back-issue service, but notice of it is in tiny type in the last pages of the magazine.

I agree with you about many things changing over the 30 years you've been a subscriber, though I disagree with you about the magazine not keeping the original spirit. While I would like to have more room for technical articles, it appears more important that we give over as much space as possible to our "Equipment Profiles." Quality construction projects are very tough to get these days, largely because of changes in the nature of the equipment. However, I would be interested in any ideas for projects you would like to see.

One thing I strongly disagree with you about: We've not done any interviews of singers, art directors, or producers who are just producers. I think you mean the interviews of people who have been instrumental in doing quality recordings or establishing quality record companies. One other

AUDIO/DECEMBER 1994

30

# WE PLAY TO RAVE REVIEWS!

"The PSB Alphas are simply one of the greatest buys in audio, providing a musically satisfying sound for a paltry \$200 ... For their price, the PSB Alphas are a sensational audio bargain. Now get out those checkbooks!"

Jack English, *Stereophile*,  
Vol. 15, No. 7 (July, 1992)



**psb**  
SPEAKERS

**A UNIQUE VOICE IN  
THE CROWD**

For your nearest PSB dealer call TOLL FREE 1-800-263-4641

Enter No. 38 on Reader Service Card





# With Cinema DSP, you'll be amazed at what comes out of the woodwork.

Bats screech overhead. Wolves howl in the distance. And footsteps crunch across your living room floor.

No, it's not your imagination. You're hearing sounds placed around the room, just as the director intended.

All courtesy of Yamaha Cinema DSP. The home theater technology that gives dialogue more definition. Music, more dimension. And sound effects, more graphic detail.

Only Yamaha Cinema DSP creates phantom speakers that fully replicate the experience you get in multi-speaker movie theaters. It sounds so real, in fact, you'll swear you hear sounds in places you don't even have speakers.

As you might imagine, a breakthrough like this is no small feat. It's accomplished by multiplying the effects of Digital Sound Field Processing and Dolby Pro Logic.<sup>®</sup>

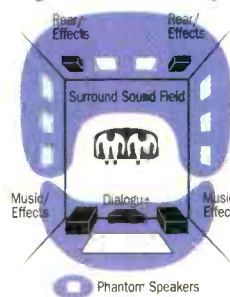
Digital Sound Field Processing is Yamaha's unique technology that electronically recreates some of the finest performance spaces in the world. And Dolby Pro Logic is the technology responsible for placing sound around the room, matching the dialogue and sound effects with the action on the screen.

Together, these two technologies allow Yamaha to offer a complete line of home theater components that outperform other comparatively priced products on the market.

Stop by your local Yamaha dealer for what could be a very eerie demonstration. Maybe we can't talk you into a system, but that doesn't mean we can't scare you into one.

For the sales location nearest you, call 1-800-4YAMAHA.

**CINEMA™  
DSP**



*Only Yamaha Cinema DSP creates phantom speakers. It sounds so real, you'll swear you hear sounds in places you don't even have speakers.*

**YAMAHA®**



item: We never were the official publication of the Audio Engineering Society, though the Society did establish itself because of some letters we published before you started your collection. We have, of course, reprinted many AES papers.

Again, thanks for your comments.—E.P.

### Wanted: Short-Wave for the Car

Dear Editor:

The airwaves are full of wonderful programs from other countries on short-wave. They're easy to receive with inexpensive ra-

dios from a variety of manufacturers. Why don't car radios allow for them?

At home, I enjoy superb programs (in English!) from Great Britain, the Netherlands, Germany, Russia, and other countries: Music, science, poetry, documentaries, comedy, commentary, lots of news—and no commercials! My moderately priced Sony ICF-2010 portable picks all this up indoors with pushbutton ease, and with just its attached whip antenna.

When I look for similar abilities in a car radio, I am stymied. There is one unit with

several short-wave bands along with AM, FM, and cassette. But it does not have the important feature called "synchronous detection with selectable sidebands"—technically Greek, but just another pushbutton on the Sony—which makes the sound so much steadier and clearer. Nor does the car unit's cassette player have Dolby noise reduction, which again is a necessity. The unit is being discontinued and its replacement will have CD instead of cassette, but its short-wave coverage will be reduced to one band—and still will be without synchronous detection.

The American market supports lively sales of short-wave radios ranging in price from \$100 to \$6,000. (Even Radio Shack has a line.) Surely we could support healthy sales of short-wave car models, too, if their fundamental performance and features were right for this country.

Manufacturers, awaken!

James Boyk  
Los Angeles, Cal.

The Editor-in-Chief's Reply: And in the home too!—E.P.

### Blank Media Prices

Dear Editor:

A little advice for Sony and Philips. If they want MD or DCC to succeed, all they have to do is lower the price of their blank discs or tapes. That's why I won't buy one. There is no good reason for blank media to be so expensive. You can record in digital on 8 mm, yet a blank 8-mm tape costs one-half to one-third of what an MD, DCC, or even DAT costs.

Richard Puqzal  
Tucson, Ariz.

### Erratum

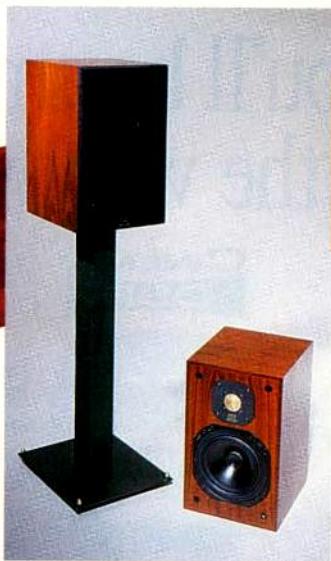
Dear Editor:

Regarding Anthony Cordesman's "Show Business" column in the July issue, there is a brief reference to Dolby Laboratories on page 30 that should be corrected.

The Core Group (as mentioned in the article) is merely the distributor of Dolby Laboratories' video, *Consumer Guide to Home Theatre*. The Core Group is not owned by Dolby.

Bryan Stanton, President  
J.B. Stanton Communications  
New York, N.Y.

## GOLD A SOUND INVESTMENT



MA700 Gold MK II

Monitor Audio's commitment to quality reflects in this simple 2-way design. The MA 700 Gold MK II size gives no hint of the large and lifelike sound stage that it is capable of presenting. Monitor Audio's *Gold Dome Tweeter* technology coupled with *Monitor's special compliant woofer with Nitrile surround*, combine to accurately reproduce everything from the subtle nuances of classical guitar to the thunderous roar of Home Theater.



THE MONITOR AUDIO  
GOLD DOME HIGH  
FREQUENCY DRIVER.



CUT-OUT SECTION  
OF THE UNIQUE  
ALUMINUM/MAGNESIUM  
METAL CONE WOOFER  
AS USED IN  
STUDIO SERIES.

DESIGNED AND  
MANUFACTURED IN  
ENGLAND

CABINETS ARE  
PAINSTAKINGLY  
CONSTRUCTED BY  
CRAFTSMEN.



**MONITOR  
AUDIO**

Cambridge, England

Monitor Audio USA P.O. Box 1355, Buffalo, N.Y. 14205 Monitor Audio Canada 902 McKay Road, Pickering, ON. L1W 3X8

Tel: (905) 428-2800 Fax: (905) 428-0004

AUDIO/DECEMBER 1994

32

## Movie Theatre Performance with Flexibility

### The Bryston 8B THX® Amplifier



8B THX

**B**ryston is pleased to announce our new 8B THX four channel audio power amplifier. With today's interest in quality home theatre the 8B THX amplifier provides state-of-the-art performance with the unquestioned quality, value and **R**eliability for which Bryston has gained an international reputation. All Lucasfilm Home THX certification parameters are easily met for its' intended use within a multi-channel audio/video installation. The 8B THX is an extremely versatile and flexible amplifier designed for all **Y**our THX theatre installations. The amplifier can be instantly connected to provide 2 channel, (400 watt output), 3 channel, (two @ 120W plus 1 @ 400W), or 4 channels at 120 watts output. This provides extreme ease in integrating the power requirements for any THX Home Theatre system. The THX stipulation for separate center channel, left and right main speakers, decorrolated dipole surround channels and one or two subwoofers, is provided in a **S**imple elegant package. Among the 8B's notable features is the use of four independent power supplies, one for each channel, to prevent any signal interaction among the individual channels. This provides a sonic soundstage with images locked in position with an almost holographic effect. Other features include both balanced XLR, 1/4" and unbalanced RCA input connectors to allow for flexibility in a wide variety of installations. All connectors throughout the amplifier are gold plated to provide freedom from corrosion, assuring perfect signal integrity for many years to come. **T**ri-colored LEDs glow green for power-on, yellow for short-term transient clipping and red to indicate continuous overload or any departure from linearity, including shortened-output or strong out-of-band information like RF or DC. **O**viously, the goal of all this technology is to transport you to the scene of the movie. Experiencing all the drama, excitement and emotions as if you were right there in the show. We feel we have accomplished this with all the **N**ew Bryston THX amplifiers. Experience the movie as intended and audition the Bryston 8B THX today.



For more information contact:  
57 Westmore Dr., Rexdale, Ontario, Canada M9V 3Y6  
Tel: (416) 746-1800 Fax: (416) 746-0308

Enter No. 4 on Reader Service Card



20

Year

Warranty

- A

Generation

of

Music

### General System Wiring

**Q** *What is the difference between a balanced XLR connector and an unbalanced RCA connector? What are the advantages, limitations, and special uses of each?*

*In another matter, my loudspeakers are quite far from my electronics. Including vertical distance and cables run under the floor, the total cable length is 40 feet or more for each loudspeaker. Is it better to run speaker cables over this distance, or should I put the amplifier near the speakers and run long interconnecting cables between the preamp and amp? And should I be using larger speaker wire than the 16-gauge lamp cord I'm now using?*—Richard Clark, Philadelphia, Pa.

**A** Usually, XLR connectors are used for balanced connections and RCA phono jacks for unbalanced. There are exceptions: RCA jacks can be used in pairs for balanced connections (which also lets you change signal polarity, according to which jack in the pair you use), and I have seen a couple of components that used XLR jacks for unbalanced connections, probably to take advantage of the XLR connectors' ruggedness and ease of insertion and removal.

Systems using balanced circuits pick up less hum and noise through their cables. This makes them a necessity in places like broadcast and recording studios, where cable runs are long and there's lots of electronic equipment around to radiate noise. Lately, critical audiophiles have also adopted balanced connections. Because of the relatively high signal levels and low output impedances of preamplifier outputs, CD players, and such, the less expensive, unbalanced, arrangement works fine—even if you run long cables. I use it in my studio/lab all the time. So I suggest that you put the amplifier close to the loudspeakers and run long audio cables rather than long loudspeaker cables.

Keeping the loudspeaker cable runs short saves money on the wire used and also helps maintain high damping and good control of cone movements. You will notice the "tighter" bass.

Your 16-gauge lamp cord is definitely too light for a 40-foot cable run, but you might be able to use that gauge when the loudspeakers are located next to the amplifier. If the impedance of the loudspeakers is 4 ohms, I would use at least 14-gauge wire.

### Tonearm Tracking Force

**Q** *How can you tell, by listening, if a phonograph tonearm's tracking force is set too high or too low? What can be done to adjust tracking force on a tonearm that has no adjustments for this?*—Tom Grace, Ventura, Cal.

**A** Chances are that you won't hear any deterioration in sound quality when the tracking force is set too high. You will, of course, increase record wear.

If the tracking force is set too low and if the disc is heavily modulated (recorded with lots of signal level), you will hear "tracing distortion," especially on "S" sounds or cymbals. Without sufficient tracking force, the stylus tip loses contact with the groove walls and can no longer follow the wiggles of the recorded signal. This can also increase record wear, because the intermittent contact between the grooves and the stylus causes damage. It is better to use a bit too much tracking force than too little.

The maker of a given phono cartridge will usually indicate a range of recommended tracking forces. I feel it is often best to use just a tad more force than the minimum, and others suggest using a tad less than the recommended maximum.

The tonearms I've encountered that don't permit adjusting the tracking force were designed to hold either a specific make and model cartridge or a class of cartridges weighing some specified number of grams.

If you have such an arm and know that the tracking force is too light when used with your present cartridge, place a penny on the arm. By adjusting the penny's position along the length of the arm, you have a crude means of adjusting the tracking force. I have done this, and it works fine.

If the tracking force is too heavy, try adding weight to the rear counterbalance. If you can't do that, try trimming material from the front of the arm, as near the stylus end as possible—often, the headshell can be trimmed a bit. In some cases you may be able to attach a small spring between a point on the arm behind the pivot and a point on the bearing assembly below the arm.

### VHS Linear and Hi-Fi Tracks

**Q** *Suppose I have recorded a videotape as a conventional mono program, using the linear audio track. What will happen when I play this tape on a VHS Hi-Fi machine and engage the Hi-Fi sound mechanism? Will the audio on the linear track be converted into an FM signal?*—Steven Matthews, Louisville, Ky.

**A** If you play a conventional videotape, made on a monophonic VCR, on your VHS Hi-Fi machine, nothing will happen when you press the Hi-Fi button. The recorder will realize that this is a conventionally recorded tape, with no FM subcarriers, and will remain switched to the linear track. This is done so that a Hi-Fi machine can play any videotape.

The purpose of the switch is not to make Hi-Fi sound magically appear from non-Hi-Fi tapes but to inhibit the Hi-Fi tracks from being played. It's used if there's a problem with the Hi-Fi tracks or if the linear track carries different material, such as tracks overdubbed after the tape was first recorded.

### Preamp and Amp Compatibility

**Q** *I wish to connect my receiver's preamplifier output to the input of an external power amplifier. However, my external amp is Class A, and the one in my receiver is Class B. Is this going to create difficulties?*—Chris Chiang, Chicago, Ill.

**A** All that matters is that your preamp output is able to supply sufficient signal to drive your power amp to full power output. If there is a small amount of

---

If you have a problem or question about audio, write to Mr. Joseph Giovanelli at AUDIO Magazine, 1633 Broadway, New York, N.Y. 10019. All letters are answered. In the event that your letter is chosen by Mr. Giovanelli to appear in Audioclinic, please indicate if your name and/or address should be withheld. Please enclose a stamped, self-addressed envelope.

reserve signal, so much the better. Your power amplifier's class of operation is immaterial; the preamplifier in your receiver cannot know and does not care what kind of circuitry is in the power amp.

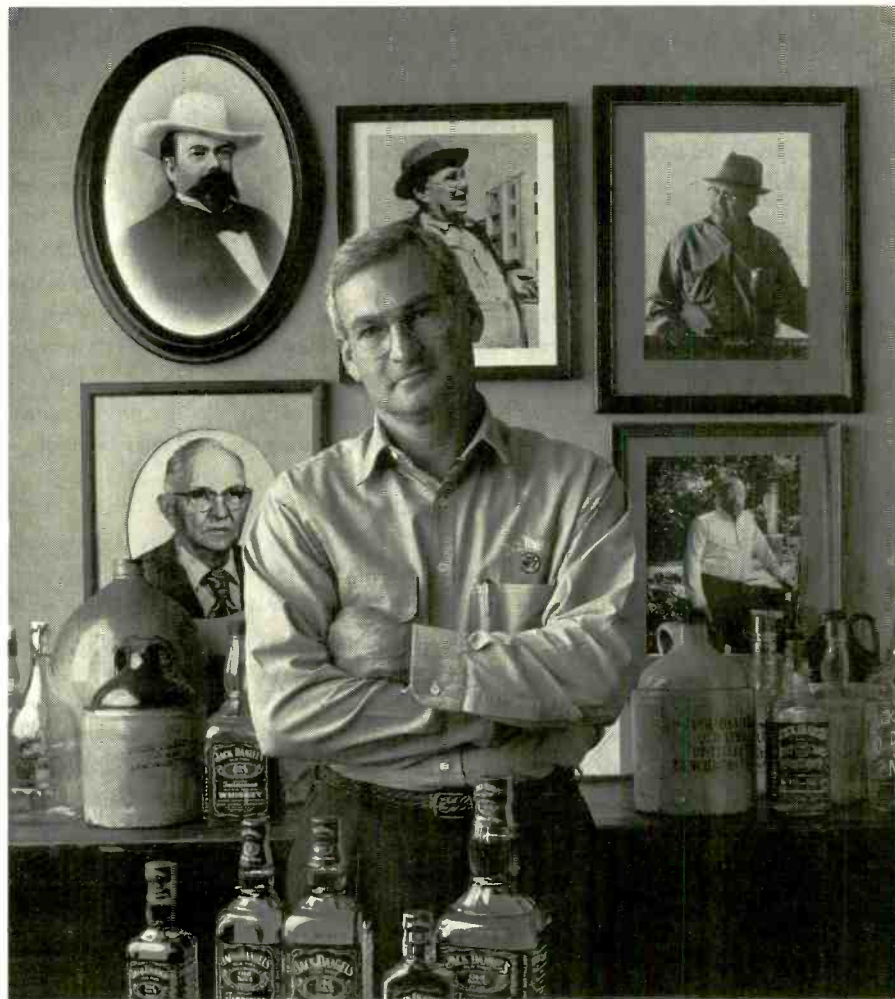
### Car Stereo in the Cold

**Q** When the temperature outdoors is fairly cold, 30° to 40°, my car stereo's output will raise itself to full volume. All controls lock up except those for power (thankfully), treble, bass, balance, and fade. (The last four controls are pots.) When the weather warms up, I once again have control over my system. Even when things are working right, I hear a buzz or hiss in the right channel. Could the speakers be damaged as a result of the very high volume poured into them? Is this a matter of mechanics, poor soldering, or broken traces? Is it a matter of poor design, in which temperature was not taken into account?—Robert P. Lyons, Northville, Mich.

**A** Whether or not poor design is involved, temperature obviously plays a part in your problem. Contraction can make a poorly soldered connection open up or cause a partially severed trace to open. I have also seen ICs fail in cold temperatures. I think this failure is, for the most part, caused by poorly made internal connections.

If you can remove the equipment from the car and still operate it, do so. Remove the chassis covers and spray a coolant on various components. It will be helpful to have a schematic of the equipment so you can trace out the action of the controls. Spray coolant on the items which strike you as suspicious. The goal is to identify the one component which, when cooled sufficiently, will produce the effects you have described.

The buzz or hiss you mentioned is another matter. If this sound is more easily noticed when the volume is low, it is more likely that the speakers were damaged. Inasmuch as you have the radio on the bench in order to solve the main problem, connect other loudspeakers to the system. If the sound is "clean," one or more drivers in your car have been damaged. You can also check for speaker damage with the equipment in the car, by interchanging the left and the right loudspeaker connections so that sound originally intended for the



Clockwise from top left, that's Jack Daniel, Jess Motlow, Lem Tolley, Frank Ebbo and Jess Gamble. (Jimmy's in the middle).

**JACK DANIEL'S HEAD DISTILLER, Jimmy Bedford, has lots of folks looking over his shoulder.**

Since 1866, we've had only six head distillers. (Every one a Tennessee boy, starting with Mr. Jack Daniel himself.) Like those before him, Jimmy's mindful of our traditions, such as the oldtime way we smooth our whiskey through 10 feet of hard maple charcoal. He knows Jack Daniel's drinkers will judge him with every sip. So he's not about to change a thing. The five gentlemen on his wall surely must be pleased about that.

SMOOTH SIPPIN'  
TENNESSEE WHISKEY



left channel will be fed to the right, and vice versa. If the buzz moves to the left channel, the problem is in the electronics. If it remains in the right speakers, you have damaged drivers in that channel.

### MiniDisc or DAT?

**Q** *I am looking for a better recording system, mainly for making live recordings, and am undecided between DAT and MiniDisc. The MiniDisc offers a maximum of 72 minutes uninterrupted recording time before having to change discs. The DAT system permits a maximum of 120 minutes before having to change tape. What's your pick?*—Name withheld

**A** As far as I am concerned, when it comes to recording of just about any kind, Digital Audio Tape wins, hands down! Its audio quality is much superior to MiniDisc's. I have been told that the MD format has been improved, and without the need to scrap previously made discs. If such sonic improvements have come about, I might have to reconsider my present position.

Like you, I do quite a bit of live recording. I have yet to encounter a circumstance in which my DAT ran out before the end of the performance or before a point at which I would have time to change tapes. The 72 minutes offered by MD isn't terrible, but I have definitely been in situations where this would not have been enough.

If you need more than 2 hours of recording time, many DAT recorders offer a "long-play" mode which doubles the amount of recording time, enough even for Wagner. In this slow-speed mode, the upper frequency cutoff drops from 22 kHz down to 14.5 kHz, which is still not too shabby. I think the audio quality under these conditions is still better overall than what you will hear on a MiniDisc. My problem with that medium is not frequency response, but transient response.

The speed with which MD can retrieve a given track or portion of a program surpasses that of any other recording system; it's an incredibly wonderful feature that might be a very important consideration for some users. MiniDisc also allows far more flexible use of its recording time: If you erase a 5-minute track three and a 4-minute track seven, you can use that space to record a single, 9-minute track.

### Surround and Equalizers

**Q** *I have just set up a home theater system. Should I engage my outboard equalizer, given that some of my components have built-in equalizers?*—Aaron Johnson, Overland Park, Kans.

**A** The only restriction involving the use of equalizers, inboard or out, is that no equalizer should be placed between the program source and the surround decoder. The equalizer's phase shift would interfere with the phase-encoded surround signals, possibly shifting the locations of sounds.

### Subwoofer Muddiness

**Q** *When my inexpensive passive subwoofer and my bookshelf speakers are connected to my amp, the bass sounds muddy, and the sweet, transparent qualities of my bookshelf speakers are considerably reduced. I can't complain that the bass isn't deep, however. Would using a separate power amp for the subwoofer improve the sound?*—Douglas C. Ho, Kew Gardens, N.Y.

**A** Either your subwoofer is too loud or your subwoofer and bookshelf speakers are reproducing some of the same frequencies, overemphasizing the part of the spectrum where they overlap.

As to the first problem, if your subwoofer has no level control, a separate amplifier could be used to overcome the problem. If the subwoofer has no crossover built in, you will also need an electronic crossover to feed bass to the subwoofer amp and to feed everything else to your present power amplifier and satellite loudspeakers. This crossover system will also have independent level controls for each amplifier, permitting you to match the acoustical output from the satellites to that of the subwoofers.

If your problem is a frequency overlap, you can use a passive crossover to feed bass frequencies from your amp to the subwoofer and to feed other frequencies to the satellites. Most subwoofers have such crossovers built in, but they're only effective if the satellites are connected to the crossover output, not directly to the amp. A true crossover will keep high frequencies out of the woofer and lows out of the satellites. However, some inexpensive subwoofers' "crossovers" only block bass feed to the satellites, allowing the subwoofer to play into the satellites' range. A

## Definitive Technology<sup>®</sup> Authorized Dealers

**AK**- Alaska Audio; Juneau; Pyramid; Anchorage.  
**AL**- Cohen's Electronics; Montgomery; Kinkaid's TV; Tuscaloosa; Likie Audio; Birmingham.  
**AR**- Custom AV; Little Rock.  
**AZ**- Jerry's Audio Video; Phoenix, Tucson.  
**CA**- Access to Music; Larkspur; Audio Concepts; Long Beach; San Gabriel Bay Area Audio; San Jose; Coast Satellite; Atascadero; Santa Maria; Creative Stereo; Santa Barbara; Ventura; David Rutledge Audio; Palm Desert; DB Audio; Berkeley; Larson's; Redding; Pacific Coast AV; Newport Beach; Paradyme; Sacramento; Performance Audio; San Francisco; Sound Co.; Escondido; San Diego; Systems Design; Redondo Beach; Videotek; Westminster; Westchester TV; Bakersfield; Wilson AV; Woodland Hills.  
**CO**- Listen Up; Denver, Boulder, Colorado Springs.  
**CT**- Al Franklin's; Hartford; Carston's AV; Danbury; Robert's Audio Video; New London; Sound Playground; Newington, Orange, Manchester, Norwich.  
**DC**- Suburbs; Audio Buys.  
**DE**- Sound Studio; Dover, Newark, Wilmington.  
**FL**- Absolute Sound; Winter Park; Audio Center; Deerfield Beach; Audio Video Interiors; Melbourne; Invisible Audio; Pensacola; Hoyt Stereo; Jacksonville; Palm Audio; Destin; Sensitive Sd.; Tampa; Sound Components; Coral Gables; Sound Ideas; Gainesville; Sound Insight; Ft. Pierce; Stereotypes; Daytona Beach; Stereo World; Ft. Myers, Naples; Stuart; AV; Stuart.  
**GA**- Merit TV; Columbus; Music Audio; Atlanta; Stereo Connections; Valosta; Stereo Shop; Martinez; Stereo Video Systems; Marietta.  
**HI**- Audio Center; Honolulu.  
**IA**- Audio Video Logic; Des Moines; Camera Corner; Davenport; Hawkeye; Iowa City, Cedar Falls.  
**ID**- Good Ear; Boise.  
**IL**- United Audio Centers; Chicago & Suburbs; Camera Corner; Bloomington; Cars & Stereos; Rockford; Jon's Home Center; Quincy; Sound Forum; Crystal Lake; Select Sound; Naperville; Sundown AV; Springfield.  
**IN**- Ovation Audio; Clarksville, Indianapolis.  
**KS**- Accent Sound; Overland Park; Advance Audio; Wichita; Audio Junction; Junction City.  
**KY**- Ovation Audio; Lexington, Louisville.  
**LA**- Alterman Audio; New Orleans, Metairie, Covington; Music Plus; Baton Rouge; Wright's Sound Gallery; Shreveport.  
**MA**- Goodwins Audio; Boston, Shrewsbury; Nantucket Sound; Hyannis; Sound Playground; Springfield.  
**MD**- Audio Buys; Annapolis, Gaithersburg, Laurel, Rockville, Waldorf; Cumberland Elec.; Cumberland; Gramophone; Balt., Ellicott City; Soundcape; Baltimore.  
**ME**- Cookin'; Portland.  
**MI**- Pears's; Detroit, Troy; Classical Jazz; Holland; Classic Stereo; Kalamazoo, Grand Rapids; Front Row AV; Flint; Future Sound; Ypsilanti; Court St. Listening Room; Midland, Saginaw.  
**MN**- Audio Designs; Winona; Audio Perfection; Minneapolis.  
**MO**- Independence AV; Independence; Sd. Central; St. Louis.  
**MS**- McLelland TV; Hattiesburg; Players AV; Ridgeland; Rocky Mountain Hi Fi; Gulf Falls.  
**NC**- Audio Video Systems; Charlotte; Stereo Sound; Durham, Greensboro, Raleigh, Winston Salem; Audio Lab; Wilmington; Tri City Elect.; Conover.  
**NE**- Custom Electronics; Omaha, Lincoln.  
**NH**- Cookin'; Nashua, Manchester, Newington, Salem, S. Nashua.  
**NJ**- Hal's Stereo; Trenton; Monmouth Stereo; Monmouth, Walk; Sound Waves; Northfield; SoundWorks; Cherry Hill; Woodbridge Stereo; W. Caldwell, Woodbridge.  
**NV**- Upper Ear; Las Vegas.  
**NY**- Audio Breakthroughs; Manhasset; Audio Den; Lake Grove; Audio Expressions; Newburgh; Audio Junction; Watertown; Clark Music; Albany, Syracuse; Stereo Exchange; Manhattan, Nanuet; Hart Elect.; Vestal; Innovative Audio; Brooklyn; Listening Room; Scarsdale; Rowe Camera; Rochester; Sound Mill; Mt. Kisco, Yorktown Hts.; Speaker Shop; Amherst, Buffalo; Stellar Stereo; Ithaca.  
**OK**- Contemporary Sounds; Oklahoma City; K Labs Premium Audio; Tulsa.  
**OH**- Audio Craft; Akron, Cleveland, Mayfield Hts., Westlake; Audio Etc.; Dayton; Paragon Stereo; Toledo.  
**OR**- Bradford's HiFi; Eugene; Chelsea AV; Portland, Beaverton; Kelly's Home Ctr.; Salem; Larson's; Medford, Roseburg; Stereo Plant; Bend.  
**PA**- Gary's Elect.; State College; GNT Stereo; Lancaster; Hart Elect.; Blakey, Kingston; Hi Fi Home; Abington, Brookville; Palmer Audio; Allentown; Stereoland; Natrona Heights (Pittsburgh); Studio One; Erie.  
**SC**- AV Design; Charleston; Upstairs Audio; Columbia.  
**TN**- Hi Fi Buys; Nashville; Lindsay Ward; Knoxville; Modern Music; Memphis; New Wave Elect.; Jackson; Sound Room; Johnson City.  
**TX**- Home Entertainment; Dallas, Houston; Audio Tech; Temple, Waco; Audio Video; College Station; Brock AV; Beaumont; Bunkley's Sd. Systems; Abilene; Bjorn's; San Antonio; High Fidelity; Austin; Krystal Klear; Dallas; Marvin Electronics; Ft. Worth; Sd. Box; San Angelo; Sd. Quest; El Paso; Sd. Systems; Amarillo; Sd. Towne; TexasKana.  
**UT**- Alpine Elect.; Provo; Audio Works; Salt Lake City; Stokes Bros.; Logan.  
**VA**- Audio Buys; Arlington, Fairfax, Falls Church, Manassas; Audio Connection; Virginia Beach; Audiotechnica; Roanoke; Home Media Store; Richmond; Stereotype; Charlottesville.  
**VT**- Audio Video Authority; S. Burlington.  
**WA**- Definitive Audio; Bellevue, Seattle; Evergreen Audio; Silverdale; Pacific St. & Sd.; Wenatchee; Tin Ear; Kennewick.  
**WVA**- Sound Post; Princeton.  
**WI**- Audio Emporium; Milwaukee; Absolute Sound & Vision; Sheboygan; Sound World; Wausau.  
**Puerto Rico**- Precision Audio; Rio Piedras.  
**Canada**- A & B Sound; Calgary, Edmonton, Kelowna, Vancouver & Suburbs, Victoria; Advance Electronics; Winnipeg; Audio Ctr.; Montreal, Ottawa; Bay Bloor Radio; Toronto; CO-RA; Quebec City; Digital Dynamics; Clearbrook; Great West Audio; London; Lipton's; New Market; Ontario; Peak Audio; Halifax; Sd. Room; Vancouver; Sd. Station; Courtenay.  
**Mexico**- Contact Grupo Volumen; Mexico City.

# Definitive's PowerField 1500 Wins the Subwoofer of the Year Award

*Our extraordinary new PowerField™ 1500 features a 250-watt RMS amp, fully adjustable electronic crossover and massive 15-inch driver for only \$995*

## **"Showstoppers" – Stereo Review**

Definitive's PowerField 1500 has triumphed, winning Subwoofer of the Year in the Audio Video Grand Prix. We set out to build the world's finest sounding subwoofers, and we have done it. Experts agree that we have achieved the perfect synergy of powerful, earth-shaking bass for home theater and a refined and expressive musicality.

All three Definitive powered subwoofers feature our PowerField Technology, monocoque cabinets, high-power high-current amplifiers, fully adjustable electronic crossovers and massive 15" or 18" drivers. The result is the absolute ultimate in subwoofer performance, awesome bass which thunders down below 15 Hz, yet retains complete musical accuracy for your total enjoyment.



*Our Audio Video Grand Prix and CES Design & Engineering Award winners deliver ultimate bass performance to you.*

## **Perfect Bass for Your System**

To ensure optimum performance in your home, the PowerFields have high and low level inputs and outputs, adjustable high pass, low pass and volume controls (plus phase controls for the PF 1500 and 1800) to guarantee perfect blending with any system and superior bass response in any room.

## **Super Subwoofers from \$699**

Three extraordinary Definitive powered subwoofers are now available: the PowerField 15 (185-watts RMS, 15-inch at \$699), PowerField 1500 (250-watts RMS, 15-inch at \$995) and PowerField 1800 (500-watts RMS, 18-inch at \$1599). Hear them today!

**Definitive Technology®**

11105 Valley Heights Drive • Baltimore, MD 21117  
(410) 363-7148

# VIDEO



## A CODING CHALLENGE

by Robert A. Finger

Audio is playing a more important role in video each year; multichannel audio in home theater is one good example. But to find video programming delivered on a traditional audio product like CD seems strange indeed. And many might at first dismiss the very possibility. With CD's formatted capacity of about 600 megabytes, it wasn't hard, years ago, to speculate on the future potential of CD as a generalized digital platform, even for images—hence the creation of CD-ROM. What was needed to fulfill this dream for video was a new coding scheme and advances in chip technology. Since CD is well accepted in the market as an audio format, and a large manufacturing base for player components and discs already exists, traditional audio equipment and software companies are in a good position to improve the format

by adding video. There are, however, many interesting technical challenges.

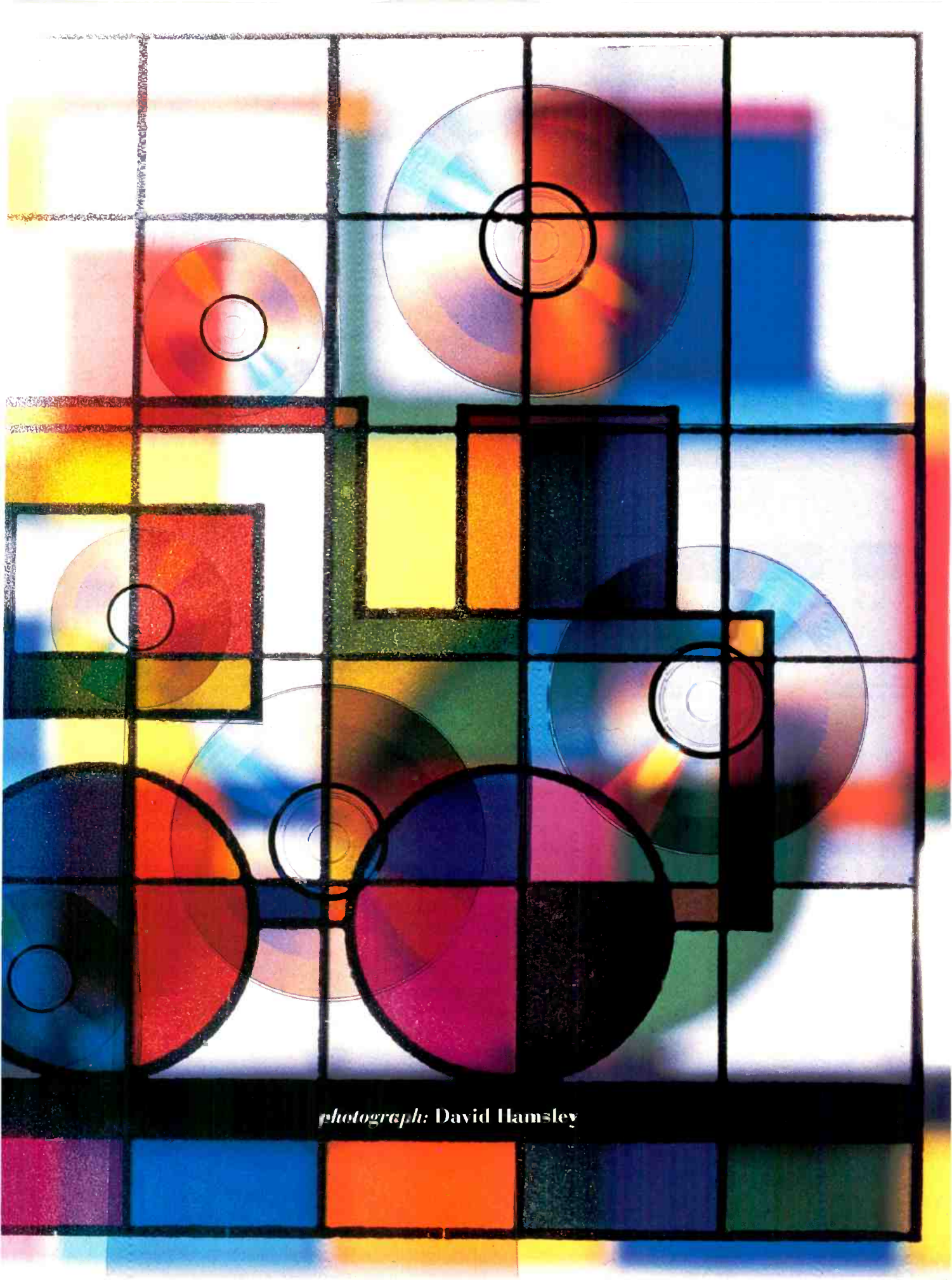
### THE VIDEO CD CONCEPT

Video CD offers digital audio approaching the quality of CD, simultaneous with high-quality video on a par with VHS, and Video CD players are completely compatible with the audio CD.

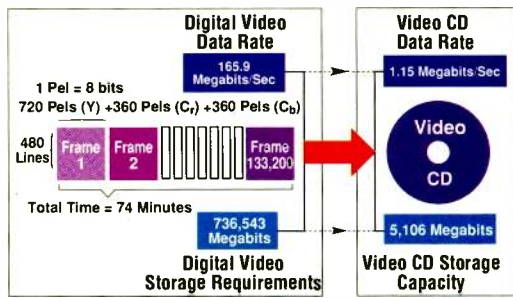
Since player components are those used for audio CD, a wide variety of portable and home models, including changers, is expected soon. Some will have integrated video displays; others will require standard connection to an A/V receiver or TV.

Robert A. Finger is Assistant Director, Audio/Video Group, at the Business Engineering Center of Matsushita Electric Corp. of America in Secaucus, N.J.





*photograph: David Hamsley*

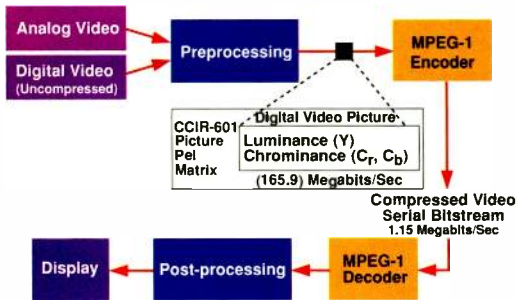


**Fig. 1**—The video encoding challenge: Storing 736,543 megabits worth of CCIR-601 digital video on a 5,106-megabit disc.

Support from major software companies with a variety of music videos, movies, cartoons, and karaoke is also expected. While full-length feature films, typically about 110 minutes, will require a two-disc set, it is not hard to envision a future Video CD changer with buffer memory allowing virtually seamless viewing of multiple discs. Also, video adaptors compatible with Video CD have already been announced for 3DO and CD-I players. This is important, since Video CD is intended to complement, not compete with, these interactive products—software companies need only release music videos or movies on one format, Video CD.

with video, as were physical media such as disc and tape as well as communications such as digital audio broadcasting. A flexible standard resulted, which accommodates a wide variety of bit rates and complexities. MPEG created three broad implementation classes called “Layers.” The one used for Video CD is Layer-II, at a sampling frequency of 44,100 samples per second.

The MPEG video and audio specifications were merged with player control and access information during Video CD authoring to produce a “White Book” master used in disc manufacturing, just like CD-ROM.



**Fig. 2**—Video encoding and decoding.

### VIDEO CD SOFTWARE: BASIC SPECIFICATIONS

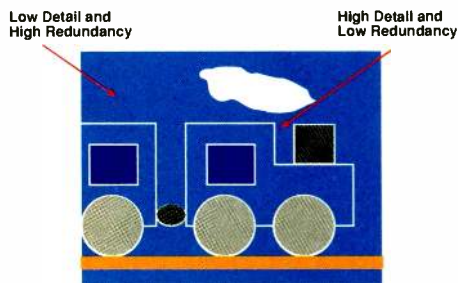
The Video CD specifications (Table 1), sometimes called the “White Book,” include portions of other technologies by way of reference, such as CD digital audio, CD-ROM, CD-I (Bridge), and ISO-11172 (Motion Picture Experts Group, or MPEG). Over the years there have been various MPEG standardization activities (some still continue today), but the one used to code Video CD software is called MPEG-1. Although MPEG-1 allows a choice of operating parameters, those selected for Video CD provide high image and audio quality at bit rates compatible with CD.

### THE VIDEO ENCODING CHALLENGE

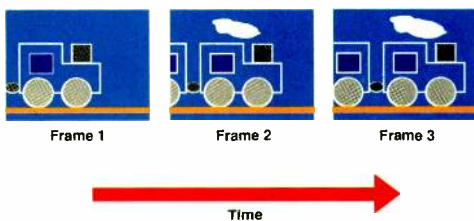
But wait a minute, you might say! How is this really possible? Granted, CD has significant data storage capacity, but quality digital video demands capacity and a high data rate as well. Remember, a digital video master might easily contain upwards of 137,000 megabytes for a full-length movie and require a transmission rate greater than 165.9 megabits/S. Really, the challenges are daunting, as is clearly shown in Fig. 1, using CCIR-601 video format as input. First, storage requirements of digital video masters need to be matched to the available capacity of CD, as shown by the numbers in the lower half. Second, the same needs to be done for the data rates, as shown in the upper half. When audio is included, the mismatch is actually greater. It comes down to trying to reduce video rates and storage by more than 140 to 1!

Video CD resolution is 352 horizontal x 240 vertical pels for NTSC, with a pel geometry which gives the display a familiar 4 x 3 look. (I’ll define “pel” later.) Notice in Table 1 that the video rate of about 1.2 megabits/S plus the audio rate of 224 kilobits/S (stereo) fit nicely into the CD requirements of about 1.4 megabits/S. Software compatibility with players is insured by requiring that decoding be done within a maximum video buffer size of 40 kilobytes.

Very challenging indeed, especially if a high-quality image, acceptable to consumers and critical software companies, is required. So how can this audio product even hope to come close to meeting the needs of digital video? Well, in a phrase, it’s all in the way you look at it. Joking aside, I hope you realize this means using perceptual video and audio coding—that’s what MPEG provides.



**Fig. 3**—Redundancy in individual pictures can be exploited.



**Fig. 4**—Exploiting redundancy in picture sequences.

### VIDEO ENCODING/DECODING SCHEME

Start with the best-quality video source, either analog or digital, and preprocess it to obtain a digital video component source in

During the discussions leading to the formation of MPEG-1, many audio applications were considered, ranging from audio only to audio

Y, C format (Y as luminance,  $C_r$  as red, and  $C_b$  as blue color difference). One might ask, why not the more familiar R, G, B? Well, it turns out that the Y, C format is more like the way humans perceive images. Perception of dark and light, which is called brightness, starts with the physical or objective parameter of luminance (light intensity). So the RGB form is not as useful for direct coding purposes using perceptual techniques. Remember, I mentioned that it's all in the way you look at it.

After preprocessing (Fig. 2), a digital video picture bitstream at about 165.9 megabits/S is MPEG-encoded to a compressed video bitstream of 1.15 megabits/S. Note that the MPEG encoding method is not completely fixed; only the decoder and the bitstream organization are standardized. Of course, the Video CD application itself provides a constraint. Flexibility in the encoder is very important, because it permits improvement in image quality as technology and experience improve. Output of the decoder is post-processed to condition the images for a particular display (NTSC, for example). If everything went right, the moving image should look like the original, as perceived by the viewer.

#### FIRST STEPS IN COMPRESSION

Since pictures have separate luminance (Y) and color components (C), from here on we'll just consider luminance. Try to

imagine the underlying structure of the digital picture as a rectangular array or matrix of many very small, distinct picture elements (pels, or pixels). These pels are sufficiently small that individual ones might not be seen at a normal viewing distance. Each pel has brightness (luminance) or color that corresponds with 8-bit precision to a digital video sample value.

Call this the "pel data value" or simply "pel value" for convenience. Total pel luminance data per picture is 2.76 megabits, and the goal is to recode to about 19.15 kilobits on average!

That's a tough goal to meet. At the outset, some sacrifice is needed before any MPEG encoding takes place. A reduction in vertical and horizontal resolution by half, to 352H x 240V, provides good image quality and a 4-to-1 saving in bit rate. While helpful, it's far from what's needed. Fortunately, more sophisticated approaches and greater gains can be made.

#### EXPLOITING REDUNDANCY

The nature of pictures holds the secret to encoding, and particularly moving pictures. Although the illustrations are very simple, actually they are more nearly typical than one might suspect. First, examine portions of the image in Fig. 3 where there are noticeable changes in brightness or from the



**THE NEW  
MEDIUM WILL  
HAVE AUDIO  
OF NEAR  
CD QUALITY  
AND VIDEO  
ON A PAR  
WITH VHS.**

broad area or background; perhaps calling this "detail" will be useful. Second, examine the uniformity in the background itself. In areas of the picture where there is a lack of detail, such as the background, neighboring pels have the same or nearly the same brightness (pel value). A question comes quickly to mind: Might it be possible to de-

termine the average brightness of the background, then assign many of the pels in that region to have that single pel value. The encoder would discard each of the original pel values but would store only the average value and the number of pels recoded. During reconstruction, the decoder would simply reassign the stored average as the new pel value to each indicated pel in the correct display position.

While this usually creates some change in the picture, it might not be noticed if done carefully, and many bits will be saved. In a sense, the discarded pels might be termed "spatially redundant," since many of them can be reliably predicted from their neighbors.

On the other hand, regions of the picture with detail contain pel values that can change quickly from pel to pel. Here, careful reassignment is necessary in order to

Table I—Video CD software specifications.

Parameter	VIDEO	
	NTSC	PAL
Coding Method	MPEG-1	MPEG-1
Resolution, Pels		
Horizontal	352	352
Vertical	240	288
Frame Rate, Hz	29.97	25
Pel Aspect Ratio	1.0950	0.9157
Bit Rate, Kilobits/Second	1,151.929	1,151.929
Video Buffer Size, Kilobytes	40	40
	AUDIO	
Coding Method	MPEG-1, Layer-II	
Sampling Rate, kHz	44.1	
Bit Rate, Kilobits/Second	224	
Emphasis Mode	On or off	
	Dual-channel or stereo	

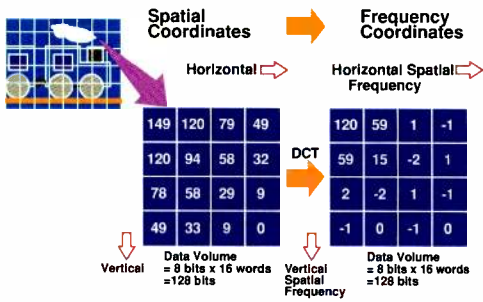


Fig. 5—The discrete cosine transform (DCT).

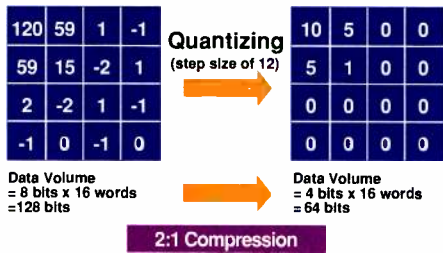


Fig. 6—Quantization of DCT components.

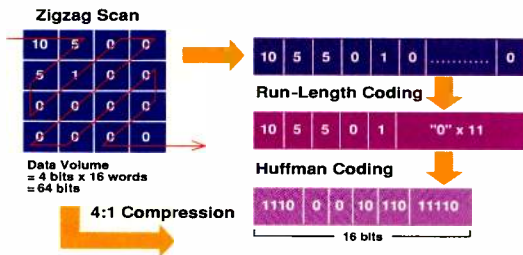


Fig. 7—Variable-length coding (VLC).

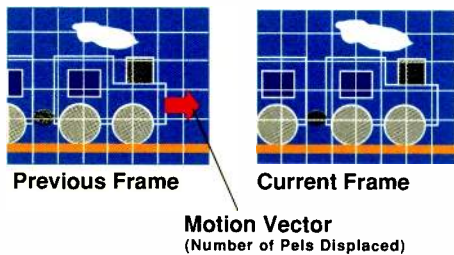


Fig. 8—Motion detection.

avoid noticeable change. To help code detail, the encoder could use some of the bits saved from efficiently encoding the background. But the only real solution is to discover which pel changes are not noticeable under normal viewing conditions. Human vision limitations need to be exploited by allocating fewer bits to less noticeable pels.

### REDUNDANCY IN SEQUENCES

Surprisingly, moving pictures actually provide more opportunity to exploit redundancy than individual pictures. A moving image from film or video is really a sequence of separate pictures (frames) displayed very rapidly in succession. For film this rate is 24 frames per second, and for NTSC video it is nominally 30 per second. Each frame is not unique from its neighbor. If it were, the moving image would likely appear as very confused. As seen in Fig. 4, there is predictability to the scene in frames 2 and 3 after observing frame 1. Future frames are usually much related to ones in the near past. Newton's laws of motion and mechanics of rigid bodies undoubtedly create this favorable constraint. But an easily repeatable scheme is really needed to take advantage of this situation.

For example, during playback a decoder might use detail already available from frame 1, and then simply put it into the right spot in frames 2 and 3, where the reconstruction takes place; only pointers or displacements to the position of frame-1 pel data would be stored. Since there are normally many closely related frames in motion video, this idea seems to have much potential for bit saving. In a sense, these discarded pel values might be considered "temporally redundant," since they can be reliably predicted from earlier ones in the time sequence. While complexity and cost would increase in both the encoder and decoder, it might be a good de-

sign trade-off—and perhaps the only effective solution!

### DISCRETE COSINE TRANSFORM

Now let's take a look at implementing these ideas. The first method uses a Discrete Cosine Transform (DCT), not to be confused with discrete Fourier transform. DCTs are used not only to directly code the picture but also to help discover where the detail lies, to remove or discard what cannot be seen, and to organize in an efficient manner what visual data is important to preserve. Here is the process:

Pictures are divided into small regions, as shown in Fig. 5. Focus in on one region, and further subdivide it; for convenience, call the region a "block" and each smaller unit a "pel." In practice, the present pel size would be much too large, but I've chosen it anyway to make the explanation that follows simple. Remember, each pel value (number) represents the luminance, or brightness, at that position. Values range from 0 to 255, since they originate from 8-bit samples. Relatively large numbers mean bright or relatively large values of luminance; relatively small numbers mean dark or relatively small values of luminance. In the picture, a very small section of the engine smokestack is depicted by dark lines lying in the lower part of the chosen block. And, sure enough, the small numbers of 0 to 49 in the lower pels correspond to the general position of the dark lines of the smokestack outline. And the larger numbers of 49 to 149 in the upper pels generally correspond to the brighter background above the smokestack.

A DCT is then applied to this two-dimensional set of pel values extending horizontally and vertically within the block. The side-by-side spatial relationship of the pel luminance data is now represented in what more or less indicates the amplitude and rate at which pel values change relative to their neighbors: Spatial frequency is a useful descriptive term. Results of the transformation are organized in a different two-dimensional matrix or array, with values shown within cells for convenient reference. But these DCT output cells are no longer pels, as they were before the DCT was applied; they are just an ordered set of

numbers that are usually called output coefficients.

Let's see how to navigate within the DCT output array. Take special note of the upper left corner cell, with the value of 120. This first DCT output coefficient, usually called the d.c. value, represents the average luminance of the entire block—not the entire picture, just this particular collection of pels. The term "average" is used because it relates better to the physical world. However, strictly speaking, the mathematical relationship used to compute the DCT, in effect, sums all the individual pel values and then provides a number only proportional to the "average." In this example, the first output coefficient of the DCT is reduced proportionally from the sum by only a factor of 8, not the array size of 16. That is why the number 120 may look high for a truly "average value."

Cells away from the d.c. value contain what are called a.c. coefficients. Observe the many small values (such as 1, 2, -1, and -2) in these cells. Such low numbers imply no quick changes in brightness from pel to pel, either horizontally or vertically. Changes from pel to pel do occur, but only slowly, or at a low spatial rate. In practice, it turns out, many zero- or near-zero-valued a.c. coefficients usually result from applying the DCT to normal video pictures. High energy levels in higher a.c. coefficients just do not occur very often.

Notice that the DCT itself has not changed the number of data bits; it still remains 128. Any zero-valued DCT coefficients are still represented as 8-bit code words at this stage. Also, the DCT is computationally very efficient, and has been well researched and found to give very good results visually. MPEG-1 encoders actually use an 8 x 8 pel array as a block. Resulting numbers would come out differently, but the principles would be exactly the same. So the DCT provides a tool to code the pel values using the strategy mentioned earlier under spatial redundancy.

### QUANTIZATION OF DCT COMPONENTS

Bit-rate reduction really starts in this next step, where DCT output values are quantized and reorganized in a way that

minimizes the errors to the human visual system. In Fig. 6, the process is rather simple, and applying a quantizing step size of 12 to the DCT coefficients does the trick. Here, the key number which determines the acceptable step size is the average luminance value or d.c. coefficient. After quantization is performed, only 4 bits are necessary to code any coefficient in the output array, as compared with 8 bits for the original pel values.

Notice the many zeros in the cells of a.c. coefficients extending along the array diagonal, a very favorable situation. But often, greater complexity exists in the DCT output array; consequently, more clever handling of quantization is needed to get this many zeros. Human vision is more sensitive to luminance differences over large rather than small areas. This suggests that the d.c. value should be quantized more accurately (finely) than the a.c. values. To do this, an "intra" quantizing matrix is used, which specifies the step size applied to each coefficient separately. Higher a.c. frequencies generally get larger matrix values and larger steps, and they are quantized more coarsely. Other procedures are used as well.

MPEG-1 encoders use typical matrix values ranging from 8 for d.c. to more than 80 for some of the a.c. coefficients. Actual values depend on many factors, including experience on what combinations create the best subjective results. A standard matrix is usually set as default and used repeatedly. But a custom one can be created, even adaptively for different blocks of the

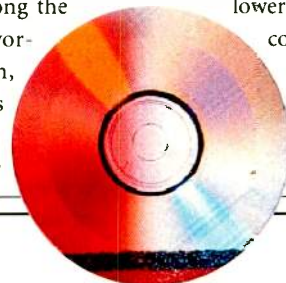
same picture. An inverse matrix is stored with the pel data and used at the decoder.

### VARIABLE-LENGTH CODING

Next, DCT coefficients are organized and given variable-length coding (VLC). The idea is to exploit any natural structure in the quantized data by assigning different length code words to data patterns based on frequency of occurrence. If data were truly random, VLC would not work well, but when correctly used, VLC results in a lower average data rate than a directly coded version.

DCT output coefficients are scanned in a "zigzag" manner (Fig. 7) and placed in a row, side by side, in preparation for storage as a serial bit-stream. Zigzag might at first seem curious, so some explanation is in order. First, remember what the DCT looks like at this stage. Coefficients farther away from the d.c. value are more likely to have zero or near-zero values. Since this can occur both horizontally and vertically in equal amounts, there tends to be some symmetry about the array diagonal. "Zigzagging" is just an organized method of moving along the diagonal, away from the d.c. coefficient. It produces sequential (or serial) data, usually having long strings of zeros.

Such strings can be coded very efficiently using run-length and Huffman coding. During system design, a code table is built, with entries uniquely identifying the different strings with successive zero values (called run-lengths) expected at the encoder. A variable-length code is then assigned, giving shorter code words to frequently occurring strings and longer code words to infrequent strings. Such a Huffman-code table could be rather complex and extensive, since the



**BY REDUCING VIDEO RATES AND STORAGE BY MORE THAN 140 TO 1, A FULL-LENGTH MOVIE WILL FIT ON A SINGLE VIDEO CD.**

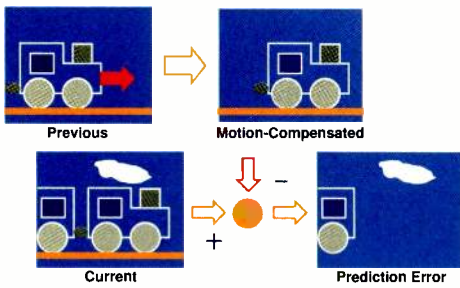


Fig. 9—Motion compensation.

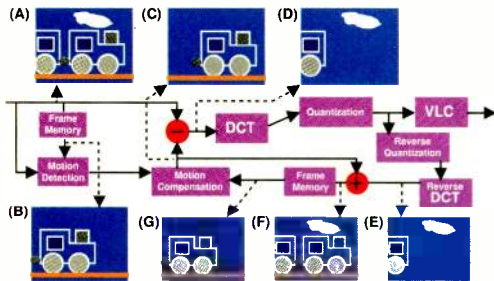


Fig. 10—A more elaborate type of motion-compensation coding.

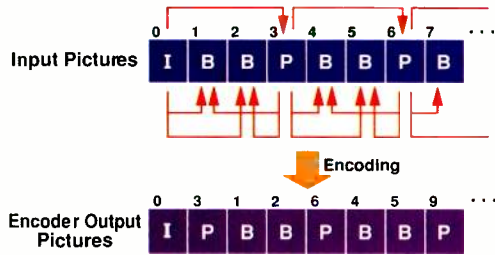


Fig. 11—Organization of Video CD picture groups.

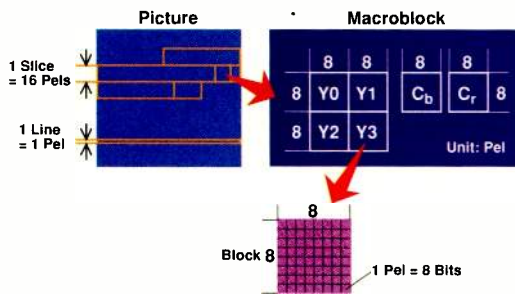


Fig. 12—Picture structure of Video CD.

association of code word to unique string needs to be done statistically. Knowledge gained by experimentation or analysis is critical to its construction. Done correctly, it saves bits and makes the increased memory at the decoder a worthwhile trade-off. After zigzag scan, the encoder substitutes the table code word for each string encountered in the sequence and then stores the new serial data. At the decoder, the inverse is performed, using a lookup table in player memory to reconstruct the original strings.

In a simple illustration (Fig. 7), the sequence of quantized coefficients resulting from the zigzag scan is shown at the top, with the string of successive zeros identified as a run-length of "0" x 11 just below. Finally, at the bottom is a Huffman-coded sequence with the substituted code words from a hypothetical table. Although in practice results will vary with actual pattern, it is important to note the further data reduction of 4 to 1 in this situation.

### MOTION DETECTION

Moving pictures offer good opportunity for data reduction, since details of the current frame are very often found in previous frames (Fig. 8). If the engine from the previous frame is already coded, then it is only necessary to find out how many pels the current image shifted and to store that displacement. It is not necessary to separately code this engine detail again. The displacement, called motion vector(s), is determined horizontally and vertically and requires much less storage than the directly coded detail using DCT and VLC. Not only can motion vectors be derived using previous pictures looking forward to the current picture, but they can also be obtained using future pictures looking backward.

Finding vectors is basically a search process, and this takes time in the encoder. Small regions of the

current picture are systematically compared with regions in a previous picture. When a match is made on the basis of some error criteria, the motion vector is computed and stored. This could be done for each block, but to reduce complexity, it is best to use a somewhat larger region based on a structure of four luminance blocks, called a macroblock (2H x 2V). Vectors do not generally change very much from frame to frame. So to keep code words short and save bits, only the difference from the vectors of the previous frame is coded, using another variable-length code table. MPEG-1 describes general search methodology, but the actual algorithm is not standardized.

### MOTION-COMPENSATED PICTURE CODING

Although a search strategy might work quite well, matching is by no means perfect. In a sense, the use of motion vectors is an attempt to predict what the current frame looks like, and, of course, this prediction will often have some error. Motion detection is usually performed over the entire current frame, one small region at a time, but for now think of the frame as a unit, as shown in Fig. 9. Portions of the current frame not found in the previous frame, like some of the train car detail, might be considered as typical imperfections (error) in the match. The following procedure accounts for this missing detail and makes the coding of the current frame complete.

The coding starts with a previous coded frame, already stored in memory, and applies the motion vectors calculated from the search operation. A motion-compensated (MC) intermediate frame results. Basically, it is a prediction of the current frame being coded and contains the image of the engine, shifted into the correct location. This MC frame is then subtracted from the actual current frame, resulting in a residual, often called the prediction error. Of course, the engine is now absent from this "error," but this new frame contains all remaining desired detail of the train car and cloud. Both DCT and VLC are now used to code the individual blocks of the prediction error which actually get stored.

A “non-intra” quantizer matrix, with all entries the same, is used in this step. A more complete encoding scheme is shown in Fig. 10.

### VIDEO CD PICTURE GROUPING

Different pictures are used in different ways in grouping the pictures for placement on a Video CD. For instance, to calculate motion vectors and prediction error of a current picture, another picture from that sequence is used as reference. Such references must be coded accurately and appear regularly. But if too few references occur, picture quality suffers; too many, and the bit rate increases. In fact, identification of attributes suitable for a reference is important. Therefore, three types of pictures are defined as “Intra-coded,” “Predictive-coded,” and “Bidirectional Predictive-coded.”

Intra-coded (“I”) pictures are very special, since they are coded independently of other pictures, using DCT and VLC applied directly to blocks without any motion compensation process. For this reason, they require the most storage and occur least frequently. I-pictures are used as the best reference in coding all the other picture types with MC. Also, they are important in player special effects and in improving decoder fault tolerance by constraining error propagation during playback.

Predictive-coded (“P”) pictures are coded using only forward motion detection to calculate vectors in the MC process. A past “I” or another P-picture can be used as a reference for motion compensation. P-pictures take up less storage and are much more common than I-pictures.

Bidirectional Predictive-coded (“B”) pictures are coded by an interpolation method using both forward and backward

motion vectors in the MC process. Interpolation uses averaging, which helps to improve image quality by reducing noise and image distortion. However, two frame stores are required in the decoder, for past and future reference. Either “I” or P-pictures can be used as reference, but not a “B.” Generally, B-pictures are the most common, take the longest to encode, but produce the greatest data compression.

These relationships are shown in Fig. 11. Numbers indicate the natural display order, and the arrows indicate the use of the particular picture as a reference (tail) in coding another picture (head). The “I” picture at “0” connected to the “P” picture at “3” means “I” is used as a forward reference for “P.” And “P” at “3” connected to “P” at “6” means “P” is used as a forward reference for another “P.” Also shown is the influence of “I” and “P” on the B-pictures. This influ-

ence is necessarily more complex, and arrows are shown in both forward and backward directions. B-pictures always have arrowheads entering, never exiting. Notice the shuffled order at the final encoder output, which is used to help minimize hardware complexity and improve speed at the decoder.

### BITSTREAM AND PICTURE STRUCTURE

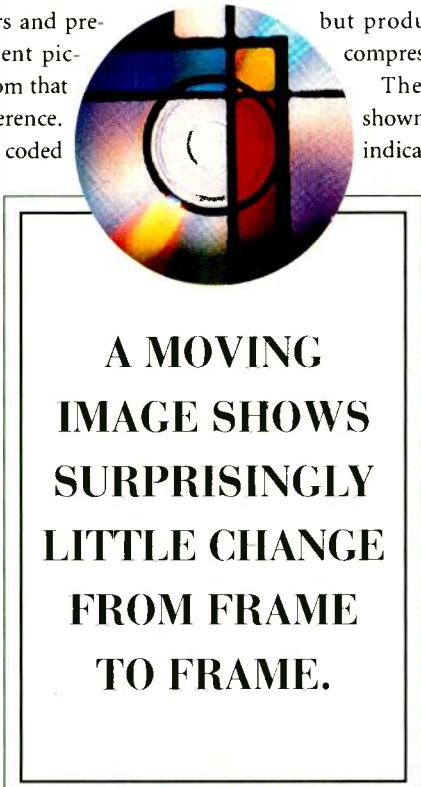
The coded video bitstream has an organizational hierarchy, starting with a “Sequence” and “Group of Pictures.” Individual pictures have a structure based on the “Slice,” “Macroblock,” and “Pel,” as shown in Fig. 12. A slice is simply a contiguous horizontal strip (or strips) of macroblocks extending left to right and down the picture. Macroblocks are made from an array of four luminance blocks (2H x 2V) and two separate color blocks designated as  $C_b$  and  $C_r$ . Each block is an array of 64 pels (8H x 8V). Color blocks are the result of sub-sampling at half the rate of luminance in a preprocess prior to MPEG encoding. Geometrically, each color pel is centered in a 2 x 2 array of luminance pels.

### VIDEO CD DECODING

Decoding is the exact inverse of encoding, but it is simpler because the search for motion detection is not needed. (See Fig. 13.) The compressed Video CD bitstream is demultiplexed, and the variable-length Huffman code is decoded. Data is requantized with the inverse of the quantizer matrix, rescaled if necessary, and spatially reconstructed with the inverse DCT. Two frame stores, for decoded past picture and future picture, are used as reference with the Huffman-decoded motion vectors in the MC process. A somewhat odd-looking summing and output configuration is shown because of the need to select the particular path (“I,” “P,” or “B” picture).

### VIDEO CD AUDIO ENCODING

Audio for Video CD is encoded using MPEG-1 Layer-II at a bit rate of 224 kilo-



**A MOVING  
IMAGE SHOWS  
SURPRISINGLY  
LITTLE CHANGE  
FROM FRAME  
TO FRAME.**

**Table II—Audio frame representation in MPEG-1 Layer-I and Layer-II.** Note, in the last three parameters, the coding-efficiency advantage of Layer-II over Layer-I.

Parameter	MPEG Layer-I	MPEG Layer-II
Frame Length, Samples	384	1,152
Sub-bands	32	32
Sub-band Samples	12	36
FFT, Samples	512	1,024
Bit Allocation, Bits	4 per	2 to 4, depending on sub-band
Scale-Factor Select Information, Bits	None	2 per sub-band
Scale Factors, Bits	6 per sub-band	6 to 18 per sub-band, selectable
Sample Grouping	None	3 per sub-band (granule)

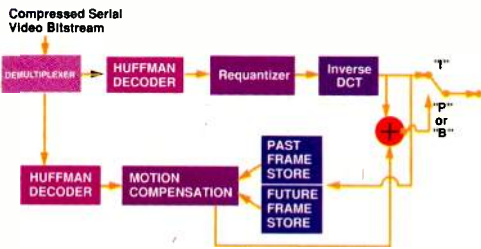


Fig. 13—Video CD decoder.

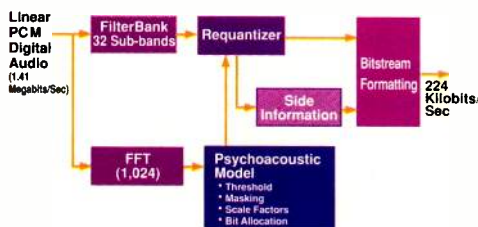


Fig. 14—Audio encoding for Video CD.

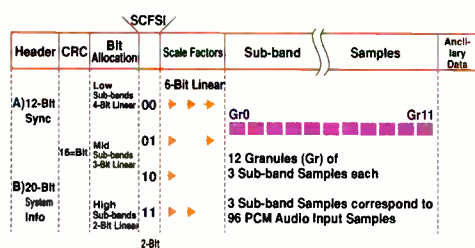


Fig. 15—Audio frame structure of MPEG Layer-II (1,152 PCM audio input samples, 24 mS, with 48-kHz sampling). "SCFSI" stands for scale-factor select information. (After Brandenburg and Stoll, AES Preprint, March 1992.)

bits/S for a stereo pair, which is 6.3 times less than the bit rate of CD digital audio. For comparison, DCC operates at a bit rate of 384 kilobits/S using a scheme very similar to MPEG-I Layer-I. Both Layer-I and Layer-II use the same psychoacoustic model, but they differ primarily in the choice of input audio frame length and data organization. (Good treatments of DCC perceptual coding have appeared in past articles of *Audio*, so there is no need to go into much detail here.) Layer-II uses a set of parameters specifically chosen to optimize audio performance for lower bit-rate applications.

Input to the encoder, shown in Fig. 14 as linear PCM, is first split into 32 frequency

sub-bands and then requantized under control of the psychoacoustic model. A 1,024-point FFT of the input helps in calculating the masking and audibility thresholds. The model sets values for scale factors and bit allocation for each sub-band. Bits are assigned out of a "bit pool," so that the average rate is kept constant. Encoder design is not completely fixed; only data format, bitstream organization, and decoder structure are standardized. Thus, advances in technology could produce even better audio quality. Among other things, the "side information" shown here refers to the

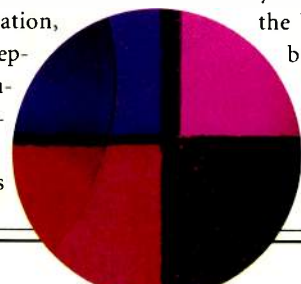
Decoding, not shown, is very simple and allows for economical player design. The bitstream is demultiplexed and then the scale factors and bit-allocation information are used to reconstruct the audio samples for each sub-band. An inverse filter bank is applied, which reconstructs the full-bandwidth time waveform. Phase information of the different signal components in the sub-bands is preserved during encoding and decoding, so surround-encoded material can be used at input.

#### MPEG LAYER-I AND LAYER-II

By this point, you might be curious about the differences between Layer-I and Layer-II. Even though both use the same 32 sub-bands, the audio input frame length for Layer-II is 1,152 samples, compared with 384 of Layer-I (see Table II). Consequently, Layer-II has better frequency resolution for determining masking characteristics and provides a more efficiently coded bitstream. A sacrifice in temporal resolu-

tion results in potentially less masking of pre- and post-echoes under some conditions. Overall, however, the result is better audio performance at the much reduced bit rates needed for Video CD.

Greater differences between Layer-I and Layer-II are found in the method of determining and organizing scale factors, bit allocation, and bitstream audio sample data. Layer-I requires a fixed 6 bits per scale factor for each coded sub-band. But in Layer-II, an algorithm examines the scale factors and reduces redundancy. Control, provided by scale-factor select information ("SCFSI" in Fig. 15), is signal-dependent and dynamically variable to reduce



**WITH MPEG-1,  
STANDARD-SIZE  
CDs CAN HOLD  
BOTH DIGITAL  
AUDIO AND  
FULL-MOTION  
VIDEO.**

the bit rate for scale factors by about a 2-to-1 ratio. Additionally, Layer-II uses a more complex scheme for sample quantization, which can vary as a function of the sub-band number. Greater masking in these higher sub-bands (higher frequencies) results in fewer but larger quantization steps. Because there are so few, efficiency comes by grouping three successive sub-band samples together into a "granule," with quantization applied to the granule, which yields a bit-rate saving over Layer-I. Codes

representing bit allocation vary in length depending on low, mid, and high sub-band number. Worth noting is that the frame rate for Layer-II is about three times less than it is for Layer-I. Consequently, there is less overhead needed for synchronization and control per the number of sub-band samples in Layer-II.

A combination of good quality digital audio and full-motion digital video is now available in CD format, all made possible by the use of MPEG encoding. A



# Breeding Tells

The heritage of the new Sonographe products is readily apparent. Consider these characteristic traits:

## Exceptional Musicality

Sonographe components are engineered and manufactured by conrad-johnson design, a company consistently acclaimed for the most musically satisfying audio components made.

## Timeless Styling

Accented by elegant champagne gold finished panels, these Sonographe products are readily distinguished from ordinary hi-fi components.

## Outstanding Value

Built to conrad-johnson's unmatched standards in parts quality, yet surprisingly affordable - just \$795 for the SC25 line-stage preamplifier (phono-stage optional for \$200), and \$995 for the SA250 power amplifier.

For further information, contact:

**conrad-johnson design, inc.**

2733 Merrilee Dr.  
Fairfax, VA 22031  
phone: 703-698-8581  
fax: 703-560-5360

Enter No. 12 on Reader Service Card



# HARMAN KARDON AVR30 A/V RECEIVER



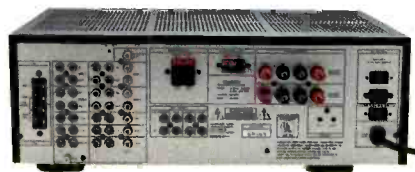
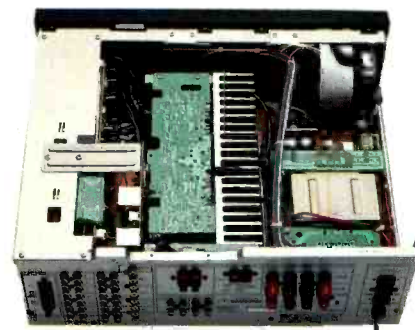
It seems that someone at Harman Kardon has been reading my e-mail. Reading my thoughts might be a better way to put it, since I don't think I've ever expressed this on the Internet. I'm referring to one of my audio/video pet peeves—AVPPs, in this day of acronyms. Everybody has jumped into the A/V receiver market, but few appear to have given much thought to what an A/V receiver really ought to do. Many A/V receivers have too few inputs to handle a real home theater, too little output to power it adequately, and no way to expand the capabilities beyond those that are built in. In this world of look-alike components, where high-quality straight-audio receivers are getting as rare as the proverbial hen's teeth (one of EJF's prime AVPPs!), Harman Kardon's AVR30 audio and video receiver is almost in a class by itself.

As the competition raced out of the A/V starting gate, Harman Kardon seemed stuck in the paddock. It takes time to plan properly, however, and there's nothing like learning from the mistakes of others. With the AVR30, venerable H/K has entered the race with a vengeance. This receiver is reasonably powered across the front (60 watts per channel in stereo, 50 watts in each of the front three in five-channel operation) and marginally so in the rear (with 20 watts per speaker). That's enough to get started right out of the box, but questionable for energizing an advanced home theater. Not to worry, because the AVR30 sports individual line-level outputs for every channel, including ones for dual subwoofers, so that you can tack on additional power amps as your budget permits and control an entire system from it. I can appreciate dual subwoofer outputs (using two strategically placed powered subs helps break up standing waves), but the need for two center outputs mystifies me. Oh, well, I don't look a gift horse in the mouth.

## Control Layout

Having sidestepped EJF's AVPP regarding unexpandable and underpowered A/V receivers, H/K tackles my other oft-voiced complaint: An inadequate array of inputs. The AVR30 offers six A/V inputs ("VCR 1," "VCR 2," "VDP," "SAT," and "TV" on the back panel plus "VCP" for a camcorder or other temporarily connected video source on the front) and five audio-only inputs ("Tape 1," "Tape 2," "AUX," "CD," and "Phono"—all, naturally, on the back). There's also the built-in tuner, which serves as a sixth audio program source and keeps things balanced.

With every tape recorder input (the two for VCRs and two for audio decks) accompanied by a recording output, none of the A/V inputs need be "saved" for audio taping, the cost-saving dodge used by some makers of A/V receivers. In fact, the AVR30's taping facilities are exemplary, with separate "Listen to" and "Rec from" selectors for every audio and audio/video input. Thus, you can dub either an A/V program or an audio program (but not both simultaneously) while listening to or viewing any other. Having separate listening and recording selectors also answers any concern you may have that unpowered recorders will adversely affect sound quality; sometimes they do. The AVR30 also features separate "Simulcast" listening and recording buttons that permit you to view a video source while listening to a different audio source (the "Listen to" control) or to combine disparate audio and video sources



Photos: Michael Groeti

for recording (the "Rec from" control). Note that, although the button is marked "Simulcast," it permits you to combine any audio source with the video, not just the tuner.

The A/V and audio "Listen to" and "Rec from" selectors are neatly arrayed along the bottom of the front panel, with the "Simulcast" buttons on the left and "Loudness" and "Mono" buttons on the right. At the far left is a headphone jack. On the far right are the "VCP" inputs, and above them is a motorized, illuminated "Master Volume" knob. A row of smaller knobs is arrayed above the "Listen to" and "Rec from" selectors: The "Speaker" selector ("Off," "A," "B," "A + B"); "Bass," "Treble," and "Balance" controls, and controls

for "Subwoofer Level," "Center Level," and "Rear Level."

Directly above the level controls are a set of thin buttons. "Audio Direct," on the left, bypasses the surround processor and returns the receiver to conventional audio operation. Next is "Surround Mode," which cycles through the seven available processor modes. Of the three video-oriented modes, the "Pro Logic" function is obvious; H/K's "Movie" mode embellishes on the theme to create the sense of a larger space, while "Sim. Surr." creates a simulat-

ed surround field from monaural sources. Of the four audio modes, "Club" aims to provide the ambience of a small 300-seat venue, "Theater" has additional ambience to provide the sense of a 1,200-seat theater, "Hall" is designed to simulate a 5,000-seat concert hall, and "Stadium," a 20,000-seat arena. All surround modes are generated via digital processing.

Next to the "Surround Mode" control are "Effects Level" buttons ("-" and "+"), the "Center Mode" button ("Wide," "Normal," or "Phantom"), and the "Delay Time" control ("15," "20," or "30" mS). Finally, there is a "Test Tone" button for speaker balancing. The selected mode(s) appear in the display, as does a five-light "Effects Level" array.

Above "Master Volume" are some tuner controls: "FM" and "AM" selectors, a "Seek-Stereo" pad that toggles between seek tuning in stereo and manual tuning in mono, and up/down "Tuning" buttons. To the left of the display are the tuner presets, eight numbered pads and a "Shift A-B" button to choose among any of 16 preset stations, and a "Memory" pad to load stations. At the far left is the "Power" switch. I found H/K's layout intuitively easy to use and attractive in appearance, earning my high accolades.

Two wireless remote controls come with the AVR30. The 66-button system remote handles H/K cassette decks and CD players (as well as the AVR30) in direct fashion, that is, most of their front-panel functions and controls have corresponding pads on the remote. The 41-button Home Theater Controller is preprogrammed with the codes needed to operate many remote-controlled products not made by Harman Kardon, and it comes with its own instruction manual. Each remote has a five-pad array dedicated to the AVR30's on-screen menu system, but the system remote permits you to do almost anything you'd want directly, without wading knee deep through a morass of nested menus (another of EJP's AVPPs!). If the AVR30 is not placed where it can "see" the remote control, you can add an external infrared sensor. It plugs

**HARMAN KARDON'S  
AVR30 A/V RECEIVER  
IS ALMOST IN A CLASS  
BY ITSELF.**

## SPECS

### Amplifier Section

FTC Power Rating, 20 Hz to 20 kHz:

Stereo (both channels driven), 60 watts/channel at less than 0.09% THD into 6-ohm loads; five-channel mode (all channels driven), 50 watts/channel at less than 0.09% THD into 6-ohm loads for front left, right, and center and 20 watts/channel at less than 0.3% THD into 4-ohm loads for rear left and right.

Instantaneous Output Current:  $\pm 40$  amperes.

Negative Feedback: 20 dB.

Frequency Response: 0.5 Hz to 200 kHz, +0, -3 dB.

Slew Rate: 80 V/ $\mu$ S.

Rise-Time: 2.0  $\mu$ S.

Transient IM Distortion: Unmeasurable.

S/N: MM phono, 78 dB; video and CD, 98 dB; both A-weighted re: rated power.

Input Sensitivity/Impedance: MM phono, 2.5 mV/47 kilohms, 125 pF; line, 135 mV/22 kilohms.

Subwoofer Output/Load: 2.0 V/10 kilohms.

Phono Overload: 120 mV.

RIAA EQ Accuracy:  $\pm 0.5$  dB 20 Hz to 20 kHz.

Tone Control Range: Bass,  $\pm 10$  dB at 50 Hz; treble,  $\pm 10$  dB at 10 kHz.

Loudness Contour: +10 dB at 50 Hz with volume at -40 dB.

### FM Tuner Section

Mono Usable Sensitivity: 13.2 dBf.

Stereo 50-dB Quieting Sensitivity: 38.2 dBf.

S/N at 65 dBf: Mono, 80 dB; stereo, 70 dB.

Capture Ratio: 1.5 dB.

Selectivity: Adjacent-channel, 5 dB; alternate-channel, 65 dB.

I.f. Rejection: 85 dB.

AM Rejection: 55 dB at 45 dBf.

Channel Separation: 45 dB at 1 kHz/65 dBf.

THD: Mono, 0.2%; stereo, 0.3%; both at 1 kHz/65 dBf.

### AM Tuner Section

Sensitivity: 18  $\mu$ V, external antenna.

Alternate-Channel Selectivity: 55 dB.

Image Rejection: 40 dB.

I.f. Rejection: 60 dB.

### General Specs

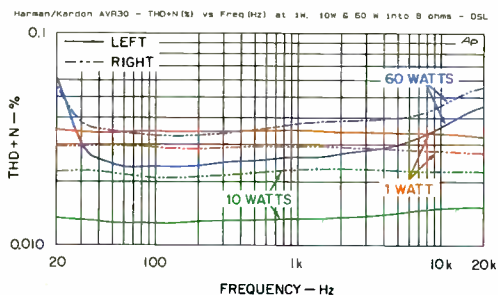
Dimensions: 17 $\frac{3}{8}$  in. W x 5 in. H x 13 $\frac{3}{8}$  in. D (44.1 cm x 12.7 cm x 34.9 cm).

Weight: 19.8 lbs. (9 kg).

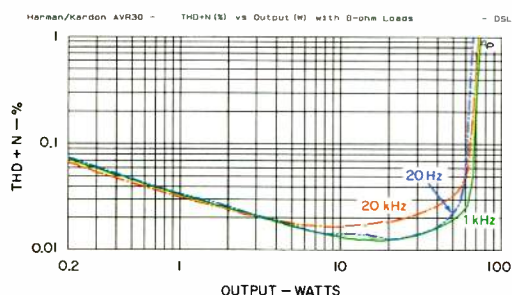
Price: \$1,149.

Company Address: 80 Crossways Park West, Woodbury, N.Y. 11797.

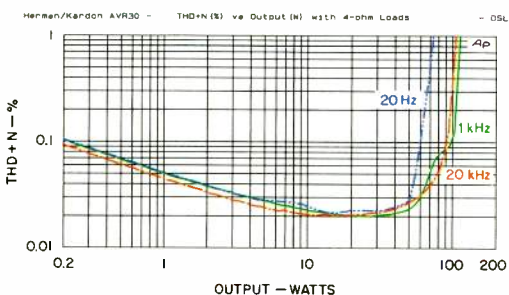
For literature, circle No. 90



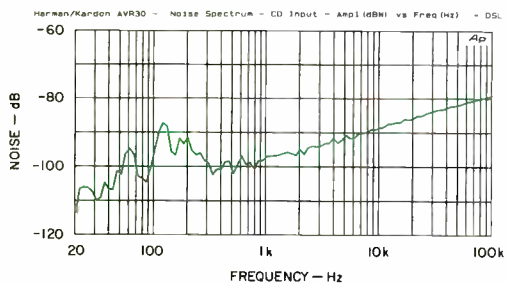
**Fig. 1—Amplifier THD + N vs. frequency.**



**Fig. 2—THD + N vs. output, 8-ohm loads.**



**Fig. 3—THD + N vs. output, 4-ohm loads.**



**Fig. 4—Noise analysis, using CD input.**

into a jack on the back panel, and the “Remote” output jack permits you to daisy-chain other H/K remote-controlled components so that they too can be activated by the external sensor.

### Measurements

Harman Kardon rates the AVR30’s front-channel power for 6-ohm loads and its rear-channel power for 4-ohm loads. Following a more standard procedure, I used 8-ohm loads for most measurements and repeated front-channel distortion-versus-power measurements with 4-ohm loads as well.

In the stereo mode, output power at clipping (1 kHz) was 74 watts per channel (18.7 dBW) into 8 ohms and 110 watts per channel (20.5 dBW) into 4 ohms. With 6-ohm loads, you can expect it to be somewhere between, and obviously well above H/K’s 60-watt/channel rating. On a dynamic basis (IHF tone burst), maximum output per channel was 85 watts (19.3 dBW) and 130 watts (21.1 dBW) into 8- and 4-ohm loads, respectively.

THD + N versus frequency at 1, 10, and 60 watts (8-ohm loads) is shown in Figure 1. Although the 60-watt curves turn upward at very low frequencies (indicating some lack of power-supply filtering), distortion never approaches H/K’s 0.09% tolerance. Figures 2 and 3 show distortion versus output at 20 Hz, 1 kHz, and 20 kHz with 8- and 4-ohm loads, respectively. (The data shown is for the left channel, but the right channel’s performance was similar.) Below 50 watts with 8 ohms or 10 watts with 4 ohms, THD + N is essentially noise-limited; distortion doesn’t kick up until above 50 watts in either case. With 4-ohm loads, the rather abrupt rise in 20-Hz distortion above 50 watts confirms my opinion that larger power-supply filter caps would be beneficial. This is further confirmed by the noise analysis (Fig. 4), which reveals a dominant component at 120 Hz,

the power-supply ripple frequency. But let’s not make too much of this. The AVR30 easily meets its specifications!

Front-channel damping factor (50 Hz) was just shy of 100, and output impedance remained low across the entire audio band, rising from 82 milliohms at 1 kHz to 135 milliohms at 20 kHz. I attribute this to H/K’s long-standing penchant for fast output stages with low negative feedback. (Harman Kardon specifies the slew rate at 80 V/μS, with a rise-time of 2 μS and a feedback factor of 20 dB.) I have come to associate constancy of output impedance with good sound, and the AVR30 reinforced my opinion in this regard because it sure does sound good.

The AVR30’s wide bandwidth is demonstrated in the response curves of Fig. 5. Phono response (including basic amplifier response) is up approximately 0.5 dB at 20 kHz and 1.25 dB at 20 Hz. From the CD input, response is within about ±1 dB from

**THE AVR30 REINFORCED  
MY OPINION THAT  
CONSTANT OUTPUT  
IMPEDANCE IS LINKED  
TO GOOD SOUND.**

10 Hz to 100 kHz (down about 3 dB at 200 kHz); the slight low-frequency boost is undoubtedly due to the tone-control circuitry, which cannot be defeated. Bass and treble actions hinge just below 1 kHz and shelf to a maximum range of about ±11.75 dB at the frequency extremes (see Fig. 6). At 50 Hz and 10 kHz, the range is approximately ±10.5 dB. The loudness contour (also Fig. 6) boosts bass response by 8.6 dB at 100 Hz, 9.6 dB at 50 Hz, and 10 dB at 20 Hz.

Input impedances (26 kilohms for the CD input, 48 kilohms plus 135 pF for MM phono) were well chosen, as was IHF sensitivity (19 mV for CD and 0.375 mV for MM phono). Rated output was reached with a 147-mV CD input or a 2.9-mV (1-kHz) phono input. Input overload points (1 kHz) were a relatively generous 150 mV on the phono terminals and 7.6 V on the CD jack. Channel balance was within ±0.16 dB. All of this data meets or exceeds

# CONRAD-JOHNSON PF2 AND MF2300

Solid-State Components Without Solid-State Sound

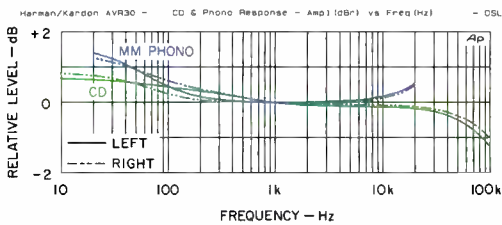
Too often, solid-state audio components sound harsh, edgy, grainy, and dimensionless. This is so common among solid-state designs that audiophiles readily identify this unmusical sonic signature as "transistor sound". At Conrad-Johnson, we have long believed that these audible distortions are not inherent in solid-state devices. Instead, they are a consequence of circuit design and implementation. Through innovative circuit design and the use of highest quality parts, we have developed a range of Conrad-Johnson solid-state products that prove the point. They do not sound like solid-state. They just sound like music.



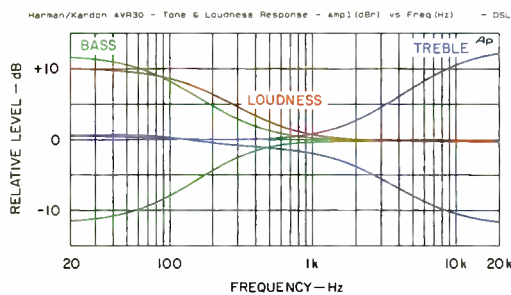
For more detailed information on the full range of Conrad-Johnson solid-state products write, phone or fax:  
conrad-johnson design, inc.

2733 Merrilee Drive • Fairfax, VA 22031 • phone: 703-698-8581 • fax: 703-560-5360

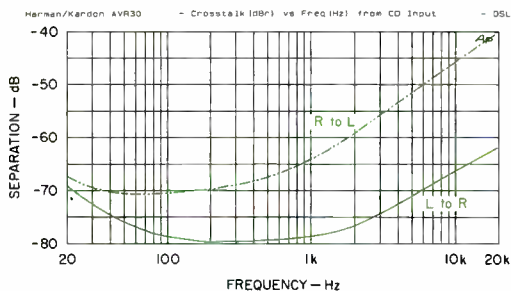
Enter No. 13 on Reader Service Card



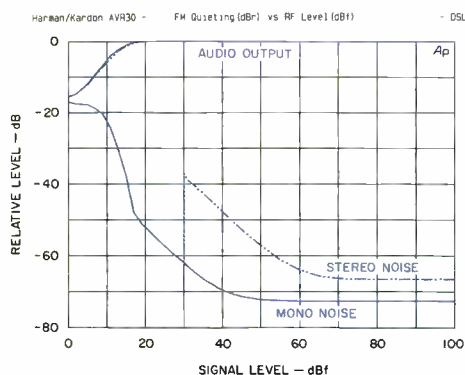
**Fig. 5—Amplifier frequency responses.**



**Fig. 6—Tone-control range and loudness contour.**



**Fig. 7—Front-channel separation, CD input.**



**Fig. 8—FM quieting characteristics.**

H/K specifications, within the limit of experimental error.

So does A-weighted noise, which clocked in at  $-81$  dBW from the CD input and  $-76.8$  dBW from the MM phono input. Referenced to rated power, these figures translate into S/N ratios of 98.8 and 94.6 dB, respectively.

Output levels at the recording jacks measured 0.47 V from a 0.5-V CD input (essentially unity gain), 0.24 V from a 5-mV, 1-kHz phono input, and 0.74 V from a 100% modulated FM broadcast. Output impedance at the recording jack was 1,500 ohms. All in all, there should be no problem interfacing to tape decks.

Crosstalk (Fig. 7) is asymmetric, with left-to-right separation better than right to left. Although not stellar as measurements go, I'm hard pressed to believe that better results would produce better imaging.

FM quieting curves for mono and stereo are shown in Fig. 8. By 18.2 dBf, the tuner is in full limiting and mono quieting passes through the 50-dB benchmark. The tuner switches to stereo at about 30 dBf, with a quieting factor of 38 dB. In stereo, 50-dB quieting is attained with a 42.2-dBf input. Signal-to-noise ratio at 65 dBf measured 72.7 dB in mono and 65.7 dB in stereo.

Figure 9 shows tuner THD + N versus frequency at 65 dBf. Mono distortion is no greater than 0.1% up to 1 kHz and rises to 0.16% at 6 kHz. Stereo distortion remains under 0.75% from 100 Hz to 2.8 kHz and clocks in at 1.7% at 6 kHz and 0.58% at 1 kHz.

Capture ratio (1.5 dB) was on spec, adjacent-channel selectivity (6.9 dB) was better than spec, and alternate-channel selectivity (61 dB) was close to spec. The tuner's AM rejection (61 dB) was better than H/K claims, and image rejection was 49 dB. The 38-kHz stereo subcarrier was well suppressed (70 dB down) at the tape

recording output, where it counts; the 19-kHz pilot signal was somewhat less so (37.5 dB).

Figure 10 is a composite of the FM-stereo response and separation curves together with the AM tuner response. Close examination of the FM data reveals smooth response ( $\pm 0.3$  dB from 20 Hz to 15 kHz) and excellent separation (38 dB minimum from 60 Hz to 15 kHz). The AM response is par for the course except that it's more extended on the low end than is typical. Overall, the AM tuner is within  $+2$ ,  $-3$  dB from 20 Hz to 2.2 kHz and is down 6 dB at 3.5 kHz.

The above data was taken by treating the AVR30 as a stereo-only receiver. In the

**THE DOLBY PRO LOGIC  
PROCESSOR DOES  
A GREAT JOB VIS-À-VIS  
DISTORTION, RESPONSE,  
AND DYNAMIC RANGE.**

five-channel Dolby Pro Logic mode, I measured, at 1 kHz, a front output power of 70 watts per channel (18.5 dBW) with the left and right channels driven to simultaneous clipping and a center-channel output of 85 watts (19.3 dBW) when it was driven alone. Power to the rear, at 1 kHz, was 25 watts (14.0 dBW) per channel at the clipping point. All of these measurements were taken with 8-ohm loads.

The A-weighted noise was  $-79.0$  dBW in the front-left channel,  $-78.3$  dBW in the center ("Wide" mode), and  $-71.4$  dBW in the rear. Signal-to-noise ratios, referred to the clipping points, were thus calculated to be 97.5 dB (front), 97.6 dB (center), and 85.4 dB (rear). If you compare the front-channel data with the data taken in the stereo mode, you'll find that the AVR30 has almost the same dynamic range when using Dolby Pro Logic as when not. Often that's not the case!

Distortion with Pro Logic processing is always higher than without it because of the processor action. The data taken on the AVR30 is shown in Fig. 11. The curves were taken at output levels of 50 watts for the three front channels and 10 watts for each rear channel. (The left and right

# DAZZLING!

PARADIGM ESPRIT | B P

**PARADIGM Bipolar Speakers**  
set the highest standard  
of technological excellence  
and deliver breathtaking  
performance!

*"A true high end speaker... there's literally  
nothing else on the market at anywhere near  
the retail... which combine this level of  
sound quality, accuracy and wide smooth  
frequency response."*

*Andrew Murr-Jur L. Audio Ideas Guide*

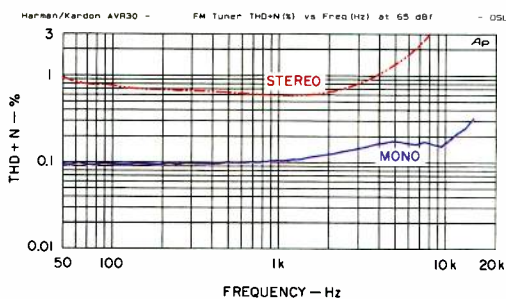
*"stunning image... astounding front-to-back  
layering... performs as well as one would  
expect from speakers in twice the price  
range—simply marvelous... have a listen  
to these gems."*

*The Loudspeaker Report*

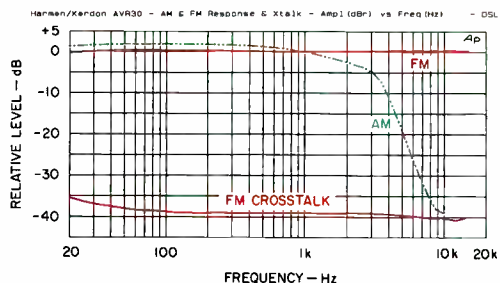
**Paradigm®**

For more information visit your nearest AUTHORIZED PARADIGM DEALER  
or write: AUDIOSTREAM, MPO Box 2410, Niagara Falls, NY 14302  
In Canada: PARADIGM, 101 Mantlan Rd., Woodbridge, ON L4L 3K1

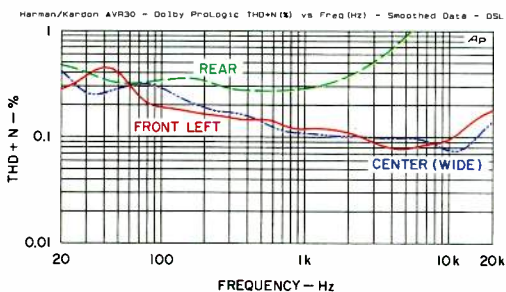
Enter No. 32 on Reader Service Card



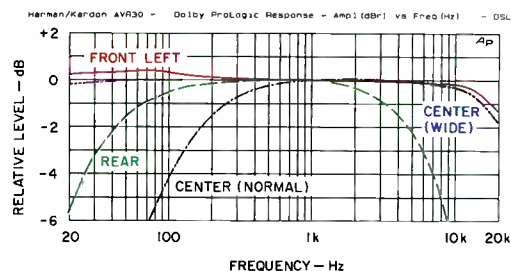
**Fig. 9—FM THD + N vs. frequency.**



**Fig. 10—FM frequency response and separation, and AM frequency response.**



**Fig. 11—THD + N vs. frequency, Dolby Pro Logic mode.**



**Fig. 12—Frequency responses, Dolby Pro Logic mode.**

front-channel curves were similar, so I plotted only the left.) Distortion data taken on Pro Logic processors depends on the precise frequencies used; therefore, I mathematically “smoothed” the curves to show the trends more clearly. Rear-channel distortion is higher than in the front (which is usually the case), but it’s reasonable to assume that the rise in rear-channel distortion above a few kilohertz is caused more by the roll-off in fundamental level demanded by the Dolby Standard than by an increase in harmonic strength per se. Compared with other processors, the AVR30’s does a fine job indeed!

Figure 12 is a composite of the response curves taken on the various channels using Dolby Pro Logic processing. Rear-channel response rolls off at both ends of the spectrum, being down 1 dB at 70 Hz and 3.3 kHz, down 3 dB at 32 Hz and 6 kHz, and down 5.7 dB at 20 Hz. This is pretty much in accordance with Dolby lore. In the “Wide” mode, center-channel response is flat from 20 Hz (–0.2 dB), with a –1 dB point at 16 kHz; it is down 1.8 dB at 20 kHz. Center-channel “Normal” operation rolls off the lows and redirects the energy to the left and right front channels. In this mode, response is down 1 dB at 250 Hz, down 3 dB at 130 Hz, and down 6 dB at 73 Hz, again pretty much on Dolby targets. Front-channel response is a tad more extended on the high end (–1 dB at 17.4 kHz and –1.4 dB at 20 kHz) and exhibits a slight low-end boost of 0.4 dB at 70 Hz.

The AVR30’s Dolby Pro Logic processor does a great job vis-à-vis dynamic range, distortion, and response. Static separation at 1 kHz was even more extraordinary, ranging from a low of 49.7 dB (right front to center) to upwards of 63 dB(!) between center and rear, right front and left front, and rear to left front. Most of the other possible combinations exhibited separation in the 50-dB range. That’s outstanding! A quick check of the AVR30’s

video switching indicated negligible insertion gain or loss (0.1-dB gain) and response that was flat within +0, –1 dB from 500 kHz to 4.2 MHz, the upper end of the NTSC spectrum.

#### Use and Listening Tests

Okay, compared with a few competing A/V receivers, the Harman Kardon AVR30 is not exactly overpowered; in the rear, you can even say it’s marginally powered. So why do I like it so much? (1) Because it sounds so good, both on music and on video programs; (2) because its weaknesses are easily fixed, either by using highly efficient rear speakers or by adding a few power amps; (3) because it has a Dolby Pro Logic decoder whose performance rivals that of many more expensive outboard

**HARMAN/KARDON  
DID ITS HOMEWORK  
AND DID IT WELL,  
OBVIOUSLY LEARNING  
FROM OTHERS’ MISTAKES.**

processors; (4) because it will accommodate so many A/V sources and has such a complete array of line outputs that it can be expanded almost without limit and is unlikely to become obsolete in the near future; (5) because it has great ergonomics, intuitive labelling, and can be used with or without those (infernal!) nested menus, and (6) because I don’t know of a better buy for \$1,149.

Sure, I would have liked some things done differently—defeatable tone controls, beefier filter capacitors in the power supply, more oomph in the rear, S-video connectors, gold-plated pin jacks, etc.—but the AVR30 is quite usable “out of the box” and so intuitively simple that, if you’re familiar with home theater operation, you may not even need to read the well-written manual. When you change DSP settings, the AVR30 retains what you’ve done and the program source you did it for. Select that source again, and the latest settings load automatically. Unique? Not really, but nice. Another sign that Harman Kardon did its homework and did it well!

*Edward J. Foster*



# SONY *style*

your personal guide to consumer electronics

gifts

**Everyone  
Deserves  
a Sony...**

**Any Sony  
Product Makes  
the Perfect  
Holiday Gift!**

**...And Sony  
Has a Gift  
for You!**

**Special Gifts  
With Product  
Purchase!**

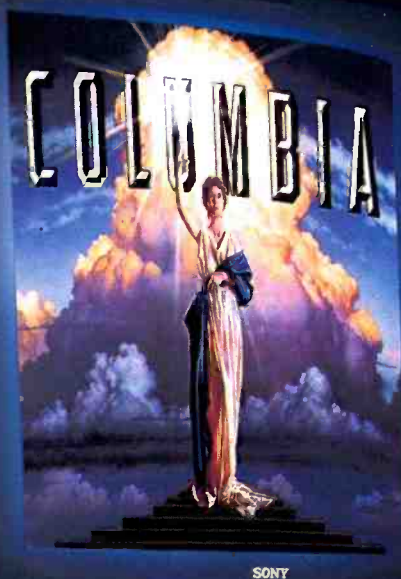
**SONY**



# welc

...to your holiday preview of Sony Style Gifts.

IT'S YOUR PERSONAL GIFT GUIDE to consumer electronics. Your gateway to a world of spectacular innovations and special offers. In this holiday season, there's no more exciting gift than a Sony. From complete A/V home entertainment systems, to compact portable stereos, Sony does it all—and does it in style. You'll find a Sony that's perfect for everyone on your list. Including, of course, hints for gifts you'd like to get yourself!



LOOKING FOR A SONY DEALER? CALL 1-800-342-5721

# ome

SONY gifts

## AV home entertainment

➤ You've seen big-screen A/V systems in movies—and maybe, in your dreams. Now, 'tis the season to experience it for yourself: a Sony audio/video entertainment system. Improve your image with an unsurpassed Trinitron® or Trinitron XBR TV picture. Or discover the truly spectacular performance of a Videoscope® Big Screen TV—most with ultra slim cabinetry that takes up only about the same floor space as a standard 20" TV. Add a Sony Theater Sound System for instant Surround Sound. Power up your movies with a Sony VHS Hi-Fi Stereo VCR. Add a superb Sony A/V Receiver, with Dolby Pro Logic™ decoding—then sit back. Relax. Enjoy the big show.



KP-41EXR96



STR-D1015



SLV-770HF



SA-VA1

THIS YEAR, IT'S OUR TRINITRON® 25TH ANNIVERSARY SEASON — time to give a Sony TV your own personal tryout. In fact, Sony television has been named the TV of Choice of the NFL.™ To celebrate, Sony dealers will be stirring up lots of excitement with all-star promotions. You can even receive a free book with your purchase of a Videoscope® Big Screen TV between October 31, 1994, and January 31, 1995: **75 Seasons**, the big, handsome hardcover history of the NFL. It makes a great gift, for yourself or your favorite fan—and Sony-style picture and sound will also give you the next best thing to a stadium seat for all the big games.

SONY



SONY gifts

KV-32V15



KV-27V15



KV-20V50



KV-13V50



Sony television

the whole world is watching

Over the busy holiday season, a little Trinitron TV can come in handy—in your kitchen, home office, anywhere at all. The KV-9PT40 delivers a bright color picture in a white cabinet... with a matching white remote. Sony's V-series Trinitron TVs bring home more excitement with vivid detail, powerful sound, and sleek, compact styling — in screen sizes ranging from 15"–32". For the ultimate in big-screen holiday entertainment, Sony Videoscope Big Screen TV delivers images so big, bright, and clear, they pull you right into the action. Our KP-53XBR35 53" Videoscope model has Pro-Optic™ system technology and Advanced Digital Picture-In-Picture—all in a compact cabinet you can custom-install.



KV-9PT40

KP-53XBR35



LOOKING FOR A SONY DEALER? CALL 1-800-242-5721

SONY

SONY STYLE  
IS YOUR STYLE

Exciting. Ingenious. Out on the cutting edge of technology...and unsurpassed in performance. Sony high-fidelity products deliver today's most exciting audio entertainment in all its glory—and with infinite variety, wherever and whenever you want it. From ultra-compact bookshelf stereos, to full rack systems, to individual components that deliver the ultimate in audio reproduction, Sony has it all—and brings it all home with remarkable ease.



LOOKING FOR A SONY DEALER? CALL 1-800-345-1721

CDP-CX151



▶ A hundred CDs at your fingertips? Pick a song, push a button, and it's yours—with fantastic, full-spectrum audio fidelity. Your Sony CDP-CX151 100-Disc Changer loads a complete CD music collection for remote-control access. Custom File™ memory lets you program disc information for display, and Group Memory lets you group discs by category, mood, or listener. Our STR-D1015 A/V Receiver makes the perfect holiday companion: audiophile features like Parallel Push-Pull discrete-amplifier design, Dolby Pro Logic® Surround Sound for spectacular movie soundtracks, and a Programmable Remote Commander® unit that makes total A/V system control a snap.

big sound, simple system



STR-D1015



FOR VIDEO HITS (both home and Hollywood), Sony 8mm video is an unbeatable system. Home videos are easy to shoot, edit, and play back on any TV. For Hollywood hits, you've got hundreds of titles to choose from. And to start your collection, Sony gives you three free 8mm movies when you buy a Sony CCD-SC5 or CCD-FX730V Handycam camcorder, any Sony 8mm VCR, or any Sony Video Walkman™ VCR/TV between October 1 and December 31, 1994. Don't miss the year's best triple feature!



CCD-TR700



LOOKING FOR A SONY DEALER? CALL 1-800-342-5721





## a camcorder holiday

► The holidays slip by quickly—so capture your memories with a Sony Handycam® camcorder. Grab a compact TR-Series model, like the CCD-TR700 with Hi8™ high-resolution picture quality and hi-fi stereo sound—plus SteadyShot™ stabilization, which minimizes picture shake without degrading the image. Or go for an FX-Series model like our new CCD-FX730V, with flip-out 3" color LCD screen and built-in speaker—so the whole family can enjoy instant playback anywhere.

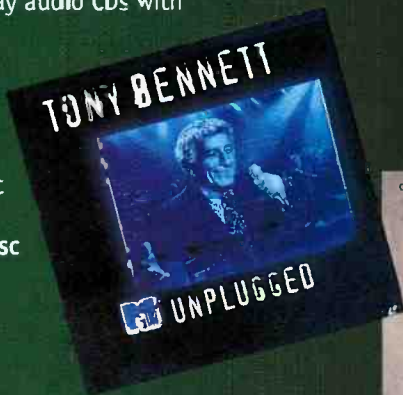


SONY gifts

SONY AV LASER™ MULTI DISC PLAYER™ COMPONENTS are the perfect medium for serious video collectors. And for long-lasting playback of kids' programs, and music videos you'll watch over and over again. Models like the MDP-500 add a new dimension to all your entertainment with up to 425-line horizontal resolution, digital audio sound, and quick, random access. They also play audio CDs with spectacular fidelity! And, if you purchase any Sony AV Laser player before March 31, 1995, we'll start your library with two free Laserdisc selections: one music, one movie.

MDP-500

SONY



movies and music  
with added dimension

ASK YOUR SONY DEALER FOR DETAILS.

SONY gifts

SLV-7701R

SONY

POWER

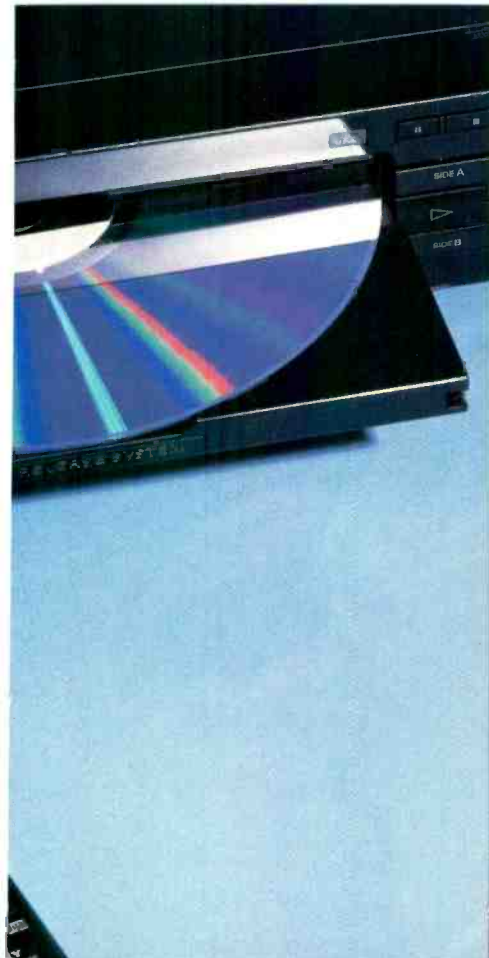
EJECT

CABLE BOX CONT

SP



LOOKING FOR A SONY™ DEALER? CALL 1-800-42-5721



magic in every  
movie you rent

► The magic is sound: room-filling stereo sound that makes movies you rent feel so much bigger than your TV screen. Magic no ordinary VCR can deliver. Only America's best-selling HiFi Stereo VCRs - like the Sony SLW-770HF HiFi Stereo VCR - will help you see and hear all you've been missing, and open your eyes to amazing new convenience. Auto Clock™ Set gives you a VCR clock that actually sets itself (where available through TV broadcast). The Sony Shuttle™ dial is a simple, fun way to operate VCR functions. VCR Plus™ makes timer recording easy - and our



AutoClock VCR

Cable Mouse® system lets you change channels on your cable box with your VCR remote or programmable timer.

HiFi Stereo

SYSTEM/ADAPTIVE PICTURE CONTROL

AUTO TRACKING APC STEREO  
4:42 PM

VCR Plus+

HIGH PRECISION CENTER MECHANISM

HI-SPEED REWIND

PAUSE



TIMER REC

VIDEO CASSETTE RECORDER SLW-770HF VHS

It's the ideal medium for in-car listening: Sony MiniDisc. You can load up to four discs in an in-dash MDX-400 MiniDisc changer—and never have to worry about rough roads, because Shock Resistant Memory keeps your music running smoothly. While loading your car, check out the new Sony in-dash XR-C410 AM/FM Stereo Cassette Receiver/CD controller, CDX-5270 in-dash AM/FM Stereo CD Player, and EXM-302 125-watt MOSFET amplifier... then hit the road in Sony style!



unbeatable street sounds

SONY gifts

XR-C410



CDX-5270



SONY AUTOSOUND COMPONENTS are the moving equivalent of concert-hall fidelity—the state of the art in high-performance highway listening. And driving with MiniDisc is an unforgettable experience. In this holiday season, Sony is giving away MiniMoney: buy select Sony MiniDisc players before March 31, 1995, and you'll get MiniMoney coupons redeemable for **up to \$300 in free MiniDisc music!** Check your dealer for details.



EXM-302

SPP-A5000



SPP-2010

SPP-X90  
TAM-2000



IT-ID500



IT-W20



Sony calling

► The message is clear: Sony telecommunications products have great features, sleek designs, and superior performance. It's your call: SPP-2010 Cordless Phone with dual battery system, IT-ID500 Caller ID Display Phone, IT-W20 Wall Telephone, SPP-A5000 Cordless Telephone with built-in Answering Machine or TAM-2000 Digital Answering Machine. Buy a Sony SPP-2000 or SPP-2010 Cordless Phone between October 1 and December 31, 1994, and you'll receive a Sony Prepaid Phone Card—for up to 30 minutes of toll-free calling anywhere in the continental U.S!



LOOKING FOR A SONY DEALER? CALL 1-800-342-5721

PERSONAL, PORTABLE, POWERFUL... Looking for a perfect last-minute gift idea? Look to Sony, the name that changed the way the world listens to music. Choose our MZ-R2 portable MiniDisc Player/Recorder, D-828K Car Discman® CD player, splash resistant D-421SP Sports Discman CD Player, or WM-SXF44 stereo cassette/AM/FM tuner with Action Grip design-then select the lucky person on your list.



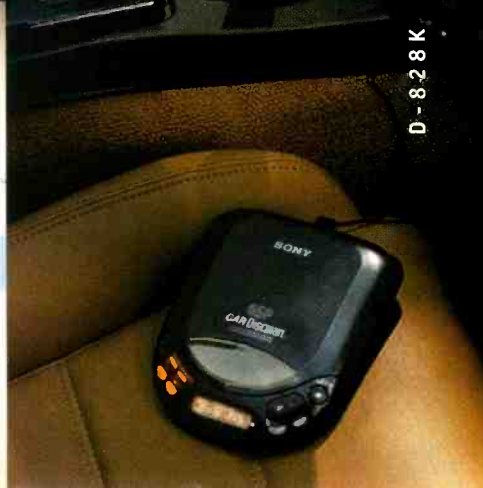
MDR-55



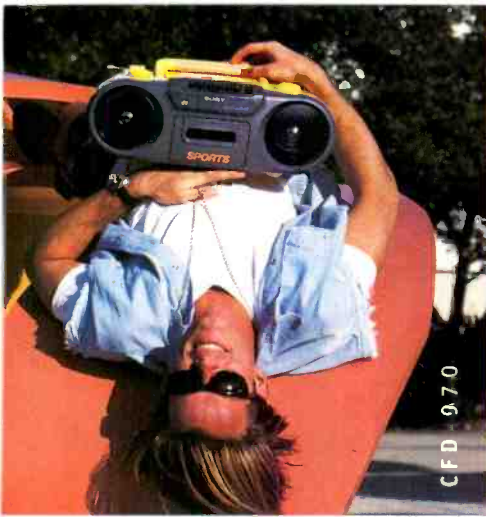
D-421SP



MZ-R2



D-828K



CFD-970

MDR-IF410K



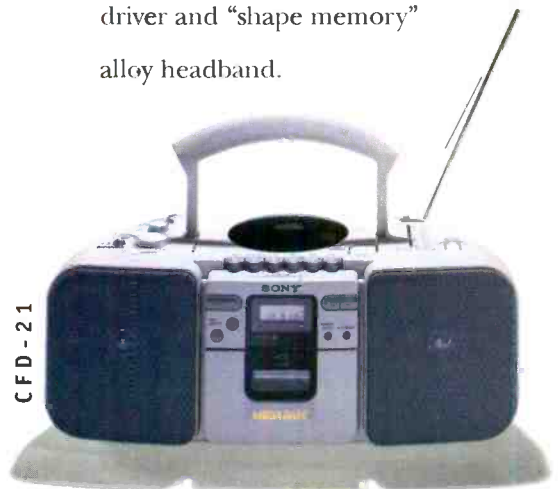
WM-SXF44

sound gift suggestions



► Everybody likes music—especially when it’s easy to carry. For portable component listening, choose the 1-piece Sony CFD-970 Sports CD/cassette/AM/FM stereo with Mega Bass® sound...or the affordable CFD-21 CD player with AM/FM stereo, in striking white design. And don’t forget another Sony innovation: comfortable hi-fi headphones. The MDR-IF410K infrared headphone system, for wireless listening...or the MDR-55, with eardrum-facing Auranomic driver and “shape memory” alloy headband.

CFD-21



LOOKING FOR A SONY DEALER? CALL 1-800-342-5721

**Sony Style: over 600 more ingenious gift ideas.** No company has introduced more high-technology electronic innovations than Sony. Now, there's a great way to keep up with all the latest, greatest Sony ideas in TV, video, hi-fi, telecommunications, and more: **Sony Style magazine.** It's a full-color guide to over 650 Sony products—plus in-depth information on technology, features, even how-to hints on setting up systems. It's yours for just \$4.95, plus \$1.50 shipping and handling. Our current issue features all the products you've seen here...and also advance information on upcoming Sony Pictures movies and Sony Music releases!

**SONY**

in-depth information on technology, features, even how-to hints on setting up systems. It's yours for just \$4.95, plus \$1.50 shipping and handling. Our current issue features all the products

you've seen here...and also advance information on upcoming Sony Pictures movies and Sony Music releases!



**Order by mail**

I want Sony Style magazine. Please send me the latest issue of Sony Style at \$4.95, plus \$1.50 shipping and handling per issue. (New Jersey residents add 6% sales tax).

To receive your Fall issue:

Please make check or money order payable to Hann & DePalmer and send to: Sony Style Magazine, P.O. Box 9500, Cranbury, NJ 08512-9929

Payment enclosed with this coupon

Magazine[s] Total	Sony Style is \$4.95 per issue. Please allow 3-4 weeks for delivery. Offer expires 4/95.
Shipping and Handling	
NJ residents add 6% sales tax	
<b>TOTAL</b>	

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

**Order by phone**

with your Visa or MasterCard. Call:

**1.800.848.SONY**

©1994 Sony Electronics Inc. Reproduction in whole or in part without written permission is prohibited. All rights reserved. All television screens are measured diagonally; all insets contained herein are simulated television pictures only. Sony, AV Laser, Custom File, Discman, Dynamic Acoustic Chamber, Handycam, Hi8, Mega Bass, MiniDisc (logo), Multi Disc Player, Pro-Optic, Sony (logo), Remote Commander, SteadyShot, Trinitron, XBR, Videoscope, and Walkman are trademarks of Sony. Dolby and Pro Logic are trademarks of Dolby Laboratories Licensing Corporation. VCR Plus+ is a trademark of Gemstar Development corporation.



## KEF Q70 SPEAKER

The “Q” in the Q70’s model number stands for KEF’s Uni-Q two-way coincident driver, which places a small tweeter right at the inside base of the midrange driver’s cone, where it also acts as a dust cap. Since reviewing this British company’s high-end Reference Series Model 105/3 speaker (which will be replaced shortly by the Model Three) for the June 1993 issue, I’ve wished for a more moderately priced Uni-Q speaker, one that a humble working person might afford. The KEF Q70 is just such a system.

When I first unpacked the Q70s and did some preliminary looking and listening, I guessed a retail price of around \$1,800 per pair. The actual price is a significantly lower \$1,100 per pair! Because of the Q70s’ potential high performance, coupled with their low price, I was quite interested in running them through their paces. (I reviewed another moderately priced concentric design in the August 1992 issue, the \$1,599 per pair Tannoy 615, which has since been discontinued).

The Q70 is at the top of KEF’s “affordable” Q-series line, all four models of which utilize a 6½-inch Uni-Q driver as their mid/bass and high-range radiator. All are magnetically shielded to suit home theater applications and have a bold contemporary look, finished in simulated black ash or in video gray.

The Q70 is a floor-standing, three-way/four-driver system that uses the Uni-Q 6½-inch coaxial driver to reproduce all frequencies above 400 Hz. The lower frequencies are generated by a pair of parallel-connected 6½-inch cone woofers mounted in two separate vented enclosures, in a configuration that the manufacturer calls a “differentially tuned twin bass reflex” loading system.



in the center of a cone midrange. The tweeter is quite small because of the use of a high-energy, rare-earth magnet, and is actually mounted inside the voice-coil former of the midrange, near the apex of the cone. This configuration is said to make the radiation from the tweeter and midrange coincident in both time and space, which effectively provides a two-way driver that behaves as a single coherent source of sound, providing uniform coverage over a wide but controlled region. The midrange cone acts as a waveguide for the tweeter, which controls its radiation and helps to match each driver’s coverage pattern at crossover. The result is very even coverage in the listening area for both seated and standing listeners. Like the 105/3, the Q70 is designed to have wide but controlled coverage that improves imaging by minimizing side-wall and

floor/ceiling reflections that might otherwise interfere with the sound.

The Q70’s tweeter has a neodymium-iron-boron magnet and is magnetic-fluid cooled to minimize thermal compression and to increase power handling. The midrange and woofers of the Q70 use a specially shaped polypropylene cone designed to deliver a wide response, free of breakup and resonance distortions. In addition, both woofers have high excursion capabilities. KEF manufactures all of its own drivers.

**THE Q70s ARE ACTUALLY  
LESS EXPENSIVE  
THAN THEIR APPEARANCE  
AND SONICS SUGGEST.**

The Q70’s mid and high frequencies are radiated by a single 6½-inch coaxial driver composed of a soft-dome tweeter mounted

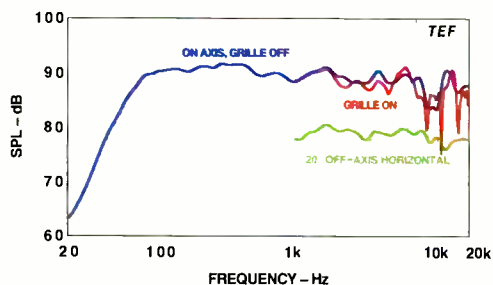


Fig. 1—One-meter frequency responses.

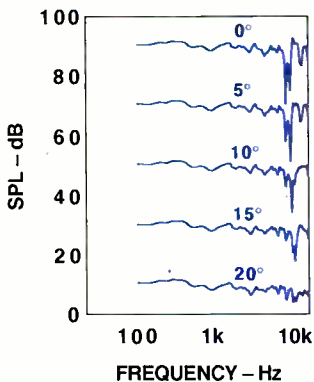


Fig. 2—Horizontal off-axis frequency responses.

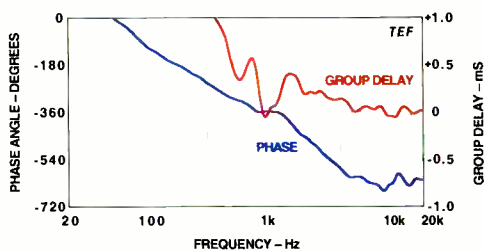


Fig. 3—On-axis phase response and group delay.

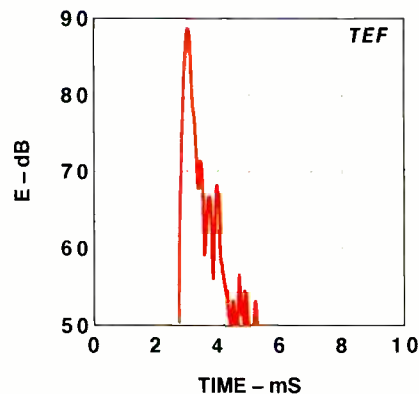


Fig. 4—Energy/time response.

The Q70's parallel-connected, front-firing woofers are mounted in separate, but different-sized, reflex enclosures which are vented to the front through identical port tubes. The different enclosure sizes (the bottom enclosure is 0.62 cubic foot, while the top is 0.4 cubic foot) thus tune the two vented boxes to different frequencies, which theoretically should be about a third of an octave apart. The dissimilar tunings are said to avoid one dominating resonance in the bass range.

The two woofers and two ports on the front panel form a distributed bass radiation arrangement that KEF claims makes the speaker less sensitive to room location and minimizes floor bounce. The internal subdivision of the enclosure into separate compartments also stiffens the cabinet, potentially reducing cabinet resonances and internal standing waves. KEF calls this configuration "differentially tuned distributed bass loading."

The crossover board of the Q70 is mounted behind the bottom woofer, and all of its parts are of high quality. The crossover contains 13 components (four resistors, four inductors, and five capacitors), forming a second-order, low-pass network for the woofers, a fourth-order bandpass for the midrange, and a third-order high-pass for the tweeter. Conjugate impedance-compensation networks are used on both the woofers and the midrange. Two sets of gold-plated input terminals are provided on the rear for bi-amplified or bi-wired connections; gold-plated straps are provided for conventional hookup.

Each Q70 is supplied with a molded plinth base that increases the system's footprint and thus improves cabinet stability. Spikes and self-adhesive rubber feet are both supplied for mounting the system on different floor surfaces.

The cabinet of the Q70 is solidly constructed of 5/8-inch medium-density fiberboard. Three separate

and identical injection-molded grille frames, held in place by pegs, are used on the front panel. The top grille, which only covers the Uni-Q driver, may be easily removed for unimpeded listening.

## Measurements

Figure 1 displays the anechoic frequency response of the Q70 with and without the top grille. Also shown is a 20° off-axis horizontal response without the grille. These measurements were taken 2 meters away from the speaker, on the Uni-Q axis, with a voltage of 5.66 V rms. Referenced back to 1 meter, all curves—except the one with the grille—are 10th-octaves smoothed.

Without the grille, the response is quite flat from 69 Hz to 9 kHz and fits a tight, 3.0-dB window. Above 9 kHz, however, the response is somewhat rougher and exhibits a 6-dB dip, half an octave wide, at 11 kHz and a peak (actually, a return to normal) at 13.5 kHz. In the bass, the response is 3 dB down at 63 Hz (referenced to the 100-Hz level) and down 10 dB at 42 Hz.

## SPECS

**Type:** Three-way, "Uni-Q" coincident source, floor-standing, differentially tuned, twin bass-reflex system.

**Drivers:** Two 6½-in. cone woofers and 6½-in. cone midrange with coaxially mounted ¾-in. soft-dome tweeter.

**Frequency Response:** 45 Hz to 20 kHz, ±3 dB.

**Sensitivity:** 90 dB at 1 meter, 2.83 V rms applied.

**Crossover Frequencies:** 400 Hz and around 2.9 kHz.

**Nominal Impedance:** 6 ohms.

**Recommended Amplifier Power:** 10 to 175 watts per channel.

**Dimensions:** 40 in. H x 7½ in. W x 10¾ in. D (101.8 cm x 19 cm x 27.3 cm).

**Weight:** 37.2 lbs. (16.9 kg) each.


**Price:** \$1,100 per pair; available in simulated black ash or in video gray.

**Company Address:** 89 Doug Brown Way, Holliston, Mass. 01746.

For literature, circle No. 91

HERE'S A "SOUND" REASON  
TO BUY A NEW FORD CONTOUR  
OR MERCURY MYSTIQUE.



 Ford Contour

 Mercury Mystique

*THINK OF IT AS  
YOUR HOME CD SYSTEM...  
AWAY FROM HOME.*

*I*n fact, you have a choice of "sound" reasons, such as the AM/FM Stereo CD radio with Premium Sound. Or choose the dealer-installed CD player or trunk-mounted

10 disc CD changer. Any of these options enables you to take your home CD library with you and enjoy the same high-quality music that you are accustomed to hearing



*10 disc changer*

at home. Ford Electronics engineers have designed audio system components to complement each other and deliver a "live" performance sound bringing you more enjoyment per mile. So

when you purchase your new

Ford Contour or

Mercury Mystique, make sure you ask for the AM/FM stereo CD radio with Premium Sound or a dealer-installed CD player... it's worth every decibel.



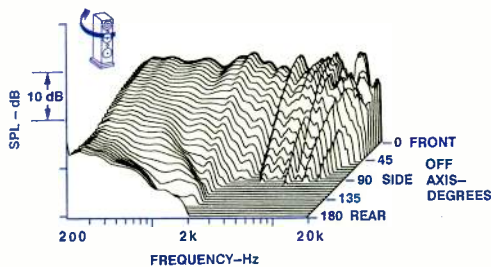


Fig. 5—Horizontal off-axis frequency responses.

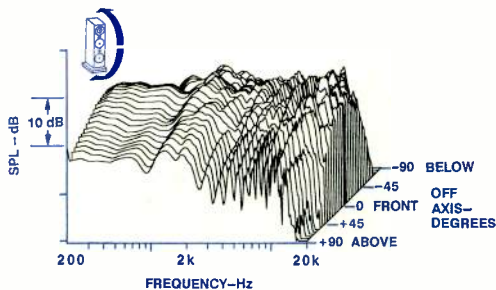


Fig. 6—Vertical off-axis frequency responses.

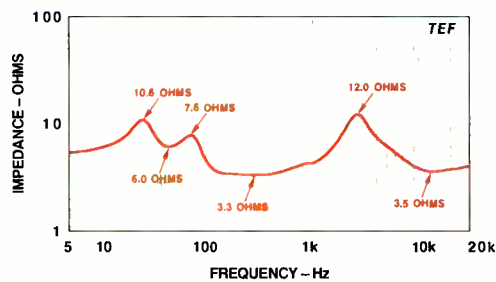


Fig. 7—Impedance.

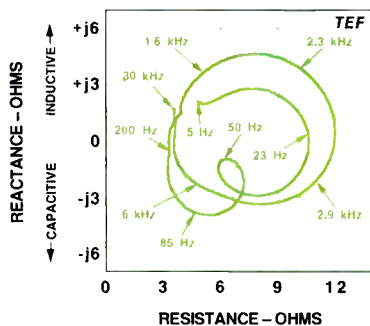


Fig. 8—Complex impedance.

With the top grille on, the response exhibits moderate roughness between 2 and 8 kHz and higher deviations at higher frequencies. I therefore suggest leaving this grille off for the most serious listening.

Averaged over the range of 250 Hz to 4 kHz, the sensitivity of the Q70 measured 89.9 dB, essentially equal to KEF's 90-dB rating. The right and left units matched within a close  $\pm 0.5$  dB below 9 kHz. At higher frequencies, the match was much poorer.

Due to my past experience with coaxial-style midrange/tweeter drivers, which often exhibit high-frequency response aberrations on axis and near it, I took a set of 1-meter horizontal responses, 0° to 20° off axis, to investigate this effect. At 20° off axis (also shown in Fig. 1), the response is significantly smoother than the on-axis response is.

Figure 2 shows the complete set of horizontal off-axis responses without smoothing. Each curve has been displaced vertically by 20 dB, to clarify the individual responses. As can be seen, above 9 kHz the curves exhibit several deep high-Q peaks and dips that vary in frequency, depth, and width as the off-axis angle increases; beyond 15°, the high-frequency response settles down and is much smoother. This irregularity is the product of an acknowledged reflection cancellation within the Uni-Q driver, which KEF considers a worthwhile trade-off for the driver's dispersion and time coherence. With the speakers facing directly forward, as recommended in KEF's manual, listeners will hear the off-axis sound.

The phase and group-delay responses of the Q70, referenced to the tweeter's arrival time, are shown in Fig. 3. The phase curve exhibits the typical, ever-decreasing lag with frequency that most other non-time-coherent speakers exhibit. The phase decreases a significant

270° between 1 and 9 kHz. This rotation is primarily due to crossover design and somewhat due to physical offset between the tweeter and midrange. The group-delay curve indicates that the midrange lags the tweeter by about 0.15 to 0.35 mS. The dip at about 1 kHz corresponds to minimum-phase undulations in the phase curve due to an axial response that is not flat.

Even though the Q70 is billed as being space- and time-coherent, which greatly improves its coverage on a three-dimensional basis, note that it is still not a linear-phase speaker and not so time-coherent that it preserves waveshapes. But do keep in mind that however imperfect the response might be along one axis, the coaxial-style radiator also provides this same response along most other axes (the response above 10 kHz notwithstanding). What counts is that the response does not change with direction!

Figure 4 shows the Q70's energy/time response without the top grille. The test

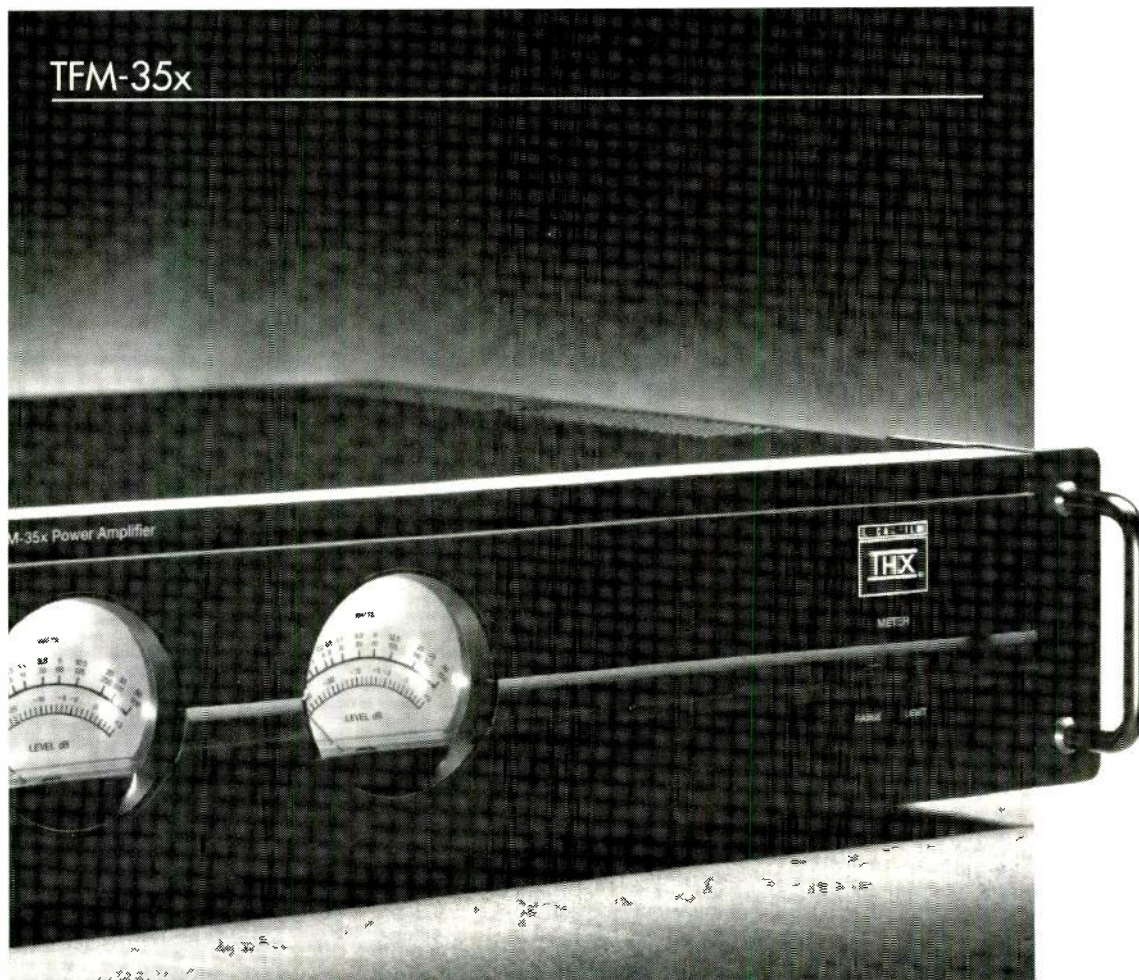
**KEF'S Q70 IS  
THE MODERATELY PRICED  
UNI-Q SYSTEM THAT  
A WORKING MAN  
MIGHT AFFORD.**

accentuates the response from 1 to 10 kHz, which includes the upper crossover region but does not include the coax's interference range above 10 kHz. The main arrival, at 3 mS, is quite compact but is followed by several narrow peaks some 18 to 22 dB down.

Figure 5 shows the horizontal off-axis responses; the bold curve at the rear is the on-axis response. Because the on-axis response ripples are carried over into the off-axis curves, the horizontal coverage is excellent and the off-axis response is quite uniform. Nonetheless, problems are evident above 10 kHz, in the 0° to 15° range, where the coverage is quite uneven.

The vertical off-axis curves are shown in Fig. 6. The bold curve in the center (front to rear) is on axis. Overall, the curves are very well behaved and do not exhibit any major off-axis peaks or nulls in the range of  $\pm 45^\circ$  off axis. Far off axis, moderate

TFM-35x



**The purity of separates. From the passion of Carver.**

The Carver name evokes an almost mystical following among serious music lovers.

And justly so. Carver power amplifiers have generated critical acclaim year after year, model after model, with one – the TFM-35 – universally acknowledged as “one of the best audio amplifier values in the world.” Upgraded to the TFM-35x, with high fidelity enhancements so advanced, it also exceeded the strict specifications of THX® home theater.

One look, one listen, will confirm Carver’s passion for aural perfection. Gold plated input jacks, 5-way binding posts, dual analog meters. Expansive headroom that faithfully –

no, stunningly – reproduces the dynamic peaks of digital music and movie soundtracks.

Witness the superiority of Carver separates: Flawless sound, low distortion, instant and authoritative response to octave fluctuations in the center channel. Note the abundance of power: At 360 watts per channel @ 4 ohms (triple that of a top receiver), merely one of the most powerful audio amplifiers available for *both* music and home theater.

With the infinite flexibility to accommodate system upgrades for years to come.

Yet, this is but a preview. For a feature length brochure, contact Carver today.

**CARVER**  
*Powerful • Musical • Accurate*

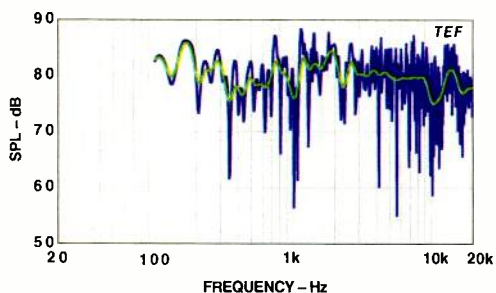
CARVER CORPORATION, P.O. BOX 1237 LYNNWOOD, WA 98036 • (206) 7751202

© 1994 Carver Corporation

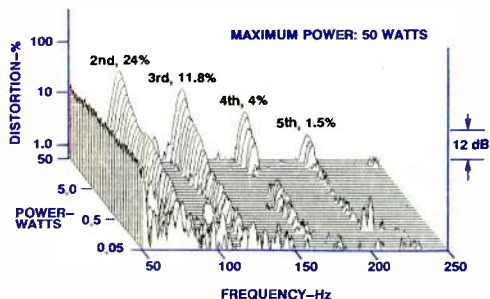
Distributed in Canada by Evolution Audio, Oakville, Ontario (416) 847-8888

THX is a registered trademark of Lucasfilm LTD. all rights reserved

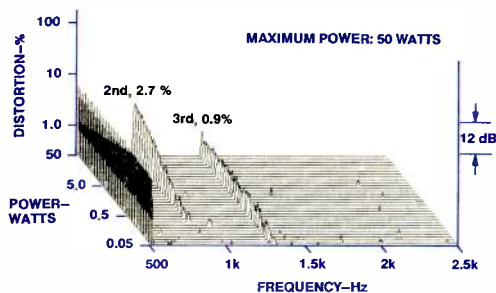
Enter No. 8 on Reader Service Card



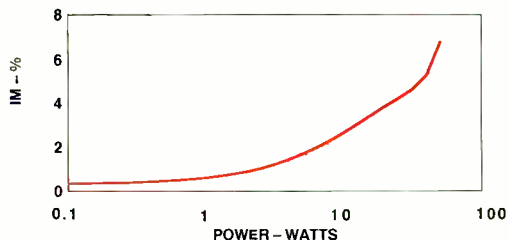
**Fig. 9—Three-meter room response.**



**Fig. 10—Harmonic distortion for E<sub>1</sub> (41.2 Hz).**



**Fig. 11—Harmonic distortion for A<sub>4</sub> (440 Hz).**



**Fig. 12—IM distortion.**

interference is evident above 2 kHz, where the response exhibits a series of closely spaced peaks and dips. Problems above 10 kHz are still evident in the  $\pm 15^\circ$  range.

In general, the Q70's horizontal and vertical off-axis responses are very consistent and quite well behaved. These are very desirable characteristics for any speaker.

Figure 7 shows the Q70's impedance from 5 Hz to 20 kHz. Most significant are the low impedance values, only a little more than 3 ohms, from 150 to 500 Hz and above 10 kHz. Although its impedance is quite low, a single Q70 will not be a problem for any competent amplifier. A local impedance minimum at about 45 Hz indicates a vented-box tuning. The maximum impedance of 12 ohms occurs near the upper crossover point.

The impedance has a max/min variation of about 3.6 to 1 (12.0 divided by 3.3). Cable series resistance should be limited to a maximum of about 0.05 ohm to keep cable-drop effects from causing response peaks and dips greater than 0.1 dB. For a typical run of about 10 feet, I suggest using cable of 14 gauge or larger.

Figure 8 indicates the complex impedance of the Q70, from 5 Hz to 30 kHz. Most activity takes place in the bass range and around the upper crossover, where large loops are evident. The complex impedance is otherwise unnotable. The impedance phase (not shown) reached a maximum angle of  $+36^\circ$  (inductive) at 1.7 kHz and a minimum angle of  $-41^\circ$  (capacitive) at 90 Hz.

A high-level sine-wave sweep revealed a fairly rigid cabinet. The only noticeable wall activity was a vibration of the top, sides, and rear of the top half of the cabinet, from 260 to 280 Hz. The 6½-inch woofers have a respectable maximum travel capability of about 0.5 inch, peak to peak. Higher excursion only generated high third-harmonic distortion but with no bad

sounds. No dynamic offset was evident at any input level or frequency. Even at high levels below 500 Hz, the crossover did a good job of minimizing excursion of the Uni-Q midrange driver. This reduces any potential intermodulation distortion due to the moving cone around the tweeter, which acts effectively as a horn for the tweeter's radiation.

Minimum cone excursion occurred at about 45 Hz for the lower woofer and 55 Hz for the upper woofer, an approximate third-octave ratio. These excursion minimums indicate the respective vented-box tuning frequencies of the individual woofer enclosures. At subsonic frequencies of 20 Hz and below, the KEF could handle about 12 V rms before the third-harmonic distortion was objectionable. The vent generated moderate wind noise above 10 V rms at frequencies from 40 to 60 Hz.

**THE SMOOTH,  
WIDE-RANGE SOUND  
DID NOT CHANGE  
SIGNIFICANTLY  
WITH LOCATION.**

The 3-meter room response of the Q70, with both raw and sixth-octave smoothed data, is shown in Fig. 9. The speaker was in the right-hand stereo position, aimed at the listening position; the test microphone was at ear height (36 inches), at the listener's position on the sofa. The system was driven with a swept sine-wave signal of 2.83 V rms (corresponding to 1.33 watts into the rated 6-ohm load). The direct sound and 13 mS of the room's reverberation are included.

Overall, the averaged room curve in Fig. 9 fits within a fairly tight, 11-dB window. Notably absent are any major dips from 200 to 700 Hz, the floor-bounce region. Above 9 kHz, the averaged curve essentially follows the axial response, complete with its peaks and dips.

To check for possible improvement in high-frequency smoothness by deliberately listening off axis, I ran two additional room responses. In one test, I aimed the Q70s straight ahead. In the other, I cross-fired the speakers, with their axes crossing

CT-27v



**Carver separates. The essence of total control.**

Enticed by the sweetness of separates for your home theater system?

But a nightmare image of a bazillion boxes and unruly wires has given you the heebie jeebies?

Re-l-a-x.

Now you can obtain a powerful home theater command center, combining the musical brilliance of separates with the ease of a receiver, all in one versatile package: Carver's CT-27v Dolby Pro Logic™ A/V Preamp/Tuner.

The CT-27v pairs flawless sound with exceptional Dolby processing, including a generous selection of DSP effects (wait 'til you experience an old movie like *Casablanca* on our "Matrix"

mode), yet without the extraneous gimmicks that undermine aural integrity.

When matched with a Carver amplifier (models from basic stereo to multi-channel), the CT-27v lets you direct power to any array of speaker combinations – a task for which a mere receiver is woefully undermanned. So you'll achieve wider frequency response and have the dynamic headroom necessary for those explosive moments in great movie soundtracks.

In sum: the CT-27v is the heart (and soul) of the most uncompromising home theater system. For more of the story, contact Carver today for a feature length brochure.

**CARVER**  
Powerful • Musical • Accurate

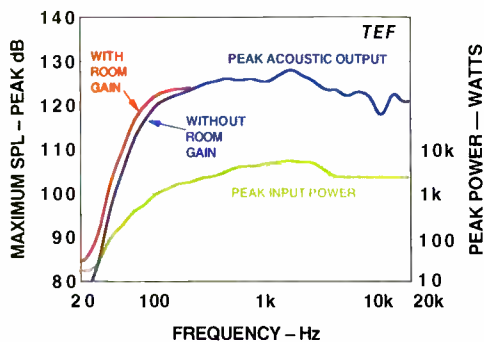
CARVER CORPORATION, P.O. BOX 1237 LYNNWOOD, WA 98046 • (206) 775-1202

© 1994 Carver Corporation

Distributed in Canada by Evolution Audio, Oakville, Ontario (416) 847-8888

Dolby Pro Logic™ is a registered trademark of Dolby Labs Licensing Corp.

Enter No. 9 on Reader Service Card



**Fig. 13—Maximum peak input power and sound output.**

at a point about 4½ feet in front of them; they were 8 feet apart. Both curves did show improvement in the smoothness of the high-frequency response while exhibiting hardly any change in the rest of the spectrum. The stability and evenness of the Q70's directional characteristics allow alternate aimings such as this to be performed successfully.

Figure 10 shows the  $E_1$  (41.2-Hz) bass harmonic distortion, with input power ranging from 0.05 to 50 watts (17.3 V rms into the rated 6-ohm load). The second harmonic reaches a high 24%, while the third is about half as low (11.8%). Higher harmonics include a 4% fourth and 1.5% fifth at full power. With a 50-watt input, the KEF reaches a usable 97 dB SPL at 1 meter, at 41.2 Hz.

The  $A_2$  (110-Hz) harmonic distortion is not shown because it reached only low levels of 0.76% second and 1.6% third at full power. Higher harmonics were below the noise floor of my analyzer.

In Fig. 11, the  $A_4$  (440-Hz) harmonic distortion, the predominant harmonic is a low 2.7% second and an even lower 0.9% third. Higher harmonics are negligible. With an input of 50 watts, the Q70 reaches a healthy 1-meter level of 108 dB SPL at 440 Hz.

Figure 12 displays the IM distortion created by tones of 440 Hz ( $A_4$ ) and 41.2 Hz ( $E_1$ ) of equal power, covering the range from 0.1 to 50 watts. The distortion rises only to the moderate level of 6.8% at 50 watts. Although this KEF is a three-way, its IM distortion is not as low as that of some competing three-way systems whose IM rises only to the 1% range. This is due to the Q70's fairly high, 400-Hz woofer-to-

midrange crossover frequency, which means that the woofer is still reproducing a significant amount of the higher frequency (440-Hz) test tone. With the crossover this high, the two IM test tones are not completely split between the woofer and midrange.

The Q70's short-term peak power input and output capabilities are shown in Fig. 13. The peak input power was calculated by assuming that the measured peak voltage was applied across the speaker's rated 6-ohm impedance.

The maximum peak input power starts at 17 watts at 20 Hz, begins to rise quickly at 32 Hz, passes through 1,000 watts at 100 Hz and 2,800 watts at 400 Hz, reaches a maximum of 5,700 watts at 1.6 kHz, and settles down to 2,400 watts above 3.2 kHz. Between 160 and 500 Hz, power handling was limited not by the Q70, but by my power amplifier running out of gas!

The first system I tested developed a tweeter failure (an open voice-coil) after I

**THE Q70s WERE LOUD  
AND CLEAN ON ROCK YET  
REPRODUCED THE NUANCES  
AND SUBTLE SHADINGS OF  
A MOZART PIANO WORK.**

had reached 160 V, peak, at 4 kHz (4,267 peak watts into 6 ohms). I then tested the other system at a reduced level of 120 V, peak (2,400 peak watts), above 3 kHz, without experiencing any problems. KEF subsequently sent a new tweeter to replace the failed one. With the new tweeter installed, the response was essentially the same as before. Note that the levels reached in my test of peak power are *much* higher than would be encountered in normal program material with typical power amps.

With room gain, the maximum peak output SPL starts at a fairly strong 85 dB at 20 Hz and rises rapidly into the mid-120-dB range above 200 Hz. Above 4 kHz, the Q70 can generate healthy peak levels in the range of 119 to 123 dB. With an amplifier of sufficient peak-power capability, the Q70 will have no problems re-creating the

peak SPLs of live instruments in a typical listening room. In the bass range, 110 dB peak SPL is attained at 50 Hz and 120 dB is reached at 80 Hz. The lower the frequency at which a speaker can generate this level, the better. The Q70's bass capability in this regard is not quite up to the average capability of all the speakers I have tested. It is ahead of systems such as the Thiel CS5 (110 dB at 80 Hz) and behind the KEF 105/3 (which reached 110 dB at 43 Hz).

### Use and Listening Tests

After unpacking the Q70s and preparing for setup, I was pleasantly surprised at their good looks and the ease with which they could be moved around. Even though these speakers look fairly sturdy, they are lighter than they appear to be. You can easily move the Q70 by placing one hand on the top rear while your other hand supports the front by gripping the top port tube (with the top grille removed, of course).

When shipped, the plinth bases are unattached, but I was able to attach them quite easily. The base is a definite requirement, because the speaker is easy to push over when it's on a carpeted floor. I did most of my listening without the spikes attached to the base.

My review systems were supplied in the handsome "video gray" finish, which looked to me more like flat black. Construction and fit are very good. All drivers are covered with molded plastic bezels that add to the Q70's appearance when the grilles are removed. The three individual grilles are quite easy to remove and replace. As I stated at the beginning of this review, the Q70s are actually less expensive than their appearance and sonics suggest.

The four-page installation instructions for the Q70 are brief and to the point. Sections include unpacking and handling, attaching the plinth, speaker placement and room acoustics, speaker cables and connections, bi-wiring, phasing, and amplifier requirements.

My listening equipment included Onkyo and Rotel CD players, Krell's KRC preamp and KSA-250 power amp, Straight Wire Maestro cabling, and the B & W 801 Matrix Series 3 speakers as references. Listening was done primarily with the normal (not the bi-wired) connections.

*Continued on page 86*





L I G H T S T A R



## INTRODUCING BREAKTHROUGH AMPLIFIER TECHNOLOGY WHICH ACHIEVES VIRTUALLY NOTHING.

**T**he consummate audio amplifier provides pure gain. *Nothing* else. Nothing added to, nothing subtracted from, the delicate texture of music.

Now a new amplifier from Carver Research achieves "nothing" to a degree never before possible. It's called Lightstar, and when you audition it, you will not hear it. You will hear nothing but transparent, effortless reproduction of music precisely as presented by the source.

Most astonishingly, *it will not matter which loudspeakers you use.* Lightstar is virtually immune to stress induced colorations caused by reactive loudspeaker loads, thanks to three breakthroughs in amplifier design.

**1. High Voltage Power Supply Storage** with five to ten times the usable energy reserves of most comparable amplifiers. Lightstar delivers full rated power below 10Hz, with perfect doubling of power as impedance is halved for unprecedented low frequency control regardless of speaker impedance fluctuations.

**2. A Digital Transformer™** which optimizes voltages delivered to the output devices. Relieved of "fighting" its own power supply, Lightstar converts voltage to output current with maximum efficiency.

**3. High Current, Reactive Load-Independent Amplifier** with over 150 amperes of peak current capability. Revolutionary circuit topology allows reactive currents "kicked back" from loudspeakers to circulate freely without inducing stress, enabling Lightstar to track input signals undisturbed by the vagaries of loudspeaker behavior.

The combined result is effortless, uncolored music reproduction. The sound of nothing. Call (206)775-1202 to find out where you can audition Lightstar. If you'd like more technical details, ask for our free White Paper.

C A R V E R R E S E A R C H

P.O. BOX 1237, LYNNWOOD WA 98046  
(206) 775-1202, FAX (206) 778-9453

Enter No. 10 on Reader Service Card

# CONRAD-JOHNSON PREMIER TWELVE MONO AMP



I have reviewed a number of pieces of conrad-johnson equipment over the years and have always been favorably impressed by their music-transferring properties. It was with pleasant anticipation that I received a pair of Premier Twelve tube power amplifiers.

The mono Premier Twelve, like the smaller stereo Premier Eleven and the flagship mono Premier Eight, represents conrad-johnson's current thinking on how to make musically accurate-sounding tube power amplifiers. Using four GE 6550 tubes, each Premier Twelve amplifier produces some 140 watts of output power. The output transformers are said to use a new winding technology that allows greater high-frequency power bandwidth. Most unusual is the lack of electrolytic capacitors

in the high-voltage power supply; the Premier Twelves have proprietary polypropylene capacitors for this function. A lone 4,700- $\mu$ F electrolytic is used in the front-end tube d.c. supply—bypassed, of course, by 2  $\mu$ F of polypropylene capacitance.

Chassis construction is a bit unusual but very attractive overall. From the side, the main chassis looks like one cycle of a square wave. The ends of this aluminum piece form the rear panel and a front sub-panel. The transformers and polypropylene filter capacitors are mounted on the upper surface of this piece; the main p.c. board sits in the well between this platform and the front subpanel portion. Black panels bolt on to form the chassis sides. A pale gold-colored piece forms the front panel; another, with holes for the tubes and for

access to their bias adjusters, closes off the chassis over the main p.c. board. A nicely constructed vented cage can be mounted over this cover, to protect people and hot tubes from each other. All in all, a most robust and attractive packaging job.

The main signal p.c. board is populated with appropriate high-quality parts, including a large number of conrad-johnson's proprietary polystyrene capacitors and polypropylene caps from other manufacturers. Another, smaller, p.c. board, toward the rear of the unit, serves to mount the various rectifier diodes and internal fuses and to act as a tie point and interconnection for various power-supply circuits.

## Circuit Description

The signal circuitry of the Premier Twelve is essentially like that of past conrad-johnson tube power amplifiers. This well-proven topology consists of an input stage using a 5751 dual triode with both halves paralleled, acting as a common-cathode amplifier. Plate output of this input stage is direct-coupled to a long-tailed-pair, phase-inverter, second stage made up of two 6FQ7 tubes with both halves paralleled. The phase inverter's plate output is coupled through separate capacitors to each of the four output tubes' control

## SPECS

**Power Output:** 140 watts rms into 4 ohms, 30 Hz to 15 kHz, at no more than 1% THD or IM distortion.

**Sensitivity:** 950 mV for full output.

**Small-Signal Distortion:** Less than 0.1%, midband.

**Polarity:** Noninverting.

**Frequency Response:** 20 Hz to 20 kHz, +0, -0.5 dB.

**Hum and Noise:** 98 dB below full output.

**Input Impedance:** 100 kilohms.

**Dimensions:** 17½ in. W x 7¼ in. H x 15 in. D (44.5 cm x 18.4 cm x 38.1 cm).

**Weight:** 48 lbs. (21.8 kg).

**Price:** \$3,295 each.

**Company Address:** 2733 Merrilee Dr., Fairfax, Va. 22031.

**For literature, circle No. 92**

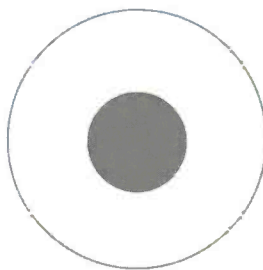
# Tom Miller's "Tweak of the Year"\* is now on CD.

\*(the abso!ute sound, vol. 17, #92)

## The Sheffield/XLO Test & Burn-in CD



THE AUDIOPHILE  
REFERENCE SERIES



**20+ → 16**  
**ULTRA MATRIX PROCESSING**

This project features Sheffield's **new 20 bit+ digital encoding process**, which allows for up to 15 db of low level signal that is below the 16 bit noise floor to be encoded on CD. This process only works on analog source material and presents a **standing breakthrough** in CD sound quality.

SHEFFIELD LAB RECORDINGS  
(805) 569-4744 Fax: (805) 969-5640

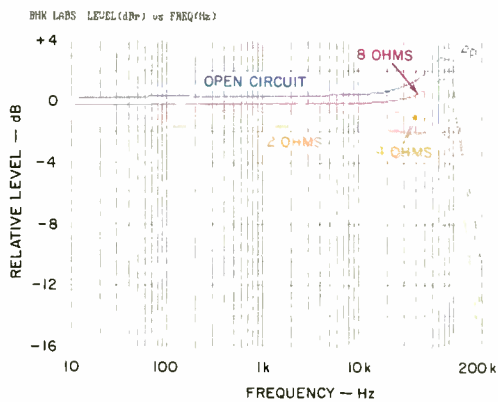
XLO ELECTRIC COMPANY, INC.  
(909) 466-0382 Fax: (909) 466-3662

Demagnetizes your system.

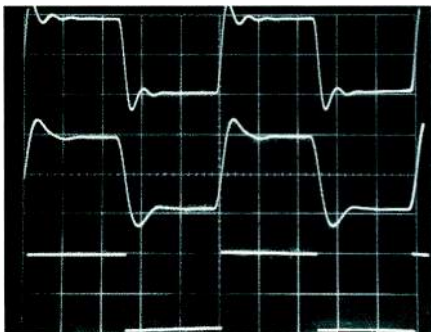
Burns-in cables, components and speakers.

The actual voices of Sheffield's Doug Sax and XLO's Roger Skoff give you the tools and instruction you need to really set-up and dial-in your system and listening room acoustics, including specific verifiable checks for realistic soundstaging, accurate imaging, and correct presentation of depth.

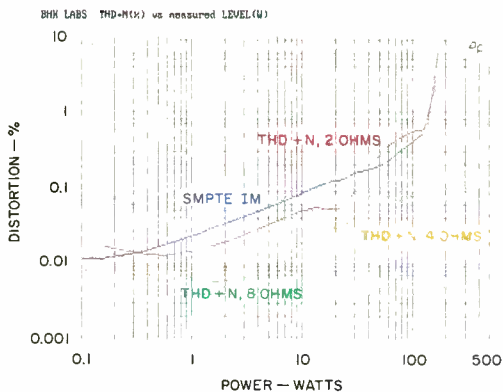
All this, PLUS five outstanding Sheffield Lab music tracks, and elaborate printed notes, for only \$29.95 at your XLO or Sheffield dealer. There's never been anything like it! Get yours NOW! It's an absolute ESSENTIAL for the best sound you can have at home!



**Fig. 1—Frequency response.**



**Fig. 2—Square-wave response (from top) at 10 kHz, 8 ohms (20  $\mu$ S/div.); 10 kHz, 8 ohms & 2  $\mu$ F (20  $\mu$ S/div.), and 40 Hz, 8 ohms (5 mS/div.).**



**Fig. 3—THD + N for 8-, 4-, and 2-ohm loads and SMPT-IM distortion for 4-ohm load.**

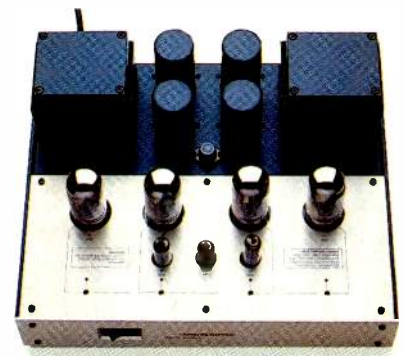
grids. The a.c. balance is accomplished by a rheostat in series with a fixed resistor (to limit the minimum resistance), paralleling one of the plate resistors in the phase inverter. The output stage is a push-pull parallel arrangement with an “ultra-linear”

connection to the output transformer’s primary winding. An overall negative feedback loop is taken from the secondary of the output transformer to the first stage’s cathode.

Separate voltage regulators for the first stage, phase inverter, and the bias supply for the output tubes are on the main p.c. board, next to the circuits they regulate. Each of these regulators uses the favorite conrad-johnson topology of a transistor current source feeding zener-diode voltage regulators that, in turn, feed Darlington-connected pass transistors. All bypass and filtering capacitors in these regulators are polystyrene or polypropylene.

For each output tube, there is an open-loop-connected op-amp that compares the tube’s cathode current, sampled through a 20-ohm resistor, to a reference voltage. An LED, connected between the op-amp’s output and ground, stays lit until the voltage drop across the cathode resistor equals the reference voltage, which signifies that the cathode current is now correct. Individual control-grid bias pots are adjusted until the indicator LED is just extinguished. Simple—and effective.

The main high-voltage supply consists of a full-wave bridge rectifier made up of discrete diodes, feeding a capacitor-input filter using one of the four 47- $\mu$ F main filter polypropylene capacitors bypassed by a 0.15- $\mu$ F polystyrene. A filter choke follows and is terminated in two more of the 47- $\mu$ F units in parallel, bypassed by a 0.15- $\mu$ F polystyrene capacitor. This point is the high-voltage supply for the output stage and feeds the center tap of the output transformer and the input to the front-end voltage regulators. The filter choke is paralleled by a 4- $\mu$ F polypropylene and a 0.15- $\mu$ F polystyrene capacitor in parallel; possibly, this is done to resonate the choke in order to reduce the final ripple to lower values.



### Measurements

When first powering up one of the Premier Twelves on the bench, a.c. line draw was about 600 mA before plate current started to come up. With the output stage’s plate current up and stabilized, the a.c. line draw became a healthy 2 amperes.

The two amplifiers I tested had 28.9 and 28.8 dB of gain. Their sensitivity figures were 101 and 102 mV. These measurements are referenced to 8 ohms, as is my usual practice; however, as we shall see, the

**THE BIAS-SETTING SYSTEM, ADJUSTING A POT UNTIL AN LED JUST GOES OUT, IS SIMPLE BUT EFFECTIVE.**

Premier Twelve is optimized for 2- to 4-ohm loads. Subsequent measurements, unless otherwise noted, will be presented for the amplifier that had the slightly greater distortion.

Frequency response at an output of 2.83 V, corresponding to 1 watt into 8 ohms, is shown in Fig. 1 for open-circuit, 8-, 4-, and 2-ohm loading. As can be seen, the Premier Twelve is a bit underdamped for loads greater than 2 ohms. Many cone speaker systems’ high-frequency impedance characteristics approximate those of an open circuit, due to the inductance of the tweeter’s voice-coil, and thus will have an ultrasonic peak of some 3 dB when used with this amp. This is a bit much for my own instincts as a circuit designer, but I presume that conrad-johnson compensated the amplifiers this way for sonic reasons.

Square-wave performance of the Premier Twelve is depicted in Fig. 2. Careful

Denon's lifelong philosophy of "Design Integrity" has led us to constantly improve audio quality in all phases of the reproduction chain—including circuitry for Home Theater. As a result, off-the-shelf IC components like those used by our competitors, are no longer good enough for Denon's AVR-2500 Audio/Video Receiver. The new Denon AVR-2500 features Dynamic Discrete Surround Circuitry, **D·D·S·C** which employs discrete surround circuitry plus an 18-bit digital converter in the DSP stage. (Most competitors use lower bit converters.)

## DON'T COMPROMISE SOUND FOR SURROUND.



Just as discrete components allow an audio system to be optimized for better sound, Denon's DDSC produces more accurate, more realistic surround sound by reducing Total Harmonic Distortion, by increasing Signal-to-Noise and minimizing DSP quantization noise.

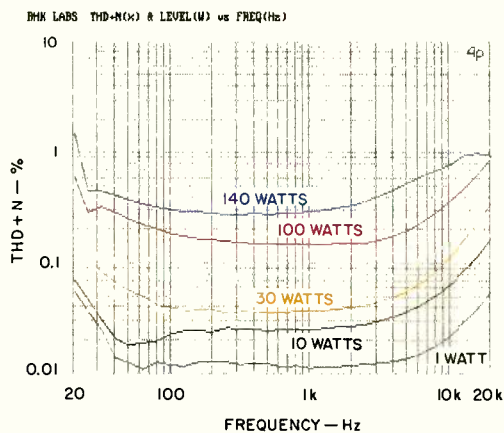
Naturally, the Denon AVR-2500 also features the latest audio and FM circuitry, such as multi-zone capability for playing different programs in different parts of your home and personal memory fields for one-button recall of your favorite, custom tailored surround sound stages. The AVR-2500 and AVR-1500 also feature the RDS *Smart Radio System*, which lets broadcasters offer you additional, invaluable information, services and conveniences, either on the front panel or via On-Screen Display on the AVR-2500.



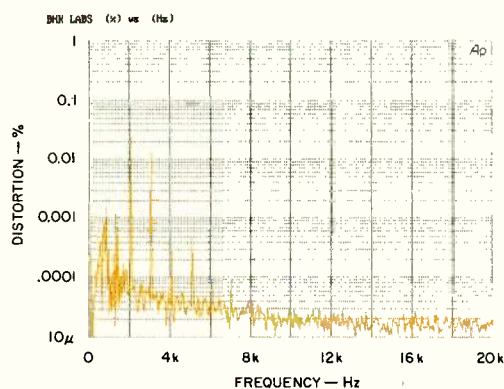
AVR-1500

Denon AV Receivers: DSP surround sound, advanced features *and* uncompromised High Fidelity.

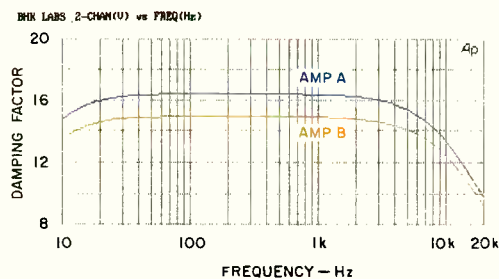




**Fig. 4—THD + N vs. frequency, 4-ohm loading.**



**Fig. 5—Spectrum of harmonic distortion for 1-kHz signal at 10 watts into 4 ohms.**



**Fig. 6—Damping factor vs. frequency, 8 ohms.**

**Table I—Output noise levels. The IHF S/N was 94.5 dB for one of the amps and 93.0 dB for the other.**

Bandwidth	Output Noise, $\mu$ V	
	AMP A	AMP B
Wideband	163	169
22 Hz to 22 kHz	141	148
400 Hz to 22 kHz	58	69
A-Weighted	53	63

examination of the top and middle traces reveals slightly different behavior for each half cycle. This may be due to different leakage inductance and shunt capacitance in the coupling from each half of the output transformer primary to the secondary. At lower levels (not shown), where both output tubes are always conducting, this phenomenon disappears. At the level shown in Fig. 2,  $\pm 5$  V, rise- and fall-times were about  $3.2 \mu$ s for 8-ohm loads and about  $3.6 \mu$ s for 4-ohm loads.

Total harmonic distortion as a function of power is presented in Fig. 3 for loads of 8, 4, and 2 ohms, together with SMPTE-IM distortion for 4-ohm loading. It is apparent that this amplifier is optimized for loads of 2 to 4 ohms. Figure 4 shows THD + N as a function of frequency for 4-ohm loading at several power levels. Figure 5 is a spectrum of the harmonic-distortion residue at an output of 10 watts into 4 ohms. Dominant distortion components are second- and third-order, with higher order components rapidly disappearing into the noise level. Distortion characteristics for the Premier Twelve are typical of the better tube amplifiers that I have measured.

Output noise for the Premier Twelve samples that I tested is listed in Table I. These noise values are extremely good, among the lowest I have obtained for power amplifiers.

Figure 6 shows damping factor as a function of frequency for both units, referenced to 8 ohms—as has been my practice. With the 4-ohm loads these amps are optimized for, damping factor would be half of that shown.

Dynamic power was measured for 8-, 4-, and 2-ohm loading, using the IHF tone-burst method. With 8-ohm loading, the amplitude attainable during the 20-mS burst didn't decrease noticeably with time, since there was little

power-supply droop caused by filter-capacitor discharge at this impedance. Equivalent sine-wave power was 100 watts. With 4-ohm loading, the attainable power at the beginning of the burst was 171 watts, decreasing to 149 watts at the end of the burst. At 171 watts, 4-ohm dynamic headroom was 0.9 dB. Finally, with 2-ohm loading, the beginning and end power levels of the burst were 182 and 150 watts, yielding a dynamic headroom of 1.14 dB (using the 4-ohm power rating of 140 watts and the power at the beginning of the tone burst). Steady-state clipping power was 100 watts at 8 ohms, with a 2.7-ampere line-current draw; the results for 4 ohms were 148 watts at 3.5 amperes and for 2 ohms were 143 watts at 4.3 amperes.

### Use and Listening Tests

The phono source equipment in my system during the review period included an Oracle turntable fitted with a Well Tempered Arm and Spectral Audio MCR-1 Select moving-coil pickup used with a Vendetta Research SCP-2C phono preamp.

**OUTPUT NOISE  
IS EXTREMELY GOOD,  
AMONG THE LOWEST  
I HAVE SEEN  
IN POWER AMPS.**

Digital sources were Krell MD-10 and PS Audio Lambda CD transports feeding a Sonic Frontiers SFD-2, a Stax DAC-Talent BD, and other (experimental) D/A converters. Other signal sources included Nakamichi's ST-7 FM tuner and 250 cassette recorder and a Technics open-reel recorder. Preamplifiers included a unit from Quicksilver Audio, a Forssell tube line driver, and a First Sound Reference II. Power amplifiers used for comparison were a Crown Macro Reference, a pair of Quicksilver M-135s, and an Arnoux MB300-A digital switching design. Loudspeakers used were B & W 801 Matrix Series 3s, augmented by an experimental subwoofer that has two JBL 1400Nd drivers.

Boy, the Premier Twelves sure aren't your smooth, syrupy, and forgiving tube

# Introducing THIEL speakers tailored for Home Theater



## No alterations required

*Main speaker pair—the THIEL model CS3.6. Rear and center channel speakers—the THIEL model SCS.*

## The best speakers for music are also the best speakers for video sound

**T**HE EXCITEMENT OF MOVIES IS MORE THAN VISUAL. It lies in the emotion of involving musical soundtracks and in the sonic impact of spectacular special effects that transport you from your living room and immerse you in the action.

THIEL speakers are an excellent choice for delivering all there is to hear and feel in home theater. Because they are designed to accurately and completely reproduce the incoming signal, THIEL speakers deliver all the realism, dynamics, and spatial dimensions of a movie soundtrack in the same way they accurately and naturally reproduce music-only recordings.

THIEL's *Coherent Source*® designs preserve the time and phase information in the movie soundtrack, so

spatial information is accurately reproduced. Sounds come from specific points and move realistically around a three-dimensional soundstage. THIEL's exceptionally uniform tonal balance allows voices to sound natural and authentic, not nasal or constricted. Subtle details of a rainshower or a shoe striking the pavement are easily heard because of THIEL speakers' unusually high degree of clarity. From the impact of explosions to the quiet rustling of a leaf, THIEL speakers' wide dynamic range fills the senses with extraordinary realism.

THIEL offers seven sonically matched speaker models priced from \$1,350 to \$12,300 per pair—all suitable for home theater applications. Visit your nearest THIEL dealer for just the right fit.

Call or write for literature, review reprints, and the name of your nearest THIEL dealer.

THIEL • 1026 Nandino Boulevard, Lexington, Kentucky 40511 • Telephone: 606-254-9427 • Fax: 606-254-0075

amps of old! They put forth a tremendous soundstage, with a great sense of space around instruments, when the recording had those attributes. A room-mode peak between 80 and 120 Hz, caused by the transfer function between my speaker and listening positions, seemed to thicken the tone a bit more with this amp than with



**BASS DEFINITION,  
WEIGHT, AND IMPACT  
ARE GOOD, AND  
THE SENSE OF REALISM  
IS VERY COMPELLING.**

other amps I use, such as the Quicksilver M-135s. Otherwise, bass definition, weight, and impact were very good.

These amps decidedly are high-definition! As is frequently the case when a component exhibits very high definition and resolution, the Premier Twelves had a tendency to be a bit edgy and irritating on some difficult source material. Overall, though, there was a sense of realism with these amps that was very compelling. I enjoyed their musically revealing qualities very much.

The amps operated reliably and had no real problems. I did, however, find it rather frustrating to keep the biases of the output tubes at the point where the LEDs just went out. As soon as the line voltage went up a bit, all the LEDs came on again. I finally just left the bias pots alone. Also, when I turned the amps off, they put out a thump that displaced the 801s' woofers about a half inch.

The Premier Twelves are the most high-definition and musically revealing tube amps that I have heard from conrad-johnson thus far. I strongly recommend a listen to them.

*Bascom H. King*

**KEF**, *continued from page 78*

KEF recommends not placing the Q70 in a corner or near a side wall because the added bass boost will muddy the sound, and the nearness of the side wall will cause the stereo image to deteriorate. I placed the speakers in my customary locations, about 8 feet apart and well away from the side and rear walls. Listening was done from my couch, 10 feet away.

KEF also recommends that the Q70s be faced straight ahead, not toed in, to produce the best balance between direct and reflected sounds. I experimented with several aimings—including straight ahead, toed in, and cross-fired—but had no clear preference. The wide, very even coverage of the Q70s, on a three-dimensional basis, makes them somewhat less sensitive to room placement and aiming than other systems are. The majority of my listening was done with the Q70s toed in slightly.

Even though I listened critically to determine if there were any detrimental effects in high-frequency response when the systems were listened to on axis, rather than off axis, I was not able to draw a clear conclusion. With program material, I could hear no consistent difference, although with pink noise some slight comb-filtering roughness was evident in very high frequencies when I moved back and forth in front of the speakers.

The Q70s were somewhat more sensitive than my reference B & Ws. A reduction of 4 dB for the Q70s was required on my level-matching box to equal the level of the B & Ws. Initial listening to the Q70s evidenced a smooth, wide-range sound that changed very little with listening location or height. The main difference, compared to my reference speakers, was a reduction in bass level, particularly on rock kick drum and organ pedal notes.

The KEFs did particularly well on male and female speaking voices. I played a very good demo disc, the *Sheffield Drive* sampler (Sheffield Lab 10037-2), and heard a very dynamic sound and quite satisfying bass. The KEFs' overall sound was quite similar to the B & Ws' but had a slightly emphasized high end and less bass.

The Q70s could be played satisfyingly loud and clean on rock material, such as The Rolling Stones' *Voodoo Lounge* (Virgin Records 39782-2). On Jagger's solo voice,

the KEFs exhibited some high-frequency sibilant roughness and emphasis as compared to the B & Ws. On the slower tracks where Jagger sings solo, the Q70s produced a very credible center image, with good stability and quite satisfying realism. (Although some reviewers have panned this album, I love it. Just one old guy listening to some other old guys play good old rock 'n' roll!).

**THE KEF Q70s OFFER  
SOUND, PERFORMANCE,  
AND GOOD LOOKS  
BEFITTING MUCH MORE  
EXPENSIVE SPEAKERS.**

On more sedate material, such as Mozart's Piano Concerto No. 19 (Perpetua PR 7013), the Q70s demonstrated an excellent soundstage while nicely reproducing the subtle shadings and nuances of the piano work.

On the pink noise stand-up/sit-down test, the Q70s exhibited no change at all when I stood up; the coverage was smooth and even at all of my positions! On this test, the Q70s were actually slightly better than the 801s, no mean feat! The KEFs' spectral balance on pink noise was quite accurate and extended but not quite as smooth as the B & Ws', and they had significantly less low bass. On third-octave band-limited pink noise, the KEFs did quite well at 40 Hz and above but generated only weak output at 31.5 Hz and no usable output at lower frequencies.

The Q70s' dynamic range capability was well demonstrated on big-band material, such as *For Duke* (RealTime RT1001). Here the solo trumpet work on track 1 was uncannily realistic, with the characteristically loud up-front horn sound reproduced quite faithfully and cleanly. Played at high levels, the big-band sound was reproduced with minimal compression and very little harshness.

In all my tests, the KEF Q70s performed flawlessly and demonstrated sonics, performance, and good looks befitting much more expensive speakers. They would make an excellent addition to any stereo or home theater system.

*D. B. Keele, Jr.*



**TROUBLE GETTING YOUR  
KIDS TO LEAVE THE NEST?  
INTRODUCING PIONEER'S  
LASER KARAOKE PLAYERS.**

**YOU'VE LOST  
THAT LOVIN' FEELIN'**



*Few things get a bigger rise out of kids than a song that's off the charts. Particularly if you're the one singing it. With a Pioneer® Laser Karaoke Player, though, everyone can unleash their vocal talents. It gives you CD-quality backup music to over 1500 tunes while showing the lyrics and a video on your TV. What's more, should the crooning reach critical mass, it also lets you listen to CDs or watch laserdisc movies. So check one of these players out. Then cue up an old favorite. And deliver a rendition your kids are sure to find really stirring.*

**PIONEER®**  
The Art of Entertainment

For the nearest dealer, call 1-800-Pioneer, ext. 711. ©1994 Pioneer Electronics (USA) Inc., Long Beach, CA.  
Enter No. 36 on Reader Service Card

# ELECTRO-VOICE N/D 857B MICROPHONE

**T**he N/D 857B is part of Electro-Voice's recently developed N/DYM series of dynamic microphones that employ neodymium, a rare-earth magnet material, for increased electroacoustical sensitivity. Electro-Voice states that the 857B has the highest sensitivity in the N/DYM line and that it is "the best mike for live concert vocal applications, with the lowest han-

dling noise [and] a more effective P-pop filter."

Electrodynamic transducers, such as those in ribbon and dynamic microphones, are usually limited in dynamic range by the noise of the preamplifier to which they are connected. For instance, a typical dynamic microphone has a sensitivity of -57 dB (referred to 1 V per pascal). If it is used with a hypothetical high-quality preamp whose equivalent input noise level is -130 dB, then the noise floor of the mike would be 21 dB SPL (equivalent sound pressure level at the input of the mike, with 0 dB defined as 20  $\mu$ Pa.). Such a mike would not be able to take advantage of the full dynamic range available in a quiet studio where the acoustic noise is less than 21 dB.

The 857B has a rated sensitivity of -49 dB; if we used this mike with our hypothetical preamp, then the noise floor would be 13 dB, an 8-dB improvement thanks to neodymium. The rated output noise of the 857B is, almost coincidentally, 14 dB, which is probably the thermal noise of the resistive part of the microphone impedance. This means that, with neodymium, the equivalent SPL of the microphone

noise is now virtually equal to the equivalent SPL of the preamp noise. Microphone performance is no longer limited by the

preamp.

(See the September 1978 issue for a discussion of microphone and preamp noise. The formula for thermal noise  $E_n$  on page 35 should not have a square root sign.)

The 857B's 14-dB noise floor (when used with a good preamp), combined with its rated dynamic range of 144 dB, gives a maximum input SPL of 158 dB. This performance equals or exceeds that of many condenser microphones.

Noise from other sources has also been addressed in this microphone's design. A hum-bucking coil in series with the voice-coil, a familiar EV feature, has been placed right in front of the voice-coil, for maximum cancellation. (However, EV does not provide a spec for hum sensitivity.) The voice-coil is at line impedance, so there is no impedance step-up transformer to pick up hum or limit performance in other ways.

Noise caused by handling is reduced by a cleverly designed pneumatic system. A rubber chamber below the transducer cartridge stores a volume of air that is either above or below atmospheric pressure when

you are moving the mike at a steady speed. When the mike is stopped by hitting an object, the diaphragm wants to keep on moving, which would cause an audible thump. But the stored air is then released to oppose the motion, and noise is reduced. This takes care of low-frequency noise, and a conventional rubber isolator around the transducer reduces high-frequency handling noise. Electro-Voice calls this the AcoustiDYM shock-mount system.

The remaining noise output of the microphone may be reduced, as desired, by selecting the low-cut position of the switch under the windscreen. Unlike the low-cut filters of many earlier mikes, this filter does not change vocal timbre and will not reduce the bass boost that occurs when a directional mike is close to the source. This is because the filter, an LC type, has a steep, 12-dB/octave slope and is tuned to 80 Hz, below the voice range. The AcoustiDYM system and this filter are said to prevent disturbing thumps when the mike is used

## SPECS

**Operating Principle:** Dynamic.  
**Polar Pattern:** Supercardioid.  
**Frequency Response:** Near, 25 Hz to 22 kHz; far, 50 Hz to 22 kHz.  
**Sensitivity, Open-Circuit Voltage:** 3.5 mV/pascal at 1 kHz (-49 dB re: 1 V/Pa).  
**Power Level:** -50 dB at 1 kHz (0 dB = 1 mW/Pa).  
**Dynamic Range:** 144 dB.  
**Equivalent Output Noise:** 14 dB re: 20  $\mu$ Pa.  
**Impedance at 1 kHz:** Rated, 150 ohms balanced; actual, 320 ohms.  
**Dimensions:** Length, 7.4 in.; grille diameter, 2.25 in.; handle diameter, 0.8 in. (18.8 cm, 5.7 cm, 2 cm).  
**Weight:** 7.9 oz. (224 grams).  
**Supplied Accessories:** Warm-Grip handle, No. 323S stand clamp, and vinyl carrying case.  
**Optional Accessories:** PLC-25X cable, PLC-25P cable, and No. 313 shock mount.  
**Price:** \$442.  
**Company Address:** 600 Cecil St., Buchanan, Mich. 49107.  
**For literature, circle No. 93**

# From the mind and soul of Bob Carver, a new company—and a new amplifier.



**Yes**, after 14 years, Bob Carver has left Carver Corporation, the company he founded and nurtured. Said Bob, "I wanted to start a smaller company, the kind I really like." That company is Sunfire Corporation.

Now, as you know, Bob Carver created the dominant amp of the '70s, the Phase Linear 400, as well as the dominant amp of the '80s, the Carver M-400 magnetic field amplifier, and also the "amp of the decade," the mighty Silver Seven vacuum-tube amplifier. You would think, therefore, that the amplifier that launches his new company must be quite special. Indeed, the new Sunfire amplifier may well define the art for the rest of this century.

## Performance that's difficult to believe.

The Sunfire can produce 600 watts rms per channel into 4 ohms and it can do so continuously.\* Into 2 ohms and 1 ohm, it can deliver, respectively, 1200 watts and 2400 watts rms on a time-limited basis, and its peak-to-peak current output capability is 138 amperes! This enormous current is supplied by 24 massive Motorola triple-diffused output devices, each capable of 20 amperes with current to spare. The intrinsic frequency response extends from dc to beyond 0.25 megahertz. Its distortion is orders of magnitude below audibility, with the profile of a classic vacuum tube amplifier.

## The breakthrough.

The big breakthrough feature of the Sunfire amplifier is its uncanny tracking downconverter, which uses 12

herculean International Rectifier Hexfets. This downconverter provides the seemingly magical gift that allows the amplifier to drive *any* load to *any* rationally usable current or voltage level.

## Here's the best part.

We've included two kinds of outputs: (1) a standard voltage-source (i.e., near zero impedance) output for all typical applications and (2) a higher-impedance current-source output, specially suited for electrostatic, planar magnetic, or ribbon speakers. Or, and this is the second best part, you can biwire your speaker with the voltage source driving the woofer(s) and the current source driving the upper part of the system. (In many cases this provides by far the best possible interface between the amplifier and the speaker system.) You can even select gold RCA standard inputs or gold XLR balanced inputs. Your options are practically unlimited.

Whichever way you decide to hook up the Sunfire power amp, it will create a multilayered soundstage that is deep, wide, three-dimensional, and utterly believable. And, thanks to the optional current-source output, its musical voice can be as soft, sumptuous, and delicately detailed as you wish. (The slight current-source characteristic of vacuum tubes is the dominant factor in the soundstage delivery of classic tube amplifiers.) And the bass "slam" or "whack" with all that available current is, well, not to be believed. But don't believe us, go to your nearest Sunfire dealer and see for yourself.

\* F.T.C.: 300 watts continuous per channel, both channels driven into 8 ohms from 20 Hz to 20 kHz with no more than 0.5% THD  
Price: \$2,175

**Sunfire** Corporation

For more information on the Sunfire, and especially the uncanny tracking downconverter, use the reader service card or write to Sunfire Corporation, PO Box 1589, Snohomish, WA 98290

with sound systems having extended bass response.

The LC filter has a 15- $\mu$ F capacitor in the switchable low-filter leg and a 3.3- $\mu$ F capacitor that is always in series with the transducer. I asked EV if electrolytic capacitors are used, and their reply was that the 857B has tantalum capacitors, which are more linear than electrolytics. The use of

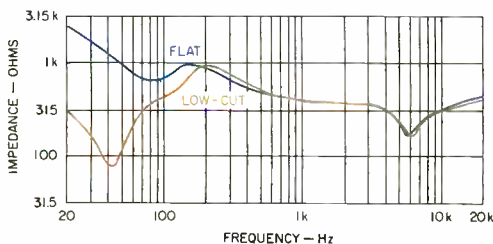


Fig. 1—Impedance.

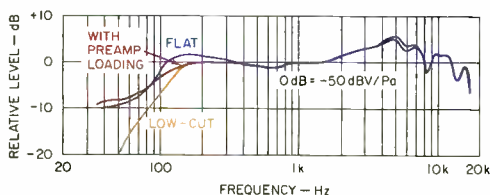


Fig. 2—On-axis frequency response, 12 inches from source; see text.

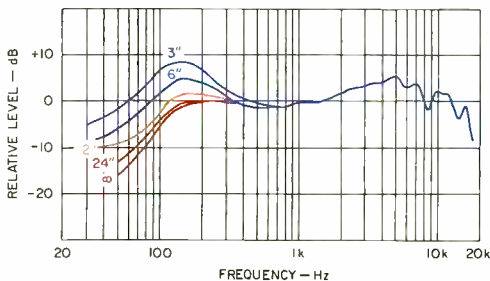


Fig. 3—Frequency response vs. distance.

tantalums in millivolt-level audio circuits without d.c. bias strikes me as a questionable practice at best, because of possible distortion. (Electro-Voice, however, says that these nonlinearities would be dwarfed by those normally found in dynamic microphones.) And while a plastic-film capacitor of the 15- $\mu$ F value used for the low-cut filter would be too large to fit in the microphone case, perhaps a plastic-film capacitor could have been fitted into the handle for the 3.3- $\mu$ F capacitance, which is always in the circuit.

Popping "Ps" in vocals are addressed by the use of a pop filter, a piece of foam be-

hind the microphone grille screen. The steel grille itself is said to be highly resistant to damage, and a rubber bumper around its periphery cushions the bumps. The aluminum handle has a removable sleeve with a rubbery surface that EV calls Warm-Grip. This sleeve and the mike's light weight give the 857B a good feel when it is held. The Warm-Grip sleeve must be removed if the 313 shock mount is used. The sleeve can be pulled off by using moderate force, but this is not obvious. The grille and the handle grip may be replaced, so a well-worn mike could be made to look like new.

Electro-Voice intends the 857B to compete with the Shure SM58, a vocal mike especially popular with touring rock performers. However, microphones such as these have many other applications in pro and amateur recording and sound reinforcement. Brass, strings, woodwinds, and choral groups may be recorded or amplified with this kind of mike.

I was impressed by the individually drawn frequency response chart included with the 857B. This chart is appropriately printed on the back of the warranty card.

#### Measurements

I tested impedance first, as magnets with high flux density (such as neodymium) will reflect more of the motional impedance of the diaphragm and coil, and I felt that the LC elements in the mike would cause some interesting variations of impedance with frequency. Figure 1 shows that the characteristics are fairly lumpy, as expected. With the mike's filter in its flat position, the impedance goes up beyond 2 kilohms at 20 Hz (due to the 3.3- $\mu$ F series capacitor) and down to 163 ohms at 5.6 kHz (due to a series RLC network shunting the output, which resonated at that frequency). In low-cut position, the impedance dips to 77 ohms at 39 Hz. The rated impedance is 150 ohms, and the stated "actual" impedance is 320 ohms. This puzzled me, as the measured impedance was mostly far higher than even 320 ohms. When I asked my technical contact at EV about it, I was surprised to receive a page

and a half of explanation, which I summarize as follows:

*The actual load impedances of preamps are 2 kilohms or higher, so loading by the mike's impedance will not cause significant frequency response variations. The impedance ratings are in accordance with industry practice: The d.c. resistances of the humbucking coil (20 ohms) and the voice-coil add up to the rated 320 ohms. Directional mikes have large impedance variations. The RLC series shunt network was needed to correct a response peak caused by the need to maintain a good polar pattern at high frequencies. If the mike is loaded by less than the optimum 2-kilohm value, the resulting response variations will be located below 200 Hz. In this region, the variations in bass*

**THE 857B HAS AN  
ESSENTIALLY PERFECT  
HYPERCARDIOID PATTERN  
OVER A WIDE RANGE  
OF FREQUENCIES.**

*response when working the mike closely will swamp out any small variations due to loading. The series capacitor causes high impedance at the lowest frequencies, where the mike is not intended to have any output.*

I accept this explanation, but I think that part of the 7-dB increased sensitivity is from winding more turns on the voice-coil, which increases its impedance above a nominal 150-ohm value. Many makers do this.

Figure 2 shows the actual variations in frequency response encountered with my lab preamp, which has a balanced, "unloaded" input using a transformer designed to work with 150-ohm sources. The response curve taken with preamp loading was corrected to open-circuit by taking an electrically calibrated response with a voltage in series with the microphone and then subtracting it from the preamp-loaded acoustical response. The result is the curve without loading, marked "Open-Circuit." My preamp's impedance is about 2 kilohms at 1 kHz, which decreases to about 1 kilohm at 50 Hz. The 1.5-dB hump between 100 and 200 Hz was flattened out by loading; this seemed desirable at the test distance, 12 inches from my 2-inch source.

## Satellite and Subwoofer Speakers: The "Overnight Success" of the '90s.

Overnight, it seems, virtually everyone has discovered the advantages of the satellite-subwoofer speaker concept—*especially* for use in the home theater.

1994 marks M&K Sound's *twentieth* year at the forefront of this technology. After two decades of developing and refining this concept, we are flattered to see satellite and subwoofer speaker systems become

the dominant choice for the multichannel home theater.

M&K speakers have been found in Hollywood screening rooms (the earliest home theaters) since the 1970s.

Long acknowledged as the deep-bass specialists, we've also been pioneers in direct-to-disc and digital audiophile recording with our RealTime Records label—the first U.S. label to release compact discs.



MX-100  
Powered Subwoofer

T W E N T I E T H

1 9 7 4 M & K 1 9 9 4

A N N I V E R S A R Y

S-1C Satellite  
Speaker



We celebrate our twentieth anniversary by introducing the new M&K S-1C.

This *first* Push-Pull Dual-Driver Satellite speaker exceeds the superb musicality of its legendary predecessors, thanks to M&K's unique Transmission-Line tweeter and several other significant improvements.

Combine the S-1C with an M&K MX-series Deep Bass Powered Subwoofer to cre-

ate a *high-performance*, flexible system that can be optimized for both two-channel music and multichannel film and music reproduction.

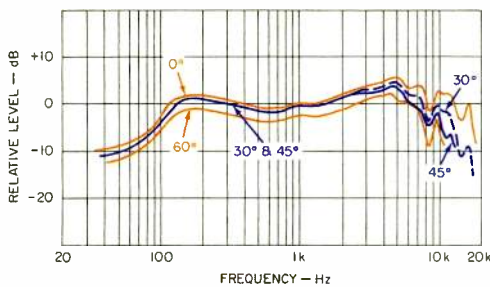
With six Satellite and thirteen Powered Subwoofer speaker models, M&K gives you the widest selection in the industry.

Choose M&K and discover what twenty years of cutting-edge expertise can bring to your listening experience.

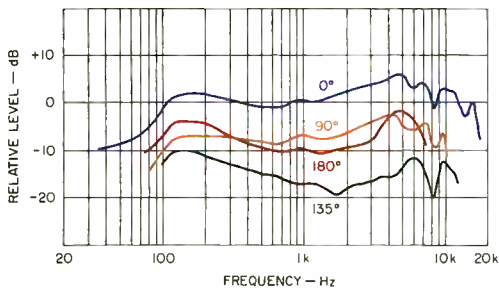
MILLER & KREISEL  
SOUND CORPORATION

10391 Jefferson Boulevard  
Culver City, California 90232  
310 204-2854, FAX: 202-8782

Enter No. 23 on Reader Service Card



A



B

**Fig. 4—Frequency response vs. angle for front (A) and for side and rear (B).**

Note also a slight (0.5-dB) rise at the frequency of the series RLC network (4 to 6 kHz). It would be wise to use a preamp without an input transformer, which would offer a resistive load of 2 kilohms or greater. All curves, unless noted, refer to the on-axis (0°) response.

Also shown in Fig. 2 is the effect of the low-cut filter on open-circuit response. The 3-dB down point of the filter was 90 Hz with preamp loading (not shown) and 130 Hz without it. The manufacturer's data sheet indicates that the filter's cutoff frequency is 80 Hz. The roll-off does not approach 12 dB per octave until below the stated cutoff frequency, so I cannot quibble much with the data sheet.

Next, the 857B's axial response was measured at various distances from the source, to show the proximity effect. (All of the following response curves were corrected to open-circuit.) My 2-inch-diameter source is similar in size to the human mouth, so the results (Fig. 3) should accurately show the bass boost for close-up use. The frequency responses at working distances from 3 to 24 inches were measured; the curve for infinity (or plane wave) is a theoretical projection. The response at 3 inches shows more than 8 dB of boost at 150 Hz compared to infinite distance. The

"close" curve in EV's data sheet shows 15 dB of boost at 200 Hz; the testing distance must have been much closer than 3 inches. Many users will not be this close, so the boost in average close-up use should not exceed 7 dB at 200 Hz.

Figure 4 shows the frequency response of the 857B versus angle. Figure 4A shows the frontal responses for 0° to 60° off axis. In this region, the responses at various angles should be the same so that the quality of the sound coming directly from the source does not change with the microphone's orientation. The 857B meets this objective quite well in the voice range up to 6 kHz. Note that the acceptance angle of the mike is at least  $\pm 60^\circ$  (120° total). In the voice range, the response does not change significantly relative to angle, and the output level does not vary more than 3 dB.

Figure 4B shows the responses from 90° to 180°. These curves should show maximum attenuation of the sound from the rear hemisphere, which is primarily room reverberation and noise. The 857B is stated to have a supercardioid (more generally called "hypercardioid") polar pattern, which has minimum response at 135° and 225° off axis and a slight lobe, or increase in response, at 180°. The 857B has 7 to 8 dB of rejection at 90° over a wide range of frequencies, compared to 6 dB for a cardioid. Rejection at 135° is 15 to 20 dB at frequencies above 400 Hz—a perfect null, for practical purposes. (Below 400 Hz, my lab has too little absorption to show very high rejection.) The 180° response is down about 10 dB over a wide range of frequencies, which is acceptable for a hypercardioid. To summarize, the 857B had an essentially perfect hypercardioid pattern over a wide range of frequencies.

Next, I compared the axial frequency response of the 857B to other available mikes that are good for voice pickup. The RCA 77-DX polydirectional ribbon mike, with cardioid and mild low-cut ("V1") settings, was the original standard for voice and dialog pickup in television. It is now favored for voice, brass, and choral use. The 77-DX had a little more bass than the EV but oth-

erwise similar response. The RCA BK-5B ribbon uniaxial, also set to "V1," had very similar response to the EV. The 857B's response was also practically identical to the responses of the Beyer M500 ribbon hypercardioid (reviewed in the February 1978 issue), the Shure SM58, and the Audix OM3xb. It is gratifying to see that the 857B's response is similar to that of so many established mikes.

A second 857B was provided for possible stereo use, and I measured its axial frequency response. The curve matched the first unit's within  $\pm 1$  dB up to 8 kHz and within  $\pm 2$  dB to 20 kHz. Sensitivity at 1 kHz matched exactly. (Of course, since I had requested a pair for stereo, EV could have selected a matched pair.)

My EMT polarity tester indicated that pin 2 of the EV was positive, as specified. Hum pickup was 20 dB less than my RCA Lab Standard 44-BX, which was calibrated at -128 dBm in a 1-milligauss field. This is

**AN EFFICIENT MIKE  
LIKE THE 857B  
BRINGS THE SAME  
EFFORTLESS CLARITY AN  
EFFICIENT SPEAKER DOES.**

incredibly low hum pickup, about -148 dBm. Hum should never be a problem with the 857B.

The 857B had 14 dB less handling noise than the Audix, 10 dB less than the SM58, and 6 dB less than the RCA 77-DX with its shock mount. This means that the EV's vibration-noise-reduction system is very effective and that handling noise is nil. P-pop noise of the EV was equal to that of the Audix and Beyer mikes but 8 dB less than that of the SM58.

#### Use and Listening Tests

I made several voice recordings with the Beyer, Audix, Shure, and RCA mikes and compared them to recordings made with the EV. The Beyer M500 had 10 dB less sensitivity than the EV, similar directivity, but picked up more lab background noise. The Beyer sounded thin; the EV had warmer sound on flat and low-cut. The Audix OM3xb had 6 dB less sensitivity,



# Recyclable.

Don't trash your old CD player. It's not biodegradable. Besides, it's worth \$100, maybe more.

Right now through December 15, 1994, your old CD player—regardless of brand, model, or condition—is worth \$100 in trade toward the purchase of any new MusicBank™ CD changer at the suggested retail price.

Your old CD player may be broken. Or just tired. Perhaps

*you're* just tired of its lackluster sonic performance or its slow, outdated carousel- or magazine-type mechanism.

Whatever your reason, it's an unprecedented opportunity to trade up to state-of-the-art Nakamichi MusicBank technology. So, be environmentally correct. Dust off that old CD player, and take it to your authorized Nakamichi dealer today.



Nakamichi America Corporation, 955 Francisco Street, Torrance, California 90502, (310) 538-8150

MusicBank is a trademark of Nakamichi Corporation.

Enter No. 29 on Reader Service Card

some equations are simple.  KIMBERKABLE

2752 south 1900 west • ogden UT • 84401 • 801.621.5530



The above logos and combinations are trademarks of KRB Industrial © KRB Industrial 1994

poorer directional characteristics, and much more background-noise pickup than the EV. The Audix sounded more “raspy” than the EV, which sounded natural, smooth, and clean. The Shure SM58 sounded similar to the EV but picked up more background noise. Of the two RCA mikes, the BK-5 (set at “V1”) had 6 dB less sensitivity, picked up less background noise, and sounded nearly the same as the 857B. The 77-DX (set at cardioid and “V1”) had 4 dB less sensitivity and picked up more background noise; it sounded similar to the EV but with more bass. These test results did not agree exactly with the conclusions drawn from the frequency response measurements. The latter were, however, valuable for sorting out which mikes to listen to and what to listen for.

I had the opportunity to use the EV mikes at several church functions, together with the Beyer, Shure, and Audix mikes, for speech and singing at pickup distances of 12 inches or less. Each time I was impressed with the clarity, natural sound, and high intelligibility of the 857Bs. They did not suffer from any handling or stand noise or from breath pops. The input gain controls on my mixing board had to be set at -10 dB, compared to 0 for the Beyer ribbon mikes. These settings greatly reduced the hum and noise from the lengthy house cables, which was appreciable with the low-output ribbon mikes. The EV is easily the best mike I’ve tried in vocal applications. (My classic RCA mikes are semiretired, so my conclusion does not include them.)

The last listening tests involved recording two local musical groups in rehearsal. Neither of these tests included comparisons to other microphones, as they were hastily arranged sessions done by friends. Roger Blackburn, who plays trumpet with the Philadelphia Orchestra, made an analog cassette of a barbershop quartet that he sings with. He and I usually record his quartet using two Beyer M500 ribbons in a nearly coincident X-Y stereo array. We have tried dynamics, ribbons, and condensers, looking for the sound Blackburn wants. The EV mikes, positioned the same as the other mikes, had a very clear vocal sound; each voice was separated in space and timbre yet was well blended.

Carlton Read, who has made many test recordings of mikes for my reviews,

recorded a trio of piano, violin, and cello. The mikes were connected directly to the balanced inputs of a portable TEAC DAT recorder. I thought the sound was outstanding. The rising high-frequency response of the EV gave brilliance, enhancing the group’s funky, 1930s sound. To my surprise, the rolled-off bass response of the EVs seemed to have little effect; there was adequate bass to suit the instruments and music. The treble end sounded clean and extended.

The EV N/D 857B was the best vocal mike of the contemporary mikes mentioned here. Its sound on voice and selected musical instruments was excellent. The advantage of its high sensitivity in overcoming preamp noise was easily calculated,

**THE EV IS EASILY  
THE BEST CURRENT MIKE  
THAT I HAVE TRIED  
IN VOCAL APPLICATIONS.**

and I discovered that it also overcame the hum of house cables. An efficient microphone seems to add clarity to sonic performance, much the same as an efficient speaker seems to reproduce sound effortlessly. The EV, in addition to having high audio output, had very low noise from hum, handling, and breath pops.

I would recommend the 857B for all vocal and choral applications, especially where it might be handheld and roughly handled. It is also recommended for pick-up of all instruments except those with low bass. Because of its low-frequency limitations, it is obviously not suited to recording a symphony orchestra, though it could be used as an accent mike in orchestral recording.

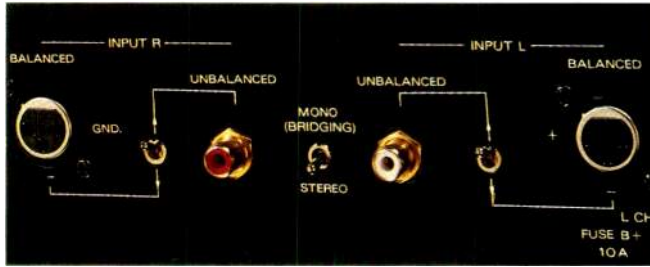
*Jon R. Sank*

#### Acknowledgments

In addition to thanking my friends mentioned above for making test recordings, I would like to thank Jim Long and Mike Bryson of Electro-Voice for taking time to prepare detailed written material and sketches in answer to my questions about the design and testing of the N/D 857B microphone.

*J.R.S.*





*"The HCA-2200" has all the features and flexibility any audiophile could want..."* notes Stereophile.

*product against which other amplifiers can be measured. If an amp of equal or greater price isn't at least as good as the HCA-2200", it doesn't cut it."*

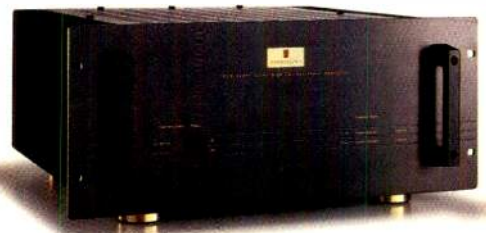
It's clear that Mr. Stone has discovered the virtues of our amplifier. And while we're pleased he found the process so enjoyable, we aren't surprised. It's all part of our design philosophy, whose essence he captures nicely when he says, *"...a middle-class audiophile like myself no longer has to take out a second mortgage on his house to afford a musically satisfying amplifier."*

# “...A BENCHMARK PRODUCT AGAINST WHICH OTHER AMPLIFIERS CAN BE MEASURED.”

— STEVEN STONE, *STEREOPHILE*, VOL. 17 NO. 3, MARCH 1994

But what did surprise us, as well as flatter us, was being thrown into the ring with \$12,000 monoblock behemoths. The result of this apparently absurd comparison? Not carnage, but rather: *"...the Parasound HCA-2200" gives them all a run for the money, and even beats 'em in flexibility and price."* He continues, *"...a pair of HCA-2200"s performed with Apogee full-ranges on a par with a pair of Boulder 250 AEs and four VTL Deluxe 300 amps. Dynamic impact and attack were excellent...Compared to the VTL300, the HCA-2200" had a greater sense of extension..."*

Enough quotes. It's time to experience one yourself. Just visit your local Parasound dealer and learn that "benchmark" is the expert's way of saying you don't have to break the bank to get the best. And you can quote us on that.



*"...prodigious bass output and sense of unlimited power and effortlessness,"* says Stereophile. And no wonder. It delivers over 90 amps of peak current per channel.



**PARASOUND**  
affordable audio for the critical listener

Parasound Products, Inc. 950 Battery Street, San Francisco, CA 94111 • 415-397-7100 • Fax 415-397-0144

# ALTEC LANSING AC10 COMPUTER AUDIO CONTROLLER



**W**ell, this may not exactly be the “breakthrough” that’s claimed in an Altec Lansing technical bulletin, but it is a fun toy if your computer includes CD-ROM or other audio sources. The AC10 Computer Audio Controller comprises a user interface (remember, we’re talking computers here) and a wall-mount junction box. The former is a handheld controller tethered to the latter via a multiconductor cable. An a.c. step-down transformer/converter sup-

plies 15 V d.c. to the junction box, which has three stereo audio inputs, one microphone output, and dual stereo outputs as well as two RJ-11 jacks for a single-line telephone. In a typical setup, one input would accept the audio output from your computer’s sound card, and one output would be routed to your audio system. The mike output can be routed back to the sound card’s mike-level input, if there is one.

Three small pushbuttons in the center of the controller permit each audio input to be independently

toggled on or off, and an LCD alternately shows volume, bass, treble, and balance—all controlled via the large “Function” button and the “Down” and “Up” buttons. Five LEDs immediately below the LCD indicate the status of the three audio input lines, the built-in microphone, and a telephone. The controller has separate rotary knobs governing headphone and mike levels for an optional communications headset (Altec Lansing AHS10 or similar). If a telephone line is plugged into either RJ-11 jack on the junction box, the controller’s “TEL” LED blinks to signal an incoming call. However, unless you happen to be gazing in the right direction at the right time, you probably won’t notice it. You can turn on a ringer in the junction box—or better yet, plug a regular phone into the spare RJ-11 jack.

Operating the AC10 is not difficult, but it might become a bit more intuitively obvious with slight layout modifications. Although the “MIC” LED is to the immediate right of the “TEL” LED, the on/off pushbuttons for these functions are in the opposite order. Furthermore, the rotary headphone level control is immediately beneath the mike on/off button, and the mike level control is beneath the telephone on/off button.

Plugging a headset into the jack on the controller automatically mutes the feed to your audio system, which is nothing more than what usually happens whenever a pair of headphones is plugged in. However, this means that if you are listening to music through your loudspeakers

when a call comes in, it’s necessary to plug in the ‘phones in order to take the call over the headset. This is no big deal, of course, but it might be nicer to be able to leave the headset plugged in and to handle the headphone/speaker selection with a switch on the controller.

**SERIOUS MULTIMEDIA  
USERS DON'T NEED  
THE AC10, UNTIL THEY  
LEARN THAT IT EXISTS.**

**Company Address:** Routes 6  
and 209, Milford, Pa. 18337.  
For literature, circle No. 94

The AC10 overcomes at least one minor annoyance of multimedia audio. In order to adjust playback level as you browse a CD-ROM encyclopedia, or simply play background CD music while your word processor churns out reviews for prestigious audio journals, you first need to find your on-screen level adjuster. Chances are it's buried under a bunch of other applications. To avoid the hassle, simply preset the audio to a convenient level and then use the AC10 controller to ride gain as needed.

If an incoming call interrupts you, press the telephone on/off button to mute the audio and, if a headset is plugged into the controller, answer the call. For two-way conversation, use the controller's built-in mike, in case the headset doesn't have its



Headphone-out and mike-in jacks on the AC10 allow use of 'phones like the optional Altec AHS10.

own. (If you don't have a headset, you'll have to remember to pick up the phone, just like in the old days.) If you like, you can click the audio back on again, so both you and your caller can hear whatever you were listening to. This could be *very* helpful when calling a technical-support representative to describe an audio problem, although better control over the voice/music balance would help improve this feature.

The Altec Lansing AC10 Computer Audio Controller, whose suggested price is \$250, is one more of those accessories that serious multimedia users really don't need. Until they learn of its existence. Then, everybody needs one. *John M. Woram*

**SUPPORT  
RESEARCH.**

It Works Wonders.

American  
Heart  
Association



# THIS SPEAKER CAN KEEP YOU UP ALL NIGHT.



A few notes of music will tell you the new Centaurus Slant 6 speaker is quite unique.

Its ribbon hybrid design offers performance that defies its modest \$1995 price.

As the Centaurus weaves its magic, an evening's listening session can pass into morning, leaving you with a smile.

The technology that makes this level of performance possible was pioneered on our \$85,000 state-of-the-art Grand System. Your nearest Apogee dealer will be happy to demonstrate the Centaurus speakers. But bring your pajamas, just in case.

—APOGEEACOUSTICS, INC.  
35 York Ave. Randolph, MA 02368 Tel. (617) 963-0124 Fax (617) 963-8567

# MARK LEVINSON NO. 38S PREAMP



The audiophile preamp is an exotic passion. The few preamps that still have a built-in phono stage tend to differ audibly in noise and some aspects of apparent frequency response—particularly when they have to provide gain for today's ultra-low-output moving coils. However, only a small fraction of audiophiles now buy a preamp with a phono stage, and an increasing number of vinyl addicts now use a separate phono unit. Most U.S. high-end audiophiles have also rejected preamps with extensive equalization, signal processing, tone controls, or filters. The trend has been very much in the opposite direction—toward eliminating any control feature or component in the signal path that might interfere with the signal. Audiophiles may want preamps that can control complex systems, but they want purer and purer sound.

The result is that most audiophile preamps now are, like the Mark Levinson No. 38S, line-stage models with only limited gain and no equalization. Virtually all such preamplifiers have evolved to the point where their frequency response and distortion measurements are so good that most theory indicates that the human ear will likely have difficulty detecting any of the differences between them. From a subjective viewpoint, most audiophiles agree that the preamp is the least colored major component in an audio system. The speaker especially, but also the digital or phono signal source, the amplifier, and the listening room each do more to affect the sound quality of a system than the preamp.

Yet few high-end audiophiles would dream of treating the sonic differences between preamps as unimportant. Regardless of theory and measurement, and some broad similarities in sound quality, preamps still play a critical role in shaping the transparency of a system. They may only differ in sonic nuance, but these nuances affect musical dynamics, often have a test-bench-defying impact on apparent timbre or warmth, and play a major role in soundstage presentation and the ability to hear low-level detail, transient information, and harmonic resolution in the music.

The Mark Levinson No. 38S remote-controlled preamp is a particularly good example of the kind of preamp that high-end audiophiles currently desire. On the one hand, it is a purist device. It is a "special edition" of the No. 38, which was introduced in October 1993. Like the No. 38, the 38S is a fully balanced, solid-state preamp with advanced gain, power supply, and switching circuitry. The circuit topology and active and passive components of this preamplifier have been selected as much on the basis of extensive comparative listening tests as on the basis of engineering theory.

Also like the No. 38, the 38S provides volume and balance adjustments of 0.1 dB. It is a dual-mono design, and it emphasizes every possible way of isolating the different functions, in order to reduce noise and interaction between components. The output stage is designed to allow long runs of cable to the amplifier. Further, the only controls designed to affect the sound of the

**MARK LEVINSON'S  
NO. 38S PREAMP IS  
A GOOD EXAMPLE OF WHAT  
HIGH-END AUDIOPHILES  
CURRENTLY DESIRE.**

**Company Address:** c/o Madrigal  
Audio Laboratories, P.O. Box  
781, Middletown, Conn. 06457.  
For literature, circle No. 95

Photo: Michael Groen

ONCE YOU'VE GOT A  
PAIR OF OUR SPEAKERS,  
THIS WILL BE THE ONLY  
TIME YOU'LL HAVE A BAD  
LISTENING EXPERIENCE  
IN YOUR CAR.



Welcome to  
**GETTYSBURGER**

"An  
Honest  
Meal"

Place  
order  
here

©1994 Pioneer Electronics (USA) Inc., Long Beach, CA



*When you pull up to a fast food drive-thru, the speaker outside your car shouldn't remind you of the ones in it. But if it does, it's time you retrofit your ride with some Pioneers. Our speakers are crafted from a unique blend of materials designed to give you lower distortion. Higher sensitivity. And plenty of pavement shaking bass. So give us a call at 1-800-Pioneer, ext. 301. We'll make sure you never have to listen to bad sound in your car again. Except, perhaps, when you're hungry.*

 **PIONEER**  
The Art of Entertainment

Enter No. 35 on Reader Service Card

unit, aside from the volume and balance control, are a polarity-reversal switch and a muting control, as in the No. 38.

The No. 38S, however, uses very different passive components from the No. 38. It uses a new four-layer circuit board and special circuit-board materials to reduce noise and coloration and improve isolation. It uses a new mix of resistors and capacitors, chosen on the basis of extensive listening tests. The result is not intended to be a revolution, but the manufacturer does state in its literature that the No. 38S is the best preamp it has ever built.

On the other hand, the emphasis on minimal interference with the signal path scarcely means that the No. 38S is unsophisticated or lacks the kind of special features audiophiles associate with its \$6,495

price tag. It has full remote control over every feature. There are four inputs using RCA connectors, two sets of balanced inputs, and RCA as well as balanced outputs. There are two sets of unbalanced

outputs for recording, using completely separate signal and ground paths for monitoring and recording, and switches with hermetically sealed relays. All of the control systems are isolated from the audio circuitry by optical couplers.

Quite a number of special features allow you to "personalize" this preamp. You can, for example, assign an abbreviation or alias to any input, to label it. Each source can be adjusted so that they all have the same output level within 0.1 dB—quite a handy feature for comparing signal sources, if you happen to be a reviewer, and an excellent way of ensuring that your tuner has the same apparent volume as your CD player. The level of muting can be adjusted between 1 and 60 dB, in 1-dB increments—although few audiophiles are likely to program in just 1 dB of muting!

The 38S has special circuitry to allow it to be used in an audio/video system in such a way that the controls on the video processor control the video system and the controls on the preamp control the music system. If you have other Mark Levinson "No. 30" components, the 38S can com-

municate with their control features. Further, if you still are a vinylophile, you can use the Mark Levinson No. 25S phono preamp and PLS-226 power supply to provide an outboard phono stage for the 38S.

This Mark Levinson preamp does have competition, a lot of top-quality, high-end preamps with truly outstanding sound. As a result, you pay for nuance and you pay a lot for what ultimately are diminishing returns. Each extra additional bit of sound quality costs more than the last.

One sonic aspect of the No. 38S does make it stand out from the rest. If there is any preamp that is more silent or does less to color the sound of low-level passages, I very definitely have not auditioned it. A properly set up No. 38S comes as close to the sound of silence as any preamplifier

that I have heard. I made no attempt to measure comparative S/N ratios, but this unit communicates an amazing amount of low-level musical information and disappears into the noise floor of the rest of your system. This superior performance comes through time and again with well-recorded classical music, acoustic jazz, and live recordings that preserve hall sounds and natural ambience.

To evaluate the other aspects of its performance, I compared the 38S with my Krell KRC and Classé Audio DR-6 reference preamps—and used Pass Laboratories, Krell, and Classé Audio power amplifiers; Apogee Studio Grand, B & W 801 Matrix Series 3, and Thiel CS5i speakers, and AudioQuest and Wireworld interconnects. I also used a small custom-made tube line-stage preamp.

As you might expect, the differences in frequency response and timbre were minor. All four of the preamps had excellent deep bass and extended highs. The 38S did have a touch more apparent upper octave energy than the other preamps—a sound characteristic I have heard in other Mark Levinson equipment. The lower midrange was a little less warm than that of the other preamps. Its apparent deep bass went lower than with my tube preamp, matched the bass of the Classé Audio DR-6, and had a

bit less apparent energy than the Krell KRC preamp.

A lot of these minor differences in timbre seemed to be more the product of the way each preamp handled musical dynamics than of any inherent difference in frequency response. Extended listening to different records and CDs—with levels set to be the same at the listening position—indicated that the tube preamp made the midrange and lower midrange seem more dynamic than the transistor preamps, which accounted for its added touch of apparent energy in this region. This is a difference I have heard between many tube and transistor preamps in the past and is one reason some audiophiles are strongly committed to tubes while others prefer transistors. The Krell KRC seemed to slightly emphasize bass and upper bass dynamics. The Classé Audio and Mark Levinson preamps did not seem to emphasize any particular frequency but handled solo piano dynamics differently enough to give the two preamps slightly different timbres.

The soundstage, imaging, and depth on all four preamps were excellent, but each preamp reproduced these aspects of classical chamber music and acoustic jazz slightly differently. The Krell preamp and the tube unit had the most depth but a slightly different way of reproducing depth and front-to-back imaging. The 38S had the widest apparent soundstage but a bit less depth than the others. None of the preamps blurred imaging details or etched them in place. Each provided a musically natural soundstage, with slightly different ambience and imaging detail. Many of the apparent differences varied with the recording, but the Mark Levinson and the Krell resolved slightly more soundstage detail—with the Mark Levinson providing more apparent detail from the individual instruments and the Krell providing more information on the sound of the hall and more ambience.

Each preamp also reproduced transient and harmonic detail slightly differently. The Krell seemed to provide the most musical detail, but the Levinson provided more pure information. The tube preamp provided more apparent life or air to some recordings but could be slightly flat with others. The Classé had very well-balanced transient performance and harmonic detail

**THE EMPHASIS  
ON SIGNAL PURITY  
DOESN'T LEAD TO A LACK  
OF SPECIAL FEATURES.**

but was not quite as lifelike or musical as the Levinson No. 38S or the Krell KRC.

In terms of overall sound, no preamp emerged as "right" relative to the others—although the Levinson seemed to be the best performer with the Apogee speakers, and the Krell did best with the B & Ws. I never got anything but good sound with any of the combinations I tried, and the cumulative differences between preamps proved to be very similar in importance to the differences I hear between great orchestras or great concert halls—real, but very much matters of personal taste.

There are four ways you can approach a decision to buy a unit like the Mark Levinson No. 38S. First, you can simply treat the

**THE NO. 38S COMES  
AS CLOSE TO THE SOUND  
OF SILENCE AS ANY  
PREAMP I HAVE HEARD.**

38S as another of those unaffordable dreams. Second, you can buy it because you like its technology, styling, and features. Third, you can buy it because you know the Mark Levinson name and have the assurance that a Mark Levinson product will be one of the best preamps around.

It is the final way of making a decision, however, that makes being an audiophile fun. You can audition the 38S at a dealer, and if you are as impressed as I am, make arrangements with the dealer to try it out in your own system and listen for the nuances I have just described. You can also try auditioning some top competing tube and transistor preamps. This kind of comparative auditioning in your own system is ultimately the only way you are ever going to know how a top preamp really affects the sound you will live with and the extent to which it suits your taste. A good dealer demonstration can tell you a great deal about the general sonic differences between components, but even the best dealer demonstration will present some of the same problems as reading audio reviews. The best book on wine is not a wine tasting, and the best wine tasting is never equal to savoring a fine wine slowly in your home.

*Anthony H. Cordesman*

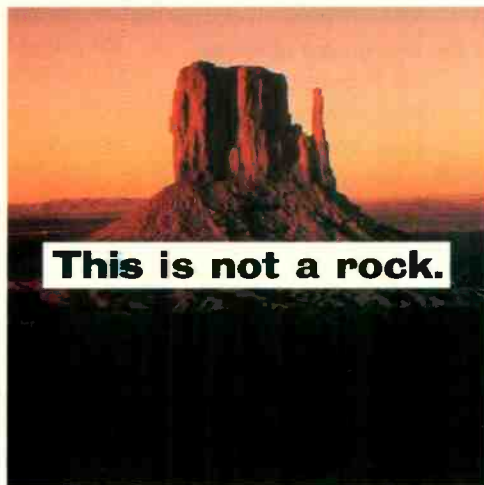
## A GREAT SOURCE FOR ADVENT<sup>®</sup> SOUND.



America's best value in speakers can be heard at Sears Brand Central. These versatile Mini-Advent II or Indoor/Outdoor Mini-Advent II speakers along with the Subwoofer III rival much bigger systems for room-filling bass, yet take up only a fraction of the space. Call 1-800-274-9555 for the Sears Brand Central location nearest you or for more information on Advent products.

**SEARS Brand  
Central**

©1994 Advent is a registered trademark of International Jensen Inc.



**This is not a rock.**

# CLASSICAL RECORDINGS



## the instrument of kings

Photograph: Epiphany Records



### The Instrument of Kings: A Program of 18th-Century Music for Flute and Keyboard

*John Solum, transverse flutes;  
Igor Kipnis, harpsichord and  
fortepiano; Arthur Fiacco, cello*  
EPIPHANY EP-2, CD; 69:48

This was the first item to appear on the new Epiphany label, though numbered 2. It features the label's artistic director, Igor Kipnis, on two period instruments out of that time of rapid change, the years of the 18th century, from early Handel through Mozart—the keyboard always as accompaniment and partner, continuo in the earlier music. Two differ-

ent period flutes are played by John Solum to suit different music. The cellist, Arthur Fiacco, fills out the continuo where appropriate.

John Solum is unusual in that he comes from a long career on the "standard" flute—that glamorous instrument of today with its complex of keys and levers, made from fancy metals including gold and platinum. Few flutists are willing to go back from this to the plain older instruments made of wood and with only a few helpful keys and lots of finger holes, as in the recorder. These two old flutes have only a single key—the rest, so to speak, is managed by coverup. Very tough for any musician used to playing the modern instrument.

Epiphany makes much of a desire to bring music to home audiences with the same impact as music in concert. A bit naive, that thought, yes? We've been searching for the best seat in the concert hall since the 1950s and even the 1930s. Whatever the philosophy, whether in high-brow terms or blatant advertising, most of us in audio now are aware that a listener to a recording is *not* in a concert hall, and we must approach him on that basis. (Especially for those who have never been in one!) The proof of the musical pudding—the result—is what matters on records. I have only one reservation here; in the continuo accompaniments, the cello is too prominent, where it should simply furnish an unobtrusive if interesting bass line.

**Rachmaninoff: Piano Concerto No. 2;**  
**Ravel: Piano Concerto in G Major**  
*Hélène Grimaud, piano;*  
*Royal Philharmonic Orchestra,*  
*Jesús López-Cobos*  
DENON CO-75368, CD; DDD; 55:04

The old saying that only a man can play Rachmaninoff's music is proved incorrect after hearing Hélène Grimaud play his Second Piano Concerto on this Denon CD. The concerto is one of Rachmaninoff's most famous works, and this recording is one you will want to own.

Grimaud entered the Paris Conservatoire at age 13. In 1985, she studied under the famous György Sándor and Leon Fleischer. Grimaud has given recitals and performed with many of the great orchestras in Europe, Japan, Canada, and the United States. Her luscious and strong playing on this disc attests to her love for both of these concertos. She is a very accomplished pianist at only 25, and I'm sure we will hear many more great things from her. Jesús López-Cobos and the Royal Philharmonic Orchestra generally perform well with Grimaud here.

The pianissimos in these works would be lost in an analog recording. In this digital disc, you can hear all of this marvelous music. Only in the beginning of the Rachmaninoff does the orchestra cover Grimaud's playing. The recording is very clear, dynamic, and well balanced.

*Ruth Whyte*





The harpsichord and fortepiano are perfectly balanced against the flute, though Kipnis is perhaps the biggest “star” on hand and also a Big Cheese in the Company. Good! The cello discrepancy, I would guess, is not in the playing so much as a matter of microphone balance.

An offshoot of the concert-like philosophy (and perhaps also of the radical recording and editing procedures from glass optical disc masters) is an unexpected and appealingly human fault at the start of the CD. The flutist is all nerves! Or so it seems. He plays a whole series of shaky tones noticeably out of tune, as one might at the beginning of a difficult concert. I groaned: Is this the best the man can do? But lo! After only a few moments, the sour notes disappear, and thenceforth—for almost 70 minutes—the performance, finger holes or no, is perfection and indeed virtuosic. I merely point out that, at least for a few hearings, the opening insecurity is appealing and in fact quite concert-like.

Note in passing that despite equal temperament, already many decades old, the earlier variety of “unequal” tunings persisted to an extent right into the 19th century; thus, ears were still adjusted to differences in temperament, as ours are not. Kipnis’ 1793 fortepiano is tuned not to equal temperament but to Thomas Young’s temperament No. 2 of 1800, whatever that may be. Note too that the overall pitch is correctly lower than ours, 411 for the harpsichord and 427 for the fortepiano. How’s that for exactitude?

P.S. Epiphany, in its concert semblance, likes to include an “Intermission” between major segments of the program. On this disc, the “Intermission” lasts 9 seconds. So much for concert realism. *Edward Tatnall Canby*

### Made in America: The Complete Works of William Russell

*Essential Music*  
MODE 34, CD; 52:13

So unknown he didn’t rate even a line in *Baker’s Biographical Dictionary of Musicians*,



William Russell is a pivotal figure in the history of music for percussion, predating and influencing percussion works of John Cage, Henry Cowell, Lou Harrison, and

others. This CD contains Russell’s entire output of eight works!

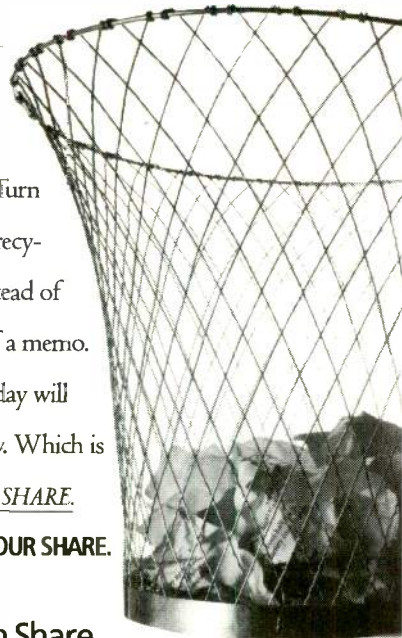
The American milieu of pop music and jazz gives Russell’s wild little experimental pieces their energy and snap. He combines a collage of Western and ethnic instruments from around the world with found objects

# BE LESS PRODUCTIVE AT THE OFFICE.

The office has always been a place to get ahead. Unfortunately, it’s also a place where natural resources can fall behind. So here are some easy ways to reduce waste at the office. Turn off your lights when you leave. Help set up a recycling program. Try drinking out of a mug instead of throwaway cups. And always use both sides of a memo. It’ll cut down on trash. Doing these things today will help save resources for tomorrow. Which is truly a job well done. 1-800-MY-SHARE.



**IT’S A CONNECTED WORLD. DO YOUR SHARE.**



**This is not a bird.**

# Give the Gift of Natural Sound This Holiday Season!

*"The most natural sounding of any discs made by any record company!"*  
 — STEREOPHILE



10038-2-F

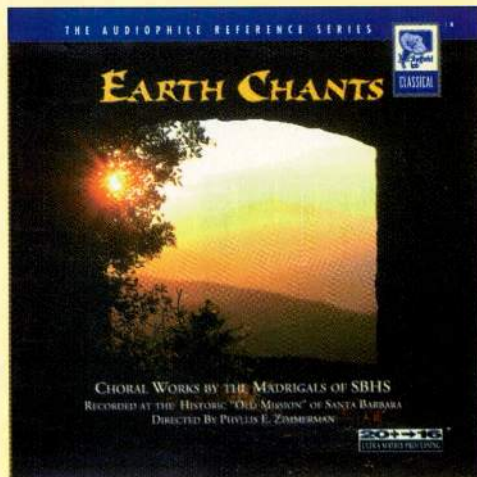
## A SHEFFIELD CHRISTMAS COLLECTION

It's the guests that make any party, right?

Look at the all-stars who showed up at our holiday bash:

Dave Grusin, Lincoln Mayorga, Ron Carter, Pat Coil, Phil Perry, Tom Scott, Michael Ruff, John Patitucci, Maxine Waters, Margie Gibson, Michael Newman, Larry McNeely, Lee Ritenour and many more!

Sheffield Lab proudly presents our first Christmas release, celebrating 25 years as the premier audiophile recording company. Twelve beautiful tracks are centered around the theme of children, the holiday season, and Christmas. The Christmas Collection is sure to please long-time collectors of our recordings, and serves as the perfect introduction for newcomers to the award-winning "natural sound" of Sheffield Lab. This disc belongs in every music lover's stocking this year!



10049-2-F

## EARTH CHANTS: Choral Works by the Madrigals of SBHS

A California tradition for over a quarter century, the Madrigals of SBHS, under the direction of Phyllis E. Zimmerman, have earned resounding praise on six European tours, and continue to elevate the art of choral singing. The Madrigals give expression to what unites all people in all faiths: The need of the human spirit to give expression to its longing for what is lastingly true, noble and beautiful. Recorded and mastered by our own Doug Sax using Sheffield's custom-built analog tube technology, the remarkable sound will leave you breathless. *Proceeds will be donated by Sheffield to a scholarship program for local high school students pursuing advanced studies in a music-related field.*

**20+→16**  
ULTRA MATRIX PROCESSING

Available from:



Also available from other fine record stores and specialty audio retailers.

To receive a catalog describing Sheffield Lab's many other titles, call 805-969-4744 or fax 800-576-5640.

**LIVE STUDIO RECORDINGS**



Setting the Standard for 25 years: The award-winning "Natural Sound" of Sheffield Lab Recordings is recognized around the world as the reference standard for audiophile excellence. Custom electronics throughout the entire recording chain, plus our legendary "live to two-track" engineering, combine to deliver all the musical excitement created by world-class musicians in live sessions.

and homemade instruments, together with unusual methods of playing instruments. His integration of jazz and new sounds in percussion took him to the point where he soon stopped composing, feeling that the New Orleans jazz musicians were making up more interesting music than he could write.

Several sections of his works have various dance titles and rhythms, such as Waltz, March, Tango, Foxtrot, and Rhumba. Some compositions, such as "Chicago Sketches" (1940), employ sound effects and verbal comments in an obvious on-the-spot improvisation. The major work is the 17-minute score for the ballet *Ogou Badagri*, which can include up to 70 dancers. The Essential Music trio of percussionists has presented more than 50 premieres in its continuing New York concert series. *John Sunier*

**Charles Koechlin: The Jungle Book  
(Symphonic Poems After  
Rudyard Kipling)**

*Iris Vermillion, mezzo-soprano; Johan Botha, tenor; Ralf Lukas, baritone; RIAS Chamber Choir; Berlin Radio Symphony Orchestra, David Zinman*  
RCA RED SEAL 09026-61955-2  
Two CDs; 88:49

Though a long list of Charles Koechlin's works is found in the current *Schwann Opus*, a complete disc of his greatest achievement has not appeared as of this writing. Yet two versions have been issued of this massive set of symphonic poems that grew out of his fascination with Rudyard Kipling and especially



with *The Jungle Book*. First was a CD on the Marco Polo label which limited itself to the four strictly orchestral works of the cycle. Now this double-disc "world premiere recording" adds the vocal work, Three Poems, Op. 18. It benefits from greater clarity in the sonic department, to boot.

Koechlin attached such importance to *The Jungle Book* that it occupied him for over half a century—up to his death in 1950. The first of the three songs, "Seal Lullaby," recalls Debussy; the second is "Night-Song in the Jungle." Third is the "Song of Kala Nag," in which the elephant sings of his yearning for the forest. Three soloists and a chamber choir augment the orchestra for the opening section.

The first of the four tone poems to follow, "The Spring Running," is actually from the end of the book, when Mowgli has become a man and takes leave of his friends. "The Meditation of Purun Bhagat" concerns a maharajah's prime minister who becomes a hermit-guru. "The Law of the Jungle" paints the

**AUDIO  
SUBSCRIBER SERVICE**



Place  
label  
here

**1(303) 447-9330**

**AUDIO  
P.O. Box 52548  
BOULDER, CO 80322**

**MOVING?** Please give us 8 weeks advance notice. Attach label with your old address, and write in new address below.

**RENEWING?** Check box below and attach label with corrections marked, if any.

**SUBSCRIBING?** Check box and fill in coupon. For gift subscriptions attach a separate sheet.

**Send Audio for 1 year at \$24.00**

- New subscription     Renewal
- Payment enclosed     Bill me

*Canadian orders add \$8 per year.  
Foreign orders add \$8 per year.*

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_

ZIP \_\_\_\_\_





# At one time you understood how this worked.



**FIVE BLOCKS MADE A COTTAGE**, ten a castle, and a hundred your own private empire. With Linn components, it's just that simple. You can start out with the system that's right for you today and, using our building-block approach, improve and expand your system over time in affordable steps. Some steps will improve the performance of your system, others will expand your system throughout your home, but each and every step has one thing in common. It delivers more music.

**PEOPLE NEED MUSIC.** Music is important. Exploring the world of music in the comfort of your own home is therapeutic. It will help you relax, stimulate your imagination, change your mood, and provide entertainment and pleasure for your whole family.

**1-800-LINN HI-FI**

*music for life*<sup>™</sup>

**A SOUND INVESTMENT.** At our innovative factory in Scotland, we produce the most advanced and best sounding hi-fi. Skilled and dedicated people and our unique single-station-build philosophy ensure a standard of construction and reliability

simply not possible on a production line. And, with your Linn retailer on hand to provide assistance long after your initial purchase,

you can expect your hi-fi to last a lifetime. People who love music have built our business, so we look after them. **MUSIC FOR YOUR LIFE.** To learn more about Linn Hi-Fi and the many ways in which Linn can make music a more important part of *your* life, phone Audiophile Systems, Ltd., our U.S. distributor, at 1-800-546-6443.

mysteries of the jungle with orchestral effects reminding one of Koechlin's strong attraction to Hollywood films. Finally, "Les Bandar-log" humorously portrays Kipling's monkeys as slavish followers of current fashions in music; one group is recognized by its neoclassical style, another group by its atonal style, and still another by its polytonal style. Near the end of the piece, the cacophony is put to flight, and the jungle again becomes serene.

John Sumier

**Tavener: To a Child Dancing in the Wind; Lamentation, Last Prayer, and Exaltation; A Mini Song Cycle for Gina; Melina**

Patricia Rozario, soprano; Kathryn Lukas, flute; Stephen Tees, viola; Helen Tunstall, harp; Iain Simcock, handbells;

John Tavener, piano

COLLINS CLASSICS 14282, CD; 52:39

If you like Henryk Górecki's Third Symphony and related "minimalist" works by Arvo Pärt et al., tune in now on John Tavener (born 1944—and not to be confused with John Tavener, who lived from about 1490 to 1545). Here we have yet another religious mystic (in Tavener's case, Greek Orthodox), who proclaims his aesthetic purpose as the creation of "ikons," characterized by simplicity, ritual, and mythology, for a time in which he feels "man has lost his belief not only in God, but also in himself."

The huge success of Tavener's earlier *The Protecting Veil* swiftly made him, too, a kind of cult figure. Whatever his religious overtones, he also has terrestrial interests: He wrote this disc's closing work *in memoriam* of Melina Mercouri, whom he had known as Greece's Minister of Culture.

Patricia Rozario has the vocal agility of a mountain goat, plus a voice of considerable beauty and expressivity. Anti-minimalists may find this music insufferably monotonous; pro-minimalists will probably clasp it to their hearts.

Paul Moor

**Earl Wild: Variations on an American Theme ("Doo-Dah"); Gershwin: Concerto in F**

Earl Wild, piano; Des Moines Symphony Orchestra, Joseph Giunta  
CHESKY CD 98, CD; 55:04

Elderly pianists rarely fade away! Earl Wild is typical. He has been around for a large part of this century, yet his piano fingers are still as furiously active as they were when I, too, was young, and listening. He was—the pun is

# INCREDIBLE SYSTEM. INCREDIBLE PRICE.



America's best value in car audio can be heard at Best Buy.

These powerful Jensen® components have the precision to pull in even the most remote stations and the power to crank out the hottest tunes in your tape collection. Call 1-800-753-4446 for your nearest Best Buy location or to get more information on all our value-priced Jensen products.



©1994 Jensen is a registered trademark of International Jensen Inc.

COLLECTOR'S EDITION



It's a sonic boom.



MasterSound CDs are the definitive versions of classic albums, all produced to the highest possible standard. With 20-bit digital transfers from the original masters, you'll think you're in the studio with the artist himself. The MasterSound series features over 3 dozen titles including new releases from Meatloaf, Robert Johnson, Basia, Indigo Girls®, Boston, and Blood, Sweat and Tears.

Get all the music. MasterSound.

For more information about other great Legacy releases, write to:  
SBM, Legacy - MasterSound, Radio City Station, P.O. Box 1526, New York, NY 10107-1526



Legacy and It's a Sonic Boom are trademarks of Sony Music Entertainment Inc. © 1994 Sony Music Entertainment Inc.

**FIELD: PIANO CONCERTOS  
NOS. 2 AND 3**

John O'Connor, piano; Scottish Chamber Orchestra, Charles Mackerras  
TELARC CD 80370, CD; DDD; 64:18

The perfect gift for your Irish friends next St. Patrick's Day: Major works by the only Irish composer ever to attain significant international importance, performed by one of Ireland's few progeny ever to make it in the international concert field. If conductor and orchestra fall short of authentic Hibernianism, at least they do qualify as Celts.

John Field, born in Dublin in 1782 and mostly educated there, showed such talent as a child that Muzio Clementi taught him



for seven years. He spent his later years mostly in Russia, where he enjoyed exceptional success and where these works appeared in print in 1816. His musical tastes inclined more toward the lyrical than the pyrotechnic; upon hearing Liszt rip up the keyboard, Field mildly asked his neighbor, "Does he bite?" Chopin's contemporaries sometimes asked him whether he had actually studied with Field.

From Field, Chopin appropriated the term nocturne, and the slow middle movements here give us Field in his essence: Elegant, introspective, gentle, searching the depths of his precociously Romantic soul. O'Connor and his cohorts provide outstanding performances, lucidly recorded. *Poul Moor*

inevitable—a wild, youthful performer who could intimidate a whole orchestra with his torrents of notes. He is the same today.

The feature work here is, for most of us, the Gershwin Concerto in F, one of his later pieces, surprisingly dissonant and surprisingly seldom played, nor the easiest Gershwin for listening. But on this CD we hear first a considerably longer, weightier, more pretentious piece by—who else?—the pianist himself. Frankly, though it may be a world premiere,



this is music that surpasses Gershwin in the wrong ways (every aspect of technique, piano, orchestra) and yet is inferior in real musical interest, though it has its

moments. Too long, too laboriously complicated, too derivative (notably Rachmaninoff but, ever so clearly, also Gershwin). Gershwin's concerto is shorter, simpler, more direct, and far more innovative. In spite of the complexity, that innocent old tune "Doo-Dah" (which everyone in my generation knows by heart) is all too obviously present in every segment of the Wild music. The idea that a pop tune in symphonic guise will provoke roars of laughter is a bit out of date by this time. And the treatment is so elaborate. Not good. I'd hate to have to explain why, where Beethoven's variations on equally unprofound tunes reach into the sublime! Give me a whole issue of this mag. . . .

This is a new Chesky digital and beautifully done (they do lots of restorations). Just the right balance between fiery pianist and big-gish orchestral ensemble—not easy to achieve with a pianist like this!

Performance? You can count on Wild. He heard Gershwin himself play this concerto, a number of times; he is of the period too, more or less. He gets Gershwin exactly—that

nervous, enthusiastic rush at each piano entrance (or, alternatively, the dramatic pause, fingers raised), coming in almost recklessly, so glad to be playing again! That's Gershwin, if with a touch here of Rachmaninoff grandeur. The orchestra, curiously, is two-thirds splendid. There is superbly understanding wind and woodwind playing, notably in the slow middle blues. But not in the strings. These gentry are note-perfect but seem at a loss. They simply do not feel the grand, triumphant Gershwin melodies, soaring so joyously up and out, loud and clear! They play the notes, listlessly. Maybe this is their first-ever Gershwin? Sounds that way.

*Edward Tatnall Canby*

**Ibert: Escales; Flute Concerto; Paris; Bacchanale; Hommage à Mozart; Bostoniana; Louisville-concert**

Montreal Symphony Orchestra,

Charles Dutoit

LONDON 440 332-2, CD; 79:00

"Escales," the first work here from the important 20th-century Parisian composer Jacques Ibert, is probably his best-known piece; it was inspired by a Mediterranean cruise while he served in the French navy. Ibert's music is as dapper and fastidious as he was, neoclassic and impressionistic, often with an element of humor. Great melodies, opulent harmonies, and colorful instrumentation are hallmarks of Ibert's style.

The Flute Concerto, the longest work on the disc, is one of five concertos conceived in chamber rather than symphonic terms. Timothy Hutchins' flute is allowed to emerge without having to fight the orchestra to be heard.

Ibert's short Mozart homage was created for the 1956 bicentennial and points up some similarities between the two composers in the

wit department. The Louisville piece was a commission from that bullish-on-contemporary-composers orchestra and is Ibert's answer to Gershwin's "An American in Paris." And Ibert's symphonic suite "Paris" is a tongue-in-cheek musical postcard of the City of Light. Within six brief movements, often under two minutes each, it sketches scenes including the Metro, the Paris mosque, a tourist boat on the Seine, and a bistro in the Bois de Boulogne.

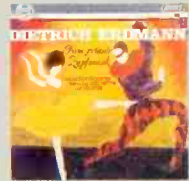
Charles Dutoit and his *amis* can't go wrong with French repertory, and London's sound is smooth and rich, but resounding when that is required. *John Sunier*

**Erdmann: Konzertante Zupfmusik  
(Concertos for  
Plucked Instrument Orchestra)  
Landeszipfchester Berlin, Joël Betton  
THOROFON CTH 2213, CD; 59:16**

Performing by ensembles of guitars or mandolins began with amateurs in Europe early this century, and the players had to use arrangements at the beginning. But in the 1920s, specific literature began to be published. In the 1950s, guitarist Siegfried Behrend suggested to composer Dietrich Erdmann that he write something for plucked instruments. So far, Erdmann has composed 15 works, and seven of them are on this unusual CD.

This is neither amateur-level beginners' music nor academic German dodecaphony. The various little works here—including two serenatas, a sonatine, a notturno, and a divertissement—are accessible serenade-like pieces that could be modern versions of Mozart's similarly functional and named pieces. Some are for "guitar choir" alone and others for guitar and mandolin combination ensembles. An oboe, recorder, piano, and percussion augment the main ensemble to contribute more varied sound; other than a single sonatine for mandolin and piano, all the works involve the sonic signature of the plucked ensemble.

The richly nostalgic sound of massed plucked instruments has always appealed to me, but the few recordings I've found of such material are either MOR or heavy schmalz. These lovely Erdmann pieces offer intelligent, contemporary chamber music featuring this entrancing, plucky sound. It appears that the leading-edge transients of plucked instruments place them spatially more solidly than other instruments if the recording's good; Thorofon's is. *John Sunier*



SMIRNOFF® VODKA 40, 45.2 & 50% Alc. by Vol. Distilled from the finest grain.  
©1994 Ste. Pierre Smirnoff/FLS, Division of Heublein, Inc. Albany, NY. Made in U.S.A.



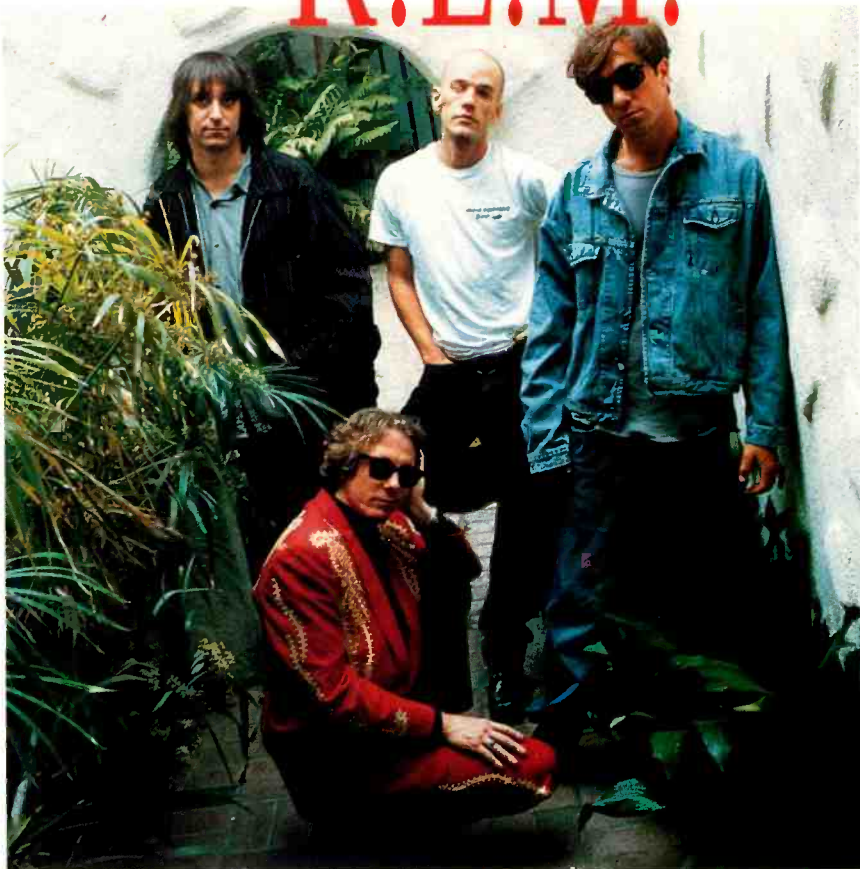
PURE JOY.

**SMIRNOFF**

Distilled under the supervision of  
world-famous Pierre Smirnoff  
DISTILLED BY STE. PIERRE  
ALLEN

# ROCK~POP RECORDINGS

## R.E.M.



### Monster R.E.M.

WARNER BROS. 9 45740-2, 48:16  
Sound: B+, Performance: B+

**S**eemingly, R.E.M. is juggling two disparate personas. One is the videogenic, award-showered, MTV popster; the other yearns to travel an uncompromisingly artistic high road, challenging itself, experimenting and evolving. In the “unplugged” age, the band has gone electric with *Monster*, a garage-rock behemoth that distances itself from the precision pop of 1991’s *Out of Time* and the campfire-side quality of ’92’s *Automatic for the People*. Certainly, the jangly, Byrds-like elements

from R.E.M.’s earliest days seem like ancient history.

But the common thread between *Monster* and its siblings is how they

share weird and perverse moments. On “Tongue,” the enigmatic Michael Stipe cops an Eddie Kendricks-style Motown falsetto while the track rumbles along with piano, percussion, and organ. “Let Me In” puts his pleading but nearly indecipherable vocals behind a wall-of-guitar distortion track devoid of drums, sparingly ornamented with tambourine and organ. It’s an urgent and poignant song dedicated to the memory of Kurt Cobain (with whom Stipe was collaborating just prior to the Nirvana singer’s suicide).

“King of Comedy” is by far *Monster*’s strangest pursuit, a noisy, percussion-driven excursion with bass, fuzz-tone guitar, and a bombastic yet danceable beat that underscores Stipe’s processed and barely audible vocal. It sounds like Nitzer Ebb meets *Achtung Baby*. With Stipe whispering a refrain like “I’m not commodity,” he seems to be venting at the dehumanizing, mass-marketing process of the music industry as he grapples with art versus commerce.

But *Monster*’s best moments take the form of garageland rock ’n’ roll. The layered, delayed voices of “Star 69”—with words directed at the plethora of 1-900 phone numbers—and the tremoloed guitar of “Crush with Eyeliner” are two examples of this whacked-out but unabashedly fun sound.

“Circus Envy” is *Monster*’s very best offering, showcasing Peter Buck’s grunge update of surf guitar.

Photograph: Keith Carter



### Beat THE Retreat

Songs by Richard Thompson  
Various Artists  
CAPITOL CDP 7 95929 2 0, 66:56  
Sound: A, Performance: B+

**T**ribute albums seem to be a dime a dozen, with results varying greatly. *Beat the Retreat* isn’t the first such album honoring Richard Thompson and his work, but it qualifies as one of the best tribute efforts to date. Highlights include

X’s sizzling “Shoot Out the Lights,” Bob Mould’s “Turning of the Tide,” Los Lobos’ “Down Where the Drunkards Roll,” and the Shawn Colvin/Loudon Wainwright III duet on “A Heart Needs a Home.” While there isn’t a lot of experimentation in the arrangements, the songs still receive fresh insight. Thompson has long been very underappreciated by the public, though not by his colleagues. Here’s hoping that *Beat the Retreat* will help correct this situation.  
Michael Tearson



# The Sweet Sound of Vinyl is Back!

- Original Generation Master Tape Source
- Half-Speed Mastered with The GAIN System™
- Specially Plated and Pressed on 200 grams of High Definition Vinyl
- Dust Free - Static Free Rice Paper Inner Sleeves
- Special Protective Board
- Heavy Duty Protective Packaging
- Super-Fi Super Stars Limited Edition

**NEW RELEASE**



**MFSL 1-211**

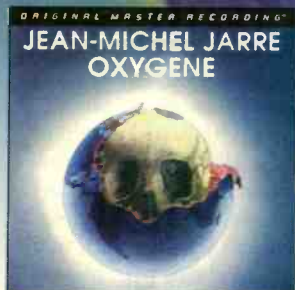


**NEW RELEASE**



**MFSL 1-215**

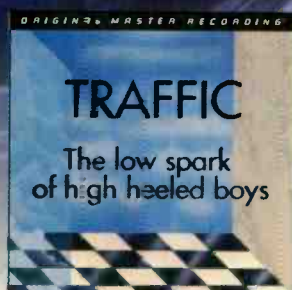
**LISTEN...**



**MFSL 1-212**



**MFSL 1-210**



**MFSL 1-209**



**MFSL 1-208**



*The Tradition Continues at Mobile Fidelity Sound Lab.*

Also available on Anadisq: MJQ • Alaa Parsons • Emerson, Lake & Palmer • Pink Floyd • Muddy Waters • Manhattan Transfer

Come see us at the Sahara (5130A) in Las Vegas during CES, January 6-9, 1995



105 Morris Street • Sebastopol, CA 95472 • 800-423-5759

e-mail: [mofi@mofi.com](mailto:mofi@mofi.com)

Enter No. 25 on Reader Service Card

Closing out the set is "You," an uneasy, apocalyptic procession of doom (à la *Rust Never Sleeps*). Here, Buck's guitars are distorted to the point of virtual disintegration.

R.E.M.'s last two albums were quiet vehicles for Stipe's lyrical and vocal concepts. *Monster*, however, is undeniably one for Buck's guitar and his trophy rack. And while a few songs impress like rewrites from earlier efforts, the album ultimately succeeds—proving that 12 years and nine studio releases later, R.E.M. can still return to a dank, musty little basement in their hometown of Athens, Georgia and leave with a motherlode of an album.

Tom Ferguson

### Teenage Symphonies to God

Velvet Crush

SONY 550/EPIC BK 64442, 45:54

Sound: B+, Performance: B

Velvet Crush's saving grace is their songs—excellent, melodically sentimental slobbery that actually strikes a chord of sincerity. Otherwise, you'd confuse the band with a whole lot of other '90s noisemakers with a thing for rock's golden age. This Providence trio isn't serving up anything groundbreakingly new or different, yet they're so obviously infatuated with rock's long history as a popular music—like a bunch of slackers who blow the rent

money at used record stores—that you can't help but like 'em.

And covering Gene Clark's "Why Not Your Baby" can only be described as classy. Velvet



Crush does its thing like wide-eyed fan club presidents, owing much to everyone from Gram Parsons to Big Star to Television. The influences are there, but the Crush originals—while sounding very familiar—are uniquely their own, conveying sentiments pertinent to the shock of turning 30 or getting dumped. Producer Mitch Easter supplies all the right touches.

Mike Bieber

### Soma City

Kevin Salem

ROADRUNNER RR8979, 51:52

Sound: B, Performance: B+

Kevin Salem's lauded reputation as a guitarist/producer for artists like Freedy Johnston, Yo La Tengo, and Madder Rose helped pave the way for his own album, *Soma City*. Not surprisingly, guitars predominate here—more than the songs, more than Salem's Elvis Costello-like vocals, and almost muscling in on his rhythm section. Ultimately, it's a three-chord crunch that stays with you, not so much a lyric or melody or chorus.

But under the right circumstances—and *Soma City*'s one of them—there's nothing wrong with that. Salem writes with honesty and soul, elements so often missing from meticulously crafted, radio-ready pop songs. Even his guitar tone reeks of the kind of "play-me-loud" unpretentiousness that'll keep you interested.

Having said that much, *Soma City* still offers examples, albeit sporadically, of Salem's knack for catchy songwriting, first with the uncompromisingly melodic "Falter" and then with "Deeper Hole." Veteran Neil Young producer Niko Bolas proves to be an excellent choice, capturing Salem's honesty much the way he did with Young and Crazy Horse—an undeniable influence.

Mike Bieber



### Grace

Jeff Buckley

COLUMBIA CK 57528, 51:49

Sound: B+, Performance: B

Hailed far and wide as the next big thing, Jeff Buckley has the talent and potential to be a great rock singer and, one of these days, an

"Clearly the best sounding audiophile label recordings today." The Absolute Sound

## New From AudioQuest Music



### DOUG MACLEOD *Come To Find*

with special guest  
Charlie Musselwhite

AudioQuest Music is proud to add one of the brightest singing and songwriting talents in blues to its roster. *Come To Find* is the sound of a consummate bluesman touching the core of his art. Doug is joined by Charlie Musselwhite and The Mighty Flyers' rhythm section, Jimi Bott and Bill Stuve.

AQ 1027



### KEI AKAGI *Mirror Puzzle*

featuring Rick Margitza,  
Charles Fambrough and  
Willie Jones III

Pianist and composer Kei Akagi has assembled a crack working band of contemporary jazz masters consisting of fellow Miles Davis alum Rick Margitza on sax, bass master Charles Fambrough and the young drumming sensation from LA, Willie Jones III. *Mirror Puzzle* captures the group at its peak. Pure musical magic!

AQ 1028

AVAILABLE AT ALL

TOWER RECORDS VIDEO

TO ORDER BY PHONE OR  
RECEIVE FREE CATALOG  
CALL 800-474-1977

Member of  
NAIRD

audioquest  
MUSIC

State of the Art Music/State of the Art Sound

P.O. Box 6040 San Clemente CA 92674 USA PH (714) 498-1977 FAX (714) 498-6223

AUDIO/DECEMBER 1994

112

# And now, for something completely different

**Introducing Linaeum®-design mini speaker systems from Optimus®.** What makes them so very different, in large part, is the revolutionary Linaeum "True Line-Source Driver™" tweeter. Unlike conventional cone or dome drivers, this ferrofluid-cooled tweeter employs a highly flexible, rectangular polyester diaphragm which radiates a dramatic wide-open,

crystal-clear sound image. Think of how a guitar or violin string vibrates and you start to get the idea of how it works. **Wide-Angle Sound?** Yes... 180 degrees of horizontal dispersion in the two monopole models and a full 360 degrees in the top-of-the-line dipole version. Highs to 25 kHz, without distortion. Exceptionally smooth crossover between tweeter and woofer provides seamless response, without

the mid-range dropoff often found in other 2-way systems. Ported enclosures and extra-long-throw woofers produce surprisingly solid, deep bass. **Affordable?** **Very affordable. From \$99.99 to \$149.99 each.** You simply can't find a better speaker system for the money, anywhere. It's a whole new way of listening... hear it for yourself today.



Optimus PRO LX5 with 2x4" dipole tweeter for 360° sound dispersion, and 5" polypropylene woofer. 10½" high.

**OPTIMUS®** SM  
**WIDE-ANGLE**  
S O U N D  
by **LINAEUM®**



Optimus PRO X7 with 3x3½" monopole tweeter for 180° sound dispersion, and 5" woofer. 8¾" high.



Optimus PRO LX4 with 3x3½" monopole tweeter for 180° sound dispersion, and 4" woofer. 5¾" high.



**Linaeum True Line-Source Driver™ dipole tweeter.**

**It's a whole new way of listening.**

Exclusively at

**Radio Shack®**

You've got questions. We've got answers.™

important rock artist. But there's a paucity of true songs on his debut album. Is it possible that his record company, in its frenzy to harvest some megadollars A.S.A.P., didn't allow the 25-year-old Buckley time to fully develop his writing?

Grace's first two songs, co-written with New York's favorite-son guitarist Gary Lucas, show the greatest musicality in a way that recalls Robert Plant and Morrissey. Everything else demonstrates that Buckley needs to bond with a musical equal—a producer and/or player—who can balance his over-the-edge vocals with a strong guitar presence. When he can put that together, he will live up to the

hype. Until that time, Buckley stands as merely talented.

Oh yeah, his father was Tim Buckley.  
*Jon & Sally Tiven*

### The Music of Bill Monroe from 1936 to 1994

*Bill Monroe*

MCA MCAD4-11048, four CDs, 4:20:30

Sound: B+, Presentation: A

Bill Monroe is widely credited with creating bluegrass music and forwarding the genre with his Blue Grass Boys. And MCA has done

right by him with this four-disc retrospective. Among the 98 selections are some previously



unreleased tracks, including a transcription of his debut at the Grand Ole Opry. This music forms a bedrock for bluegrass, in both sound development and song selection. Personnel over the years is a virtual who's who of the genre. The set is nicely packaged

in a book-like binding, and the gorgeous 96-page booklet offers a biographical essay by John W. Rumble (which gives great insight into the mule-headed Monroe's illustrious, rollercoaster career) plus lots of photographs and tributes by other artists. *Michael Tearson*

## Discover Boxless Theater!

# VANDERSTEEN AUDIO



"Superior on both film and music, VANDERSTEEN's full-range speakers dispel the myth that video requires unique main speakers."

Model 3  
High resolution, phase correct loudspeaker

*In its pursuit of perfection, high-end audio has established lofty standards that only the best speakers can reach. Now your family entertainment system can meet these same standards. Experience open natural voices, astonishing definition, powerful bass and vivid imaging with legendary VANDERSTEEN boxless speakers.*

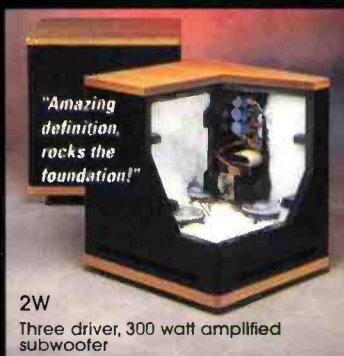


VCC-1  
Phase correct center speaker

**For almost 20 years, VANDERSTEEN AUDIO has built affordable loudspeakers true to both science and music. If you are looking for speakers that accurately reproduce the entire frequency range and dimensions of the original sound, we can direct you to your nearest carefully selected VANDERSTEEN dealer.**

**Please write or call for a brochure and name of your nearest dealer.**

VANDERSTEEN AUDIO™  
116 West Fourth St, Hanford, CA 93230  
(209) 582-0324



2W  
Three driver, 300 watt amplified subwoofer

**Models available from \$495.**

**DIMENSIONAL PURITY.**

### Snivilization *Orbital*

FFRR 697 124 027-2, 75:12

Sound: A, Performance: B+

In a genre dominated by static grooves and monochromatic melodies, *Orbital* is a crazed pinball game, ricocheting infectious rhythms off the sides of your head while providing hooks that are too often lacking in electronic music. With a title like *Snivilization*, *Orbital*'s latest album has the ring of hip cynicism—but it's actually a celebration, full of heavy, earthshaking grooves but married to rapid-fire melodic bursts. Unlike so many other ambient and techno artists who revel in a "name-that-sample" mentality, with *Orbital* you don't really care. They're too busy creating music to worry about insider genuflections. And while many techno artists give lip service to mind-bending tone poems and body-crushing grooves, *Orbital*'s whiplash orchestrations work a full head-and-body experience. *John Diliberto*

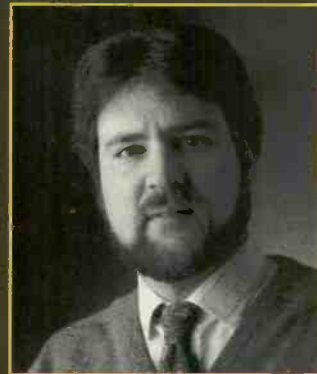


### Faithfull: A Collection of Her Best Recordings *Marianne Faithfull*

ISLAND 314-524 004-2, 49:06

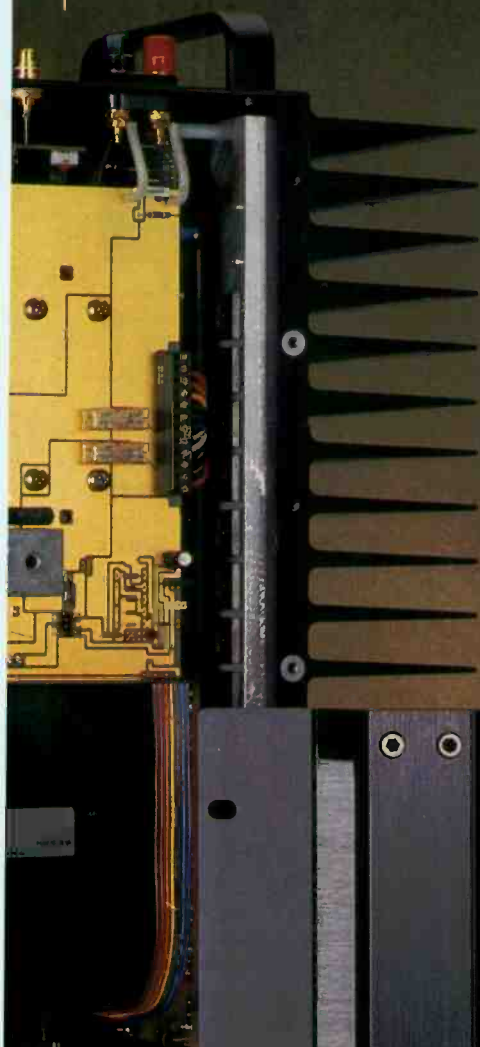
Sound: A, Presentation: B

*A Collection* screams "sampler"—11 tracks, 49 minutes, marking its arrival at a retrospective time in Marianne Faithfull's career and life when a real-deal compendium (read: box set) would perfectly coincide with her new



"I endeavor to create in each and every Coda product, maximum linearity during transient conditions while maintaining a minimalist design approach. This design philosophy provides for an accurate and emotionally involving portrayal of the original musical event. I believe my goal has been realized."

*Eric Fendler*



**CODA**  
TECHNOLOGIES, INC.

**THE CONTINUUM GROUP**

9941 Horn Road Suite A  
Sacramento, CA 95827  
Phone: (916) 363-6653  
Fax: (916) 363-4627

autobiography. Instead, we get something bearing semblance to a promotional teaser.

But while Marianne Faithfull unquestionably deserves something grander, there's no denying the potency of the brilliant, emotionally depth-charged songs that are included here. From the virginal chanteuse to the triumphant sex/drugs/rock 'n' roll survivor, she has lived hard enough to stamp songs—regardless of who wrote them—with an imprimatur of innocence gone corrupt.



Including "As Tears Go By" (her 1964 debut single, the first song ever written by Jagger/Richards) at album's end makes for a haunting footnote to songs defined by Faithfull's ravaged voice. And with its English choirgirl purity, "As Tears Go By" starkly contrasts with the autobiographical and rough-hewn, naked emotion that marks her later work, particularly "Guilt" and "Broken English." But in its own very incomplete way, *A Collection* says something about life, particularly Marianne's. And for so many, Faithfull is life. She's also survival and human spirit in the face of adversity. Now where's that boxed set? *Mike Bieber*

### Cover Girl

Shawn Colvin

COLUMBIA CK 57875, 44:36

Sound: B+, Performance: A

Amid a recent slew of cover albums, Shawn Colvin's stands out as especially personal. Most of her choices are relatively obscure, but even one as familiar as The Police's "Every Little Thing She Does Is Magic" is transformed into something with unexpected twists. The art of covering songs lies in taking the material somewhere it hasn't been before—not merely in reciting by rote—and this is Colvin's greatest strength on *Cover Girl*.

It's a somewhat schizophrenic album, half live and half studio. I especially like the live tracks, where Colvin's spontaneity flies free; you feel she never quite sings a song the same way twice. In the studio, the goal is a perfect take—a goal that can embalm a performance.

Colvin acknowledges the dichotomy in her album notes. The split adds a crucial tension and dynamic to the album, and her song-by-song liner notes add resonance.

*Michael Tearson*



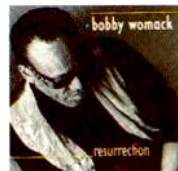
### Resurrection

Bobby Womack

CONTINUUM COND-19401, 64:17

Sound: A-, Performance: B+

When it comes to making records, Bobby Womack can break all the rules and get away with anything. He can sing a square Neil Diamond song and make it groove, he is a peerless guitarist, and he finds it next to impossible to make a wrong move. That said, *Resurrection* features too little of his guitar, and some songs travel a little too close to MOR for Womack's own good. But gems like "Cousin Henry," "Walkin' on the Wild Side," and John Fogerty's "Centerfield" stand toe to toe with the best of Womack's more recent work. Though it's nice to surround oneself with big rock stars, the participation of Ronnie Wood, Keith Richards, Rod Stewart, Ron Isley, and Charlie Watts is barely noticeable considering Womack's undeniable presence. Perhaps *Resurrection* will spur a restoration of public interest in one of America's greatest natural musical treasures. And maybe, just maybe, his record company will let him make that gospel album he's promised to do. *Jon & Sally Tiven*



# NEW WEST

## Electronics

a division of Clarity Electronics LTD • 4120 Meridian • Bellingham, WA 98226

## AMERICA'S TOTAL ELECTRONICS SOURCE

### FEATURING

- INFINITY • SONY •
- PIONEER • SHARP •
- RCA • GO-VIDEO •
- CARVER • B & K •
- FOSGATE • AIWA •
- HITACHI • JBL •
- TOSHIBA • HK •
- JVC • ADVENT •
- CERWIN VEGA •
- DESIGN ACOUSTICS •
- MONSTER CABLE •

AND SEVERAL LINES THAT CAN'T  
BE NAMED IN PRINT!



### SPECIALIZING IN

- A/V RECEIVERS •
- AMPLIFIERS •
- LD PLAYERS •
- CD PLAYERS •
- SPEAKERS •
- PROCESSORS •
- TV • PTV • VCR •
- AUDIO SEPERATES •
- CAR AUDIO •
- ACCESSORIES •

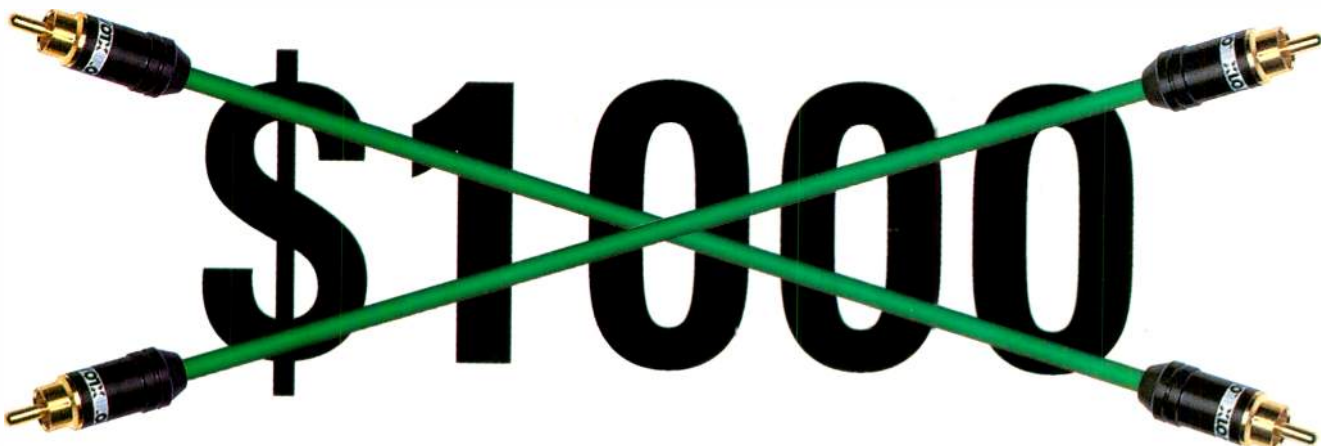
•  
**FREE  
SHIPPING**

•  
**HONEST  
PRICING**

•  
**FRIENDLY  
SERVICE**

MON-FRI 6:30A to 6:30P • SAT 7:00A to 6:00P • SUN 8:00A to 5:00P

# 800-488-8877



**Yours now for just \$49.95!**

It's true! The new XLO/PRO Type 150 interconnect, at just \$49.95 for a one meter pair, really *CAN* ADD \$1000 OR MORE worth of better highs, cleaner bass, higher resolution, tighter focus, and broader, deeper, *vaster* soundstage to virtually ANY system.

Try it yourself. Put XLO/PRO 150 up against ANYTHING AT ALL—from "peanut butter and jelly," up to "the high-priced spread." The only cables you'll find that are any better are XLO's own higher priced models.

XLO really *IS* "The Best in the World!"

Visit your authorized  
XLO/PRO dealer today!

**XLO/PRO**

9480 Utica Street, Suite 612  
Rancho Cucamonga, CA 91730  
Phone (909) 466-0382  
FAX (909) 466-3662

**29 cents FREE!**

Mail in this completed coupon, and we'll send you our latest XLO/PRO literature and a GENUINE U.S. GOVERNMENT 29 CENT STAMP!

Name \_\_\_\_\_

Address \_\_\_\_\_

Telephone \_\_\_\_\_

Only one coupon may be redeemed per customer. Offer is not valid outside the continental United States, and expires December 31, 1994.

# SanusSystems

## Give Your Music a Sound Foundation®



### Performance with Style

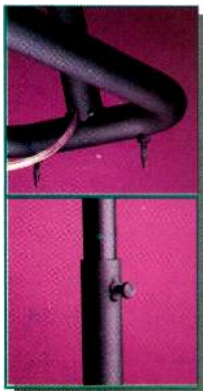
Are you getting the most out of your speakers? Did you know that proper mounting and room placement dramatically improves sound quality? Most major speaker manufacturers recommend loudspeaker supports for optimum performance; many of the best known brands specifically recommend or use Sanus Sound Foundations. Demand the most from your audio dollar. Give your music a Sound Foundation!



Most leading satellite speakers securely bolt mount to Euro Sats. Sanus Systems is not affiliated with speaker brands that are shown.

### Euro Foundations®

Euro Foundations are a contemporary alternative to the utilitarian look of most steel loudspeaker supports. Performance is on par with the finest European and domestic designs, yet the price is affordable. The new generation of satellite and surround speakers bolt mount to Euro Sats for better performance and safety. (Many competing stands use two sided tape!) Euro Foundations feature sand fillable steel bases, adjustable floor spikes, neoprene isolation pads, and a hidden wire path.



All Euro Foundations feature adjustable floor spikes to ensure stability on carpeted surfaces. A concealed speaker cable path keeps wire neat and organized.

The Euro Sat features a unique adjustment knob that allows speaker height and angle to be varied to perfectly match the requirements of your listening room.



Euro Sixteen

Euro Twenty Four

Euro Sat

1973 W. Cty. Rd. C2 Roseville MN 55113 (800) 359-5520 (612) 636-0367 FAX

Enter No. 39 on Reader Service Card



# 11 TRACKS of WHACK

Walter Becker

GIANT 9 24579-2, 56:41

Sound: A+, Performance: B+

Cryptic, clever lyrics and crisp grooves mark the solo debut of Walter Becker. But what else would you expect from one-half of Steely Dan, the enigmatic popmeisters who taught the world to slick.

In song after song, Becker tosses off deliciously snide lines like "your legendary smile is wearing thin" and "sometimes I wonder . . . you do too . . . if I could do it all over/Would I do it all over you" in a voice that is eminently earthier than that of his Steely Dan partner, Donald Fagen, co-producer of this project. The intelligent, free-flowing verse falls somewhere between Rickie Lee Jones and James Joyce, as Becker plies vivid insights about 40-something angst with a keen eye for detail. On the Dan-ish "Girlfriend," he is "strand-



ed between Green Acres of my good intentions and The Twilight Zone of zero self-control." On "This Moody Bastard," he needs "some kind of friend now and again." On the confessional "My Waterloo," he talks about kicking the gong around (a

'30s phrase, popularized by Cab Calloway, for snorting cocaine). Not quite as hip as Tom Waits though not nearly as prosaic as Bruce Springsteen.

"Cringemaker" is a subdued J. J. Cale-ish rocker about marital strife, on which Becker reflects, "Whatever happened to my college girl?/When did she turn into the wife from hell?" His vocals are delivered with David Byrne-type tension, and his economical guitar solo here (another Cale trait) is a biting three-note masterpiece that really hits the mark.

Musically, Becker has the magic touch. His *Whack* is looser and more passionate than the pristine perfection of *Aja* and *Gaucho*, gutsier than the "yuptones" of Fagen's *The Nightfly* and *Kamakiriad*. Nothing Steely Dan or Fagen has ever done slams as hard as "Surf and/or Die" or "Lucky Henry," both of which feature members of Lost Tribe (a group that Becker produced for its recent High Street/Windham Hill release). And in the great Dan tradition, the thing is chock-full of hooks ("Junkie Girl," "Down in the Bottom," "Hard Up Case," "Book of Liars"). A major triumph.

Bill Milkowski

Photograph: Anna Lisa

Since 1955, this man (holder of 5 patents),  
has quietly been revolutionizing  
loudspeaker design.



*Bill Hecht, a true  
audio pioneer.*

**PHASE**  
TECHNOLOGY

*Critically-acclaimed performance and value in premier loudspeaker systems.*

For more information call or write: 6400 Youngerman Circle • Jacksonville, FL 32244 • 904-777-0700 • Fax 904-771-7793

Enter No. 33 on Reader Service Card

# JAZZ ~ BLUES

## RECORDINGS



# GHANIA SANDERS



**The Trance of Seven Colors**  
*Maleem Mahmoud Ghania*  
*with Pharoah Sanders*  
 AXIOM 314-524 047-2, 71:14  
 Sound: B, Performance: B

**P**haroah Sanders' music has always been inextricably linked to Africa. But unlike others' attempts to jazz up African music or use its elements to spice up jazz, he plays within the essential forms, creating a synergy. Teaming up with some Gnawan musicians from Morocco is a logical step for the protean saxophonist, whose music has always possessed a spiritual bent. For the Gnawan people, music is performed as part of a trance-in-

ducing spiritual ceremony led by a *Maleem* (or master).

*The Trance of Seven Colors* is mostly a collaboration between Sanders and Maleem Mahmoud Ghania, who plays the guimbri—a stringed instrument reminiscent of sound of an oud, and sounding like it comes from the bottom of the earth. Ghania lays out trancy ostinato bass, often accompanied by clapping and vocals from his 11-person ensemble, that lets Sanders and his tenor sax wail freely. Sanders rips squalling wails and dark introspective blues on “La Allah Dayim Moulenah,” crying out against chanting singers and Ghania’s bass drone.

There are some straight-on Gnawan pieces featuring the spiritual calls of Ghania’s voice. And on one track, “Peace in Essaouira,” Sanders shows a more soulful side as he blows a poignant soliloquy for his late friend, wildman guitarist Sonny Sharrock. His only accompaniment is the sound of distant shakers.

It’s often difficult for collaborations like *The Trance of Seven Colors* to work, and here, Sanders occasionally sounds like he’s ripping open improvisational spaces where they don’t exist. This is most apparent on “Hamdouchi,” where Ghania’s group is replaced by the whining double reed ghaitas and percussion of Hamadcha of Essaouira, an ensemble that I suspect is made up of Joujouka players, not Gnawans.

On *The Trance of Seven Colors*, Pharoah Sanders has given up his own sound to the powerful music of Maleem Mahmoud Ghania and his Gnawan musicians, but there’s no holding back his own passion.

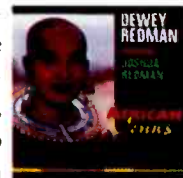
*John Diliberto*

### African Venus

*Dewey Redman*

EVIDENCE ECD 22093, 52:36  
 Sound: A–, Performance: B

In making a splash recently, the young tenorist Joshua Redman mined deep into a tradition honed by so many greats, among them his dad, Dewey. The elder Redman—who burst onto the scene himself some 30 years earlier—reaches back to a more distant ancestry. He begins this album with a long, writhing solo performed on musette (an oboe-like African instrument) to call forth spirits that predate be-bop yet have always influenced his music. That Dewey has Joshua in tow for this session is, of course, no accident. And it’s precisely the contrast between the two able horns—Joshua attacking the beat,



Photographs: Bill Laswell

# ULTRADISC II™

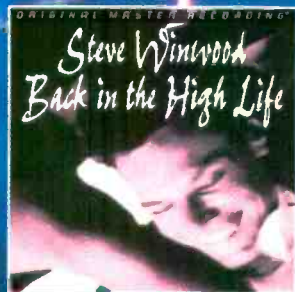
The GAIN System



UDCD 609



UDCD E10



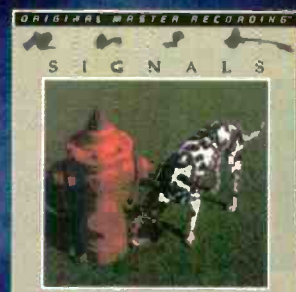
UDCD 611



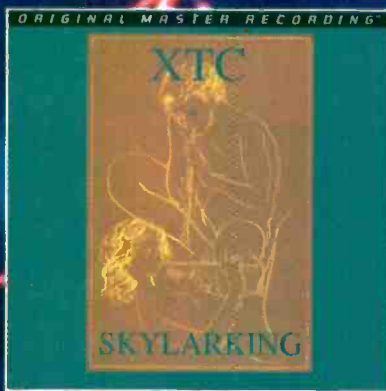
UDCD 612



UDCD 613



UDCD E14



**NEW RELEASE UDCD 615**  
English alternative pop-rockers address coming-of-age issues in this 1986 release, often considered their strongest. Produced by Todd Rundgren.



**NEW RELEASE UDCD 616**  
British blues bandleader John Mayall leads Clapton in a series of classic blues standards to create one of the seminal blues albums of the '60s.



**NEW RELEASE UDCD 617**  
The third title on Ultradisc II™ by seminal Southern rockers, The Allman Brothers Band, this 1973 release includes Top 10 single, RAMBLIN' MAN.

## NATURE'S ENCORE

Mobile Fidelity Sound Lab is dedicated to making music sound its absolute best. Our proprietary mastering techniques advance one step further with the cutting-edge technology of the GAIN System™. We work from original master tapes—with strict attention to detail—because we love the music as much as you do. Hear the difference with Ultradisc II™. The original limited edition, 24-karat gold audiophile CD.

Available at:



For a free color catalog, call 800-423-5759  
e-mail: [mofi@mofi.com](mailto:mofi@mofi.com)  
Internet resource center in CNN. Use WWWMosair to access.

## Folk Singer

Muddy Waters

MOBILE FIDELITY UDCD 593, 40:36

Recorded in 1963, *Folk Singer* stood out because of its immediacy, and it still does. Four of the original album's nine cuts are duets between Muddy Waters and the young Buddy Guy. On four more, the Willie Dixon/Clifton James rhythm section augments the duo, and on the ninth cut Muddy plays alone. These performances are prime Muddy, which is to say as good as blues gets.

And Mobile Fidelity's UltradiscII reissue is fabulous, as the label's new GAIN mastering system, allowing for increased ambience, really makes the music feel like it's live. The addition of two excellent bonus tracks only enhances a killer of an album.

Michael Tearson

ORIGINAL MASTER RECORDING



Dewey hanging back and toying with the rhythm—that fascinates most. Although a wistful vocal on “Mr. Sandman” and a spoken-in-tongues passage in “African Venus” may actually be tongue in cheek, there can be no doubt that on tenor, alto, or musette, Dewey Redman remains a voice of authority and style.

Larry Blumenfeld

### Ancient Ritual

Sonny Simmons

QWEST/REPRISE 45623-2, 69:14

Sound: B+, Performance: A-

Sonny Simmons is a name lost in the mist of the '60s avant-garde, but for a time the alto saxophonist was playing alongside Ornette Coleman (and, like Ornette, releasing improvisationally frenzied albums on ESP-Disk and Contemporary) as well as with Prince Lasha and Eric Dolphy. At the same time, Simmons was forging his own path along the free-jazz thruway, marked by a keen sense of intuitive ensemble playing.

Now Simmons has returned after two decades of obscurity with a new album on Qwest/Reprise, of all places. In the interim, he has clearly honed his sound to diamond precision. His improvisations are melodic in circumnavigating the vortex rhythms churned out by bassist Charnett Moffett and drummer

Zarak Simmons. (Zarak is Simmons' son—another parallel with Ornette).

Simmons always took a metaphysical approach to jazz, and on *Ancient Ritual* he has tuned these young players into a more archetypal sound than what they may have picked up with one of their former bosses, Wynton Marsalis. This music goes directly to the roots. At age 61, Sonny Simmons hasn't mellowed; he's just refined. It makes you wonder what we've been missing all these years.



John Diliberto

### Jungle Music

Black/Note

COLUMBIA CK 57825-2, 68:54

Sound: A, Performance: B+

Before West Coast jazz gained its arguably bad rep of being soft, subdued, and cerebral, a more aggressive genre was swinging on L.A.'s Central Avenue. Saxophonists Sonny Criss, Wardell Gray, and Dexter Gordon engaged in cutting sessions where, after hours of hard-core blowing, the last horn man on stage was declared the winner. Such was black California jazz, and after decades of neglect, a spicy quintet called Black/Note has helped revitalize it.

## the ultimate surround sound

Life is stressful. You could spend a few thousand dollars rushing to a weekend getaway at a rejuvenating retreat. You could mortgage your home for one of those “quiet as a recording studio” motor cars you've seen on television. Or you can keep the family fortune and relax in the sanctity of your own home with a pair of Sennheiser headphones. Discover the ultimate in surround sound... at a budget you can easily afford.

HD 55  
HD 35

HD 440 II  
HD 435

HD 340  
HD 320

HD 250 II  
HD 25 SP

HD 520 II  
HD 540 II  
HD 560 II

HD 580

HE 60  
HEV 70

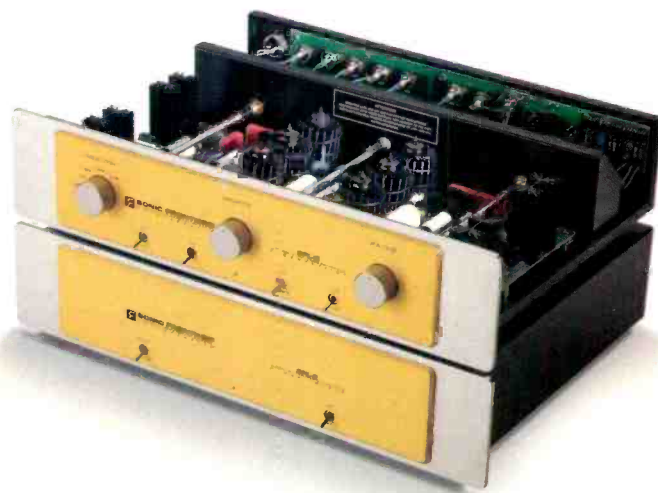
ORPHEUS

SENNHEISER

Enter No. 40 on Reader Service Card

6 VISTA DRIVE, P.O. BOX 987, OLD LYME, CT 06371 · TEL: 203.434.9190 FAX: 203.434.1759  
IN CANADA: 221 LABROSSE AVE, POINTE-CLAIRE, PQ H9R 1A3 · TEL: 514.426.3013 FAX: 514.426.2979

THE SIMILARITIES END HERE.



"[the SFL-2 Preamp] represents a genuine advancement in preamp design."

Russ Novak  
Stereophile, Vol. 17 No. 11, November 1994

Tube Linestage Preamp Comparison Chart\*

Features	SONIC FRONTIERS SFL-2	conrad-johnson Premier 10	Audio Research LS-5	Jadis JPL
Detachable Power Cord	yes	no	no	no
Discrete Attenuation (Volume)	yes (4 positions)	yes (3)	no (cond. plastic pot)	no (cond. plastic pot)
Balanced Circuitry	yes	no	no	no
Single-Ended Circuitry	yes	no	no	no
All Tube Signal Processing	yes	yes	yes	yes
Direct Input Mode	yes (balanced & single ended)	no	no	no
2 Chassis Design	yes	no	no	no
Dual Mono Construction	yes	no	no (stereo power supply)	no
*Record Off* Feature	yes	no	no	no
Switchable Phase Reversal	no	no	no	no
Zero Loop Feedback (global)	yes	yes	no	no
Turn On Mute	yes	yes	no	yes
Standby Mode	yes	no	no	no
Soft Turn-On Power Supplies	yes	no	no	no
Film Capacitor B+ Supply (no electrolytics)	yes	yes	no	no
MIL Capacitors	yes (22 pcs)	no	no (1 pcs)	no
Wishy, Caddock and/or Hoto Resistors	no	yes (17 pcs)	no (Resistor)	no
Discrete Power Supply Regulation	yes	no	no	yes
Low Feedback Regulation	yes	yes	no	no
Signal Switching (min. length)	yes	yes	no	no
Non-Plated PCB Traces	yes	no	no	no
Signal Path Capacitors (fewer are better)	per use	1 per channel	1 per channel	3 per channel
Number and Type of Outputs	(4 cond.) (2 bal.) (2 S/P) (1 tape)	2 (1 main, 1 tape)	3 (2 main (bal.), 1 tape (bal))	3
Tube Life Extension Apparatus	(1 tube radiator)	no	no	no
Weight (net, unboxed)	55 lbs (25 kg)	28 lbs (12.7 kg)	19 lbs (8.6 kg)	29 lbs (13.2 kg)
Warranty	3 year, P&L, ear on. es	3 year, P&L /90 day on tubes	3 year, P&L /90 day on tubes	3 year, P&L
Suggested List Price	\$3,795	\$3,495	\$4,995	\$5,395

\*The information contained in this chart has been sourced from manufacturer brochures, reviews and physical examinations. It is accurate to the best of our knowledge. Sonic Frontiers, Inc. makes no warranty, either expressed or implied, as to the accuracy of this chart. Manufacturer specifications are subject to change. Contact them directly to confirm.

Following the world-wide critical acclaim received by the SFL-1, we at Sonic Frontiers challenged our design engineers to develop the ultimate linestage preamp - a unit that would be generations ahead of the competition. The result of years of intense research and development is the Sonic Frontiers SFL-2 Linestage Preamp.

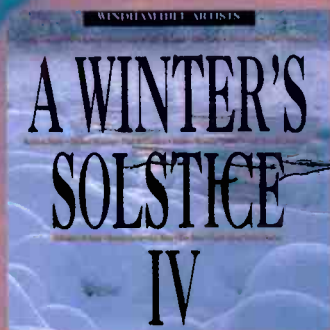
Starting at the detachable power cord - the exceptional quality of the SFL-2 begins to be revealed. Look further inside the SFL-2 and compare it to the competition. From its superior technical performance, comprehensive set of features, skilled hand craftsmanship, unprecedented parts quality and exceptional value - the SFL-2 is the new reference standard for linestage preamps. It is the cornerstone for the ultimate in sound systems.

To learn more about the SFL-2, or any other Sonic Frontiers' product - call, write or fax and we'll be glad to answer any of your questions and to send you detailed product brochures. The Sonic Frontiers SFL-2 Linestage Preamp - light years ahead of the competition.



BREAKING THE SOUND BARRIER

# W. Winter D. Discoveries



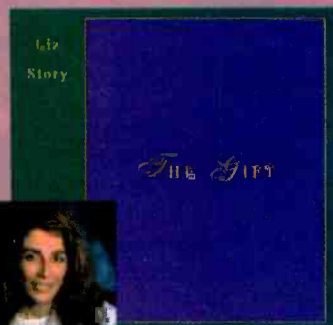
The perfect soundtrack for the holiday season, *A Winter's Solstice IV* features a wide array of instrumentation and musical moods. As the

days grow shorter and a new year approaches, *A Winter's Solstice IV* will capture winter's charms. Some of Windham Hill's most popular artists present both original compositions and personal interpretations of the season's most beloved music.

Of all the arts, none is more characteristic of the divine than music. This special collection of music is inspired by the peace, beauty and allure of angels. The soundtrack companion to the acclaimed PBS special, *In Search Of Angels* reaches across centuries of song to present a broad palette of music from The



St. Olaf Choir, Jane Siberry & k.d. lang, Mark Isham, The American Boy-choir, Tim Story, The Choir of Trinity College and many more.

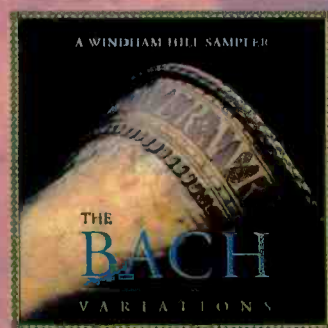


Pianist Liz Story teams up with bassist Joel DiBartolo to present an acoustic collection of Christmas duets. *The Gift*

features a variety of traditional carols, hymns and secular standards of the holiday season. Blending classical and jazz with her own distinctive form of piano improvisation, Liz's latest album is destined to become a perennial favorite.

Of all the composers who ever set quill to parchment, or pen to paper, Johann Sebastian Bach was the ultimate "crossover" artist: his music has

become a universal musical inheritance that continues to inspire musicians of every stripe. This special collection features 14 Bach interpretations by a variety of Windham Hill artists including Nightnoise, Alex de Grassi and Andy Narell.



## From Windham Hill



Available wherever music is sold or order direct 800-495-1976

©1994 Windham Hill Records



Aggression is a key ingredient in Black/Note's success. As the opening track, "No Introduction," surges forward on a blistering up-tempo groove, serpentine horn lines dart elusively in tightly arranged fashion. Drummer Willie Jones III, one of the sharpest players to emerge in quite a while, segues various beats and rhythms effortlessly, catapulting each straight-ahead soloist with a short, whirlwind vamp of Latin. Both trumpeter Gilbert Castellanos and altoist James Mahone exhibit robust styles consumed by pure melody and emotion, never falling prey to the trappings of hard bop cliché.

With a rhythm section that also includes bassist Mark Anthony Shelby and pianist Ark Sano, Black/Note displays concerted sensitivity. Measured restraint equals maturity in this realm, reaping dramatic musical rewards on several passionate ballads. *James Rozzi*

#### The Place To Be

*Benny Green*

BLUE NOTE CDP 8 29268 2 5, 58:52

Sound: A-, Performance: A-

During his five-year history as a recording artist, pianist Benny Green has performed

## CROSSROADS

*Jerry Gonzalez & The Fort Apache Band*

MILESTONE 9225-2, 56:45

Sound: A-, Performance: A

Modern jazz's highly touted "young lions" continue to pursue a standardized vision they can truly call their own. Yet a current trend of melding up-to-the-minute jazz with more traditional Latin styles results in some of the freshest and most expressive sounds available.

The Fort Apache Band has been at this for nearly 15 years. Named after the hometown Bronx neighborhood of founders Jerry and Andy Gonzalez, it has amassed a highly personalized repertoire—a colorful harmonic palette that, while bespeaking a wide knowledge of the history of jazz composition, maintains a fundamental Afro-



Cuban clave that serves as the primal pulse of this music.

Trumpeter Jerry Gonzalez and saxophonists Joe Ford and John Stubblefield are veterans who burn through flashy, imaginative ensemble passages on their way to expressive soloing. Drummer/percussionist Steve Berrios converses playfully with bassist Andy Gonzalez, while pianist

Larry Willis' thoughtful choice of harmonies gives the sextet an unusual buoyancy. Willis paints in subtle watercolors and then contrasts with the more accepted, bold machismo oils.

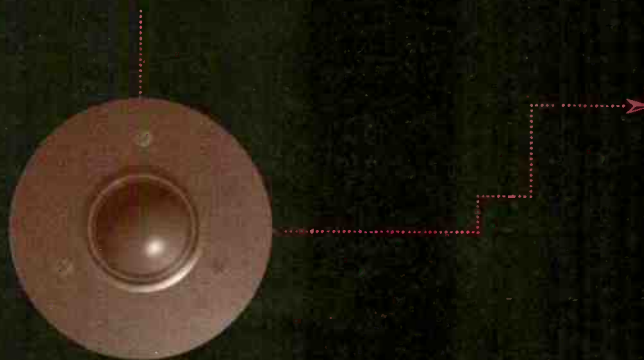
Liberating itself from the tried, true, and ultimately formulaic approach of placing jazz standards over salsa rhythms, The Fort Apache Band stands at the forefront of a creative movement, combining the best of two worlds.

*James Rozzi*

consistently and solidly as both leader and session player. On the cusp of age 30, he now offers an album that is dominated by trio performances (a setup he seems most comfortable with) but that also includes solo and duo material as well as three cuts augmented by a none-too-shabby horn sextet. These sextet tracks show the Bay Area native Green delv-

ing into the most complicated arrangements of his career. He takes a stab at Billy Eckstine's great "I Want To Talk About You," probably knowing full well that the ultimate version belongs to John Coltrane's quartet. The best of the horn selections is Green's own "Nice Pants," the album's swinging, blues-driven opener.

Even if you don't know what a soft dome tweeter is, it's important to know that we invented it.



*Our Patent  
3,328,537 is now  
the industry  
standard.*

**PIIASE  
TECHNOLOGY**

*Critically-acclaimed performance and value in premier loudspeaker systems.*

For more information call or write: 6400 Youngerman Circle • Jacksonville, FL 32244 • 904-777-0700 • Fax: 904-771-7793  
Enter No. 34 on Reader Service Card



Elsewhere, Green applies intelligence and a signature style to other originals and updated covers. He plays solo on "Noreen's Nocturne," written by his hero Oscar Peterson, as well as on Ray Brown's "The Gravy Waltz." The core trio—consisting of Green, bassist Christian McBride, and drummer Kenny Washington—successfully undertakes trumpeter Freddie Hubbard's engaging "One of Another Kind." In all, *The Place To Be* marks another giant step.

Jon W. Poses

### In Love

Jazz Passengers

HIGH STREET 72902 10328-2, 64:41

Sound: A, Performance: B+

Darlings of New York's downtown jazz scene and a regular cult attraction at the Knitting Factory since their 1987 inception, The Jazz Passengers combine music and absurdist humor into a potent blend that either delights or alienates, depending on your allegiance to straight-ahead jazz. On their High Street debut (their first widely distributed CD after several indie releases), the Passengers add vocals to the mix. But on songs written by a co-erite of downtown's finest—including Marc

Ribot, Arto Lindsay, and Passengers co-leader Roy Nathanson—this hardly represents any kind of sell-out, since the choices for guest singers are anything but safe. And often, the combinations are utterly magical.

Little Jimmy Scott, the strangely androgynous torch singer presently in the midst of a comeback, imbues "Imitation of a Kiss" with the kind of deep melancholy that Billie Holiday conjured in "Fine and Mellow." John Kelly lends his eerie falsetto to the hauntingly beautiful ballad "Swim to Me." Deborah Harry turns in a strong performance on the quirky "Dog in Sand." And jazz singer Boborough swings his way through "Ring the Bell." Other vocalists include the great Mavis Staples, Freedy Johnston, Jeff Buckley, and Jenni Muldaur. Passengers drummer E. J. Rodriguez also turns in an affecting vocal performance on his own "Syncretism," which is highlighted by a full-blown santeria-inspired middle section.

These intelligent, well-crafted songs about love, loss, and longing in the age of AIDS are bound to resonate with listeners in search of something more meaningful and provocative than what is currently being offered by the mainstream.

Bill Milkowski



## FAST TRACKS

**Sirens Sweet & Slow:** *Raphé Malik Quintet with Glenn Spearman* (OutSounds/Mapleshade 01972, 66:18). Pianist Malik, who made his name playing with Cecil Taylor, has such a flowing and often song-like approach that even raucous, energetic pieces are approachable. Mapleshade producer Pierre M. Sprey took a liking to the Malik Quintet because their wild exuberance reminded him of an early New Orleans band. And it's that same quality that kept this otherwise more conservative jazz fan listening and enjoying.

J.S.

**Byron Olson's Sketches of Coltrane** (Angel CDC 5 54893 2 3, 73:32). This is the second effort from composer/arranger Olson (following *Sketches of Miles*) to blend the spirit and vitality of jazz with the range and precision of classical music. Here, Olson supports featured saxophonist Joe Lovano with a chamber ensemble, playing Coltrane classics ("Giant Steps," "Naima," "Afro Blue") and originals in a way that seems less forced, more tonal, and more accessible than past Third Stream efforts.

J.S.

<p><b>ortofon</b></p> <p>X5-MC ..... \$175 MC-3 Turbo ..... \$150 MC-1 Turbo ..... \$125 X3-MC / X1-MC ..... \$145 / \$90</p>	<p><b>BENZ MICRO</b></p> <p>Glider / Trade ..... \$750 / \$600 Gold or Silver ..... \$325 Trade-in ..... \$200 MC 20EII ..... \$125</p>	<p><b>sumiko</b></p> <p>BluePoint Special ..... \$220 Blue Point ..... \$ 95 Pearl ..... \$45 Black Pearl ..... \$30 Oyster ..... \$20</p>	<p><b>audioquest</b></p> <p><b>KIMBER KABLE</b></p> <p>Speaker Cables ..... Interconnects ..... Video / Video S ..... Fiber Optics ..... Tonearms / Tonearm Cables ..... AC Power Cord ..... \$49 Installation Cables ..... \$20</p>	<p><b>ortofon PRODISCO</b></p> <p>Concorde Nite S Kit Yellow Tip with extra stylus ..... \$98 Concord Pro Silver with extra stylus ..... \$85 Concorde Pro-Black ..... \$49 OM Pro Black ..... \$39</p>	<p><b>STANTON PRODISCO</b></p> <p>Trackmaster AL-1 including extra stylus ..... \$95 680EL ..... \$39 with extra stylus ..... \$20 500AL ..... \$18 with extra stylus ..... \$13 H4-DJ Headshell ..... \$14</p>
<p><b>T U R N T A B L E S</b> (include free cartridge)</p> <p>KENWOOD KD-291 ..... \$99 DENON DP-7F ..... \$280 DENON DP-23F ..... \$375 DENON DP-47F ..... \$550 SOTA Moonbeam ..... \$379 SOTA Comet ..... \$550 SUMIKO Project 1 ..... \$350 BELTS - Call us with turntable make and model number!</p>	<p>DEEMA Record Clamp ..... \$20 THE PIG Record Grip ..... \$10 EMPIRE Stabilizer ..... \$35 SOTA Reflex Record Clamp ..... \$150 A.R.T. Disc Stabilizer ..... \$330 A.R.T. Q-Damper Disc Mat ..... \$330 SOTA SUPERMAT ..... \$100 Ring Mat 330 ..... \$64 Audioquest Record Mat ..... \$50 Discwasher Felt Mat ..... \$10</p>	<p><b>JPW MINI MONITOR</b></p> <p>An award winning British design with outstanding performance for its modest price ..... \$175 pr.</p>	<p><b>ODDS &amp; ENDS</b></p> <p>Carbon Fiber Brush ..... \$10 Stylus Force Gauge ..... \$14 XLO Test &amp; Burn-in CD ..... \$30 Phono Pre-Amp ..... \$30 Audioquest Big Feet ..... \$50</p>	<p><b>Vestax PDT-5000</b></p> <p>The 1200 Better Look Out! This hot new quick start direct drive features a field replaceable pitch control, lighted pitch meter, detachable cue light and keep your spare change in your pocket because this killer table can be tracked up to 7 grams ..... \$549</p>	<p><b>Stanton/Vestax PMC-005</b> Hot, rugged entry level table top DJ mixer features 2 phono, 4 line level inputs. "Transformer" feature allows play of one channel and push button overbust sound from other channel. ..... \$249</p>
<p><b>discwasher®</b></p> <p>D4 (1.25 oz) fluid ..... \$2.50 D4 (6 oz) fluid ..... \$7.50 D4 (16 oz) fluid ..... \$14.50 D4 Brush System ..... \$17 SC-2 Stylus Brush ..... \$7.50 SC-2 Stylus Fluid ..... \$2.50</p>	<p><b>discwasher® V.R.P RECORD SLEEVES</b></p> <p>VRP Record Sleeves (10) ..... \$7 Mo. Fi. Rice Sleeves (10) ..... \$8 (price in quantities of 50)</p> <p>12" Fitted poly outer ..... \$5 12" Fitted out rauseable ..... \$10 12" Paper / poly inner ..... \$15 12" White paper inner ..... \$12 7" White paper outer ..... \$4 7" Paper / poly outer ..... \$7 7" Poly outer ..... \$3</p>	<p><b>LAST</b></p> <p>POWER CLEANER (1/2 oz) ..... \$24 #2 RECORD PRESERVATIVE (2oz.) ..... \$24 (16 oz.) ..... \$145 #3 RECORD CLEANER ..... \$15 #4 STYLUS (1/4 oz.) ..... \$13 #5 STYLAST (1/4 oz.) ..... \$21 SCRUB BRUSH ..... \$2 STYLUS BRUSH ..... \$2</p>	<p><b>NITTY GRITTY RECORD CARE PRODUCTS</b></p> <p>MODEL 1.0 Manual application of fluid, manual brushing &amp; rotating during vacuuming. .... \$180 MODEL 1.5 Fi Auto fluid application, auto scrub, auto rotation, Vinyl Woodgrain ..... \$360 RECORD MASTER Cleans 45s, 78s &amp; L.P.s manually with built-in adapter which allows cleaning of all size records. .... \$195</p>	<p>Technical Advice &amp; Literature Requests 612-378-0543 TOLLFREE ORDER LINE Fax 612-378-9024</p>	

**JERRY RASKINS NEEDLE DOCTOR**  
419 14th Ave. S.E. • Minneapolis, MN 55414  
Mon-Sat 10-7 Sun 12-5 (C.T.)

800 • 229 • 0644



# YOUR HOME THEATER HEADQUARTERS



SERVICE SELECTION CONVENIENCE

MEADTOWN SHOPPING CENTER • RTE 23 • KINNELON NJ 07405

MAIL ORDER **1-800-542-7283**

FOR INFORMATION & CUSTOMER SERVICE

**201-838-9100**



OVERNIGHT DELIVERY

SE HABLE ESPANOL

WE SHIP TO CANADA

AUD1294



## HEADPHONES

**JVC HAD990 Stereo Headphones**  
 • 24K Gold plated headphone plug  
 • Oxygen free copper wires  
 • Voice coils using clad aluminum wires • Adjustable headband  
 • Soft comfortable ear cushions



REDUCED NOW ONLY **\$79**

**Sony MDRV600** Digital stereo headphones  
**Grado SR60** Rated #1 Stereo headphones  
**Sennheiser HD580** Open air stereo headphones

**\$69 LOW PRICE**

## HOME SPEAKERS

**Acoustic Research M1 Bookshelf Speaker**  
 • 2-Way acoustic suspension  
 • 3/4" Soft fiber dome tweeter  
 • 6" Mica-filled polypropylene cone woofer  
 • 100W power handling



RATED #1 **\$139<sup>pr</sup>**

**Monitor Audio MA100** Reference 2-way bookshelf loudspeaker  
**a/d/s/ Sat 5, Sat 6, Sat 7** High end bookshelf speakers  
**Pinnacle PN2+** 2-Way patented diaduct port bookshelf speaker

## ATLANTIC TECHNOLOGY

**Pattern 100 Powered Satellite/Sub System**  
 • 3-Line, 1 high level input  
 • Rotating dual enclosure satellites  
 • Patented bass countouring circuit  
 • Dual 6 1/2" woofers



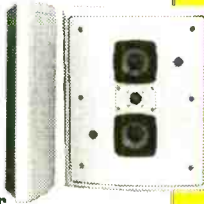
Orig **\$249**  
**\$549**

**150 HT, 250 HT Systems Available**  
**153C, 253C, 153PBM, 253PBM & More!**

## ON WALL SPEAKERS

**Sonance 400 On-Wall Speakers**

• Vented system, vertical Woofer  
 • Tweeter Woofer configuration with central dome tweeter  
 • 1" Sonance soft dome tweeter  
 • Dual 4" polypropylene cone, butyl edge, long throw woofer  
 • 5-90W power handling  
 • White cloth or metal grilles



ORIG. \$500 **\$199<sup>pr</sup>**  
 NOW ONLY

## SPECIAL PURCHASE

**Sharp VCH98U VHS VCR**

• 19 Micron, 8 head video system  
 • Universal remote w/jog shuttle  
 • VHS Hi-Fi stereo sound and MTS  
 • Variable skip search



ORIG. \$449  
**\$299**

**JVC HRVP606U** Remote control VHS VCR VCRPLUS+  
**Panasonic PV4461** Hi-Fi MTS VCRPLUS+ hd clearer  
**JVC HRS4900** S-VHS remote control VCR w/jog shuttle

CALL LOW PRICE

## CAMCORDERS

**Hitachi VME55A 8mm Compact Camcorder**

• 16X F1.4 lens system  
 • 1 Lux minimum illumination  
 • Electronic image stabilizer  
 • Instant zoom  
 • Digital signal processing



RATED #1 **CALL**

**Panasonic PV564, PV54, PV900, PV910** CALL  
**JVC GR57, GRAX37, GRAX70U, GRAX 30** LOW  
**Canon UCS3, UCS5, L2, ES1000, E700, E520** PRICE

## LASER DISC PLAYERS

**Brand Name Laser Disc Player**

• Full function remote control  
 • Clear visual scan  
 • 8-Bit laser disc player



ORIG. \$489 **\$379**

Call For Brands Not Listed

**Panasonic LX600** Auto reverse optical out multi laser disc player  
**Panasonic LX900** Auto reverse play, jog shuttle w/remote control  
**Panasonic LX101** Remote MASH, edit search, S-VHS output

## LIMITED QUANTITIES

**Hughes AK-500 Sound Retriever** ORIG. \$179

The AK-500 also restores dynamics, depth and incredible width to all of your sound. It adds spacious ambience to mono, stereo, or surround-type encoded material. The AK-500 does not require extra amps or rear speakers, and allows you to quickly upgrade your present investment.

**Panamax 1000** Surge protector/line conditioner. Features 8 AC outlets and built-in voltage meter

CALL

**3" to 120" TV's  
 16:9 Projection TV's  
 TV/VCR Combos  
 PAL/SECAM TV's  
 Stewart Screens  
 Front Projectors**

**YOUR STORE FOR THE BEST SELECTION OF COMPONENTS FOR BUILDING THE ULTIMATE HOME THEATER ROOM !**



## PROLOGIC RECEIVERS

**Brand Name Pro Logic Receiver**

• Dolby Pro Logic surround sound  
 • Adj digital time delay • Discrete front amps  
 • 15W/ch for center and rear  
 • 55W/ch for front L/R



ORIG. \$350 **\$259**

**NEW THX RECEIVERS IN STOCK**

## CENTER CHANNEL SPEAKERS

**KEF Concept 90**

• Employs a 6 1/2" Uni-Q driver with a coincident 3/4" tweeter. The Model 90's reflex loaded bass system delivers a solid low end with a fast transient attack. Vertical or horizontal mounting



ORIG. \$380 **\$179**  
 NOW ONLY

**JBL SC305** Dual 5 1/4" drivers & 1/2" dome tweeter CALL \$99  
**Audio Source VS One** Dual 4" drivers w/1" tweeter LOW  
**Canon AV500** Dual 4.5" drivers w/1" dome tweeter PRICE  
**Monitor Audio CC200** Dual 4.5" drivers w/3/4" tweeter

# FACTORY AUTHORIZED

- ADS • Advent • Audio Control • Aiwa • AKG • Altec Lansing • Audio Quest • Acoustic Research • Audio Source • Atlantic Technology
- B&K • B&O • Bazoooka • BBE • Beyercynamics • Bellogetti • Brother • Canon • Carver • Cerwin Vega • Celestion • Cliff Designs • Canton
- Code Alarm • CWD • Denon • Dynamat • Grado • Harler • Harmon/Kardom • Hitachi • Hughes • Infinity • Jamo • JBL • JVC
- K40 • Koss • Lexicon • Monitor Audio • Monster Cable • Niles • OmniMount • Orion • Panasoric • Philips • Pinnacle • Pioneer
- Panamax • PPI • Proscan • PS Audio • Rane • Rockford Fosgate • Runco • Soundcraftsmen • Soundstream • Senheiser • Sherwood
- Sharp • Sony • Sonance • SSI • Stewart • Target • Technics • Terk • Thorens • Triad & More!

Some pictures for illustration only. Not responsible for typographical errors • No refunds on video or car stereo products • 10 Day defective exchange from date of receipt • All returns must be made within 10 days of receipt of merchandise & are subject to a restocking fee • Items must be in original condition and packaging • Standard shipping applies Shipping and handling are not refundable • No tax on out of state purchases • Non-commissioned salesman • Next day and second day delivery available.

Enter No. 43 on Reader Service Card



## This Month's Specials!

### Hi-Fi Video Recorders



**Panasonic PV-4451 Hi-Fi Stereo VHS Recorder**  
 •4 heads •181-channel cable compatible tuner •English/Spanish on-screen display  
 •1-month/8-event programming •Universal remote  
 Our Low Price **\$299<sup>95</sup>** (PAN PV4451)

**Aiwa HV-FX1000** •4 heads, 8-event/1-year programming **\$279<sup>95</sup>**

**JVC HR-VP606** •VHS Hi-Fi, 4-heads, jog/shuttle, remote **\$349<sup>95</sup>**

**Mitsubishi HSU-59** •VHS Hi-Fi, 4-heads, VCR Plus + **\$499<sup>95</sup>**

**Mitsubishi HSU-69** •S-VHS Hi-Fi, 4-heads, VCR Plus + **CALL**

**Sony SLV-770HF** •4-heads, VCR Plus+, auto-station ID **CALL**

### Receivers



**Technics SA-GX170 Audio/Video Receiver**  
 •100 watts per channel •Special class H circuit provides greater headroom •AM/FM tuner with 30 presets •Wireless remote  
 Our Low Price **\$179<sup>95</sup>** (TEC SAGX170)

**Sherwood RX-1010** •35 watts/channel, 30 station presets **\$109<sup>95</sup>**

**Sherwood RX-4030R** •65 watts/channel, matrix surround, remote **\$159<sup>95</sup>**

**Sherwood RV-5030R** •85 watts/ch, Dolby Pro Logic **\$249<sup>95</sup>**

**Technics SA-GX470** •110 watts/channel, surround sound **\$269<sup>95</sup>**

**Technics SA-GX670** •110 watts/channel, matrix surround, remote **\$349<sup>95</sup>**

### Portable CD Players

**Panasonic SL-S170 Portable CD Player**  
 •MASH 1-bit D/A converter  
 •24-track programming  
 •Repeat, search & skip functions  
 •XBS system •8 hour playback on 2 AA batteries (not incl.)  
 •Headphones and AC cord  
 Our Low Price **\$97<sup>00</sup>** (PAN SLS170)

**Sony D-232 Discman with Electronic Shock Protection**  
**RECHARGEABLE**  
 •Mega bass sound system •10 play modes •22-track programming •Stereo headphones & rechargeable battery supplied  
 Our Low Price **\$157<sup>00</sup>** (SON D232)

### Amps/Preamps/Tuners



**Perreux E110 Power Amplifier**  
 •100 watts per channel @ 8 ohm loads/ 160 watts per channel @ 4 ohms with over 200 headroom •MOSFET outputs provide transparency & stability •Black finish  
**\$999<sup>95</sup>** (PUX E110)



**Denon PMA-880R Integrated Amplifier**  
 •75 watts per channel •High-current design increases stability when driving low impedance loads for greater dynamic range with less distortion •Wireless remote control  
**\$299<sup>95</sup>** (DNN PMA880R)

**AudioSource TNR ONE** •Tuner, AM/FM, 20 presets **\$199<sup>95</sup>**

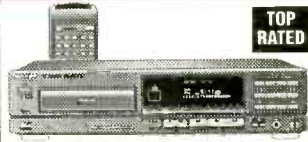
**AudioSource PRE ONE** •Preamplifier, MM/MC phono, tape dub **\$229<sup>95</sup>**

**AudioSource AMP ONE** •Power Amp, 80 watts/channel, bridgeable **\$249<sup>95</sup>**

**Proton AA-2120** •Power Amp, 120 watts/channel **\$629<sup>95</sup>**

**Proton AP-2000** •Preamplifier, MM/MC, subwoofer X over **\$269<sup>95</sup>**

### CD Players/Converter



**Technics SL-PG440 Remote Compact Disc Player**  
 •MASH 1-bit D/A converter •20-track programming •30-key wireless remote control  
 •Edit guide for tuning •Peak level search  
 •Headphone jack with volume control  
**\$139<sup>95</sup>** (TEC SLPG440)



**Teac PD-D880 5 Disc CD Player**  
 •16-bit D/A converters with 8x oversampling  
 •Front-loading design •Fluorescent display  
 •32-track programming •Headphone jack with headphone control •Unified remote control  
**\$149<sup>95</sup>** (TEA PDD880)

**Sherwood CDC-5030R** •5-disc carousel, 32-track prog. remote **\$159<sup>95</sup>**

**Technics SL-PD667** •5-Disc Changer, MASH 1-bit D/A, front-load **\$174<sup>95</sup>**

**Technics SL-PD867** •5-disc Changer, MASH, 32-track prog. remote **\$199<sup>95</sup>**

**Technics SL-PD967** •MASH, 5-disc Changer, pitch control **\$249<sup>95</sup>**

**Fisher DAC-2403** •24-CD Changer, vertical load, remote **CALL**

### Loudspeakers



**Advent Legacy III Two-Way Speakers**  
 •10" dual voice coil woofer •1" ferrofluid cooled parabolic soft dome tweeter •Switchable 8/6 ohm impedance •Floor standing design  
 •100-watts max •Pecan top & base  
 Our Low Price **\$299<sup>95</sup>/pair** (ADV LEGACYIII)

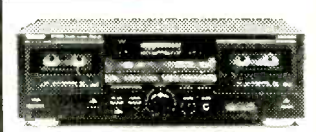
**Bose 101** •Indoor/Outdoor Mini speakers ..... pair **\$149<sup>95</sup>**

**JBL Pro III** •High Performance mini, 2-way, shielded pair **\$149<sup>95</sup>**

**Bose 301-III** •Direct/Reflecting Speakers, 2-way ..... pair **\$318<sup>00</sup>**

**JBL 4312BK** •Professional Studio Monitors, 3-way ..... pair **\$499<sup>95</sup>**

### Double Cassette Decks



**Teac W-800R Dual Auto-Reverse Cassette Deck**  
 •Bi-directional record & play •Dolby B&C  
 •Dolby HX-Pro •Twin electronic tape counters •Microphone inputs •Computomatic Program search  
 Our Low Price **\$199<sup>95</sup>** (TEA W800R)

**JVC TDW-106** •Dolby B, high speed dubbing **\$94<sup>95</sup>**

**Technics RS-TR232** •Deck #2 auto-rev, Dolby B/C/HX-Pro **\$159<sup>95</sup>**

**Sherwood DD-6030C** •Dual auto-rev replay, Dolby B/C/HX-Pro **\$199<sup>95</sup>**

**Technics RS-TR979** •Dual auto-rev, Dolby B/C/HX-Pro, fine bias **\$299<sup>95</sup>**

**Teac W-6000R** •Dual auto-rev, Dolby B/C/HX-Pro, pitch ..... **\$429<sup>95</sup>**

### Personal Stereo

**Panasonic RQ-V200 AM/FM/Cassette Personal Stereo**  
 •AM/FM digital tuner with 28 presets •Auto-reverse cassette with anti-rolling mechanism  
 •Dolby B •XBS bass •Live sound function •Dual clock function •Headphones  
 Our Low Price **\$77<sup>00</sup>** (PAN RQV200)

**Sony WM-FX507 Radio/Auto-Reverse Cassette Walkman**  
 •World wide digital tuner with 7 - A M 77 - F M presets •Feather touch control  
 •Mega Bass with 3-position switch •Dolby B  
 Our Low Price **\$147<sup>00</sup>** (SON WMF507)

### Sennheiser Headphones

**Sennheiser HDC 451 NoiseGard™ Headphones**  
 •Open-air headphones with active noise compensation  
 •Lightweight •Allows listen ng to speech, yet it reduces ambient noise  
 Our Low Price **\$197<sup>00</sup>** (SEN HDC451)

**Sennheiser HD-580 Circumaural Headphones**  
 •Precision headphones deliver ultra-wide flat frequency response  
 •Velvet covered ear cushions provide maximum comfort & excellent isolation without adding weight •10 foot cord  
 Our Low Price **\$297<sup>00</sup>** (SEN HD580)

### Compact Disc



**Theonious Monk Complete Blue Note Recordings**  
**\$44<sup>99</sup>** 4 CD Set Also Available  
**Louis Armstrong: Portrait of the Artist as a Young Man**  
 COL 57176 ..... **\$49.99** 4 CD Set  
 ..... **\$40.99** 4 Cass. Set


**Bud Powell The Complete Bud Powell on Verve**  
 VER 521669 ..... **\$69.99** 5 CD Set

CALL US TOLL FREE FOR ITEMS NOT LISTED IN THIS AD SE HABLA ESPANOL

SEND MONEY ORDER, CERTIFIED OR CASHIER'S CHECK, MASTERCARD, VISA, AMERICAN EXPRESS or DISCOVER CARD (include Interbank No., expiration date and signature) To: J&R Music World, Dept AU1294, 59-50 Queens Midtown Expwy, Maspeth, Queens, New York 11378. Personal and business checks must clear our Authorization Center before processing. Shipping, handling and Insurance Charge (Continental US) is 5% of the total order with a \$4.95 minimum for orders up to \$500, 4% for orders over \$500 to \$1000, and 3% for orders over \$1000. For heavyweight/over-sized items, shipment by air, or to Canada, Hawaii, Alaska, Virgin Islands, and Puerto Rico please call for information. DO NOT SEND CASH. Sorry, no C.O.D.'s. N.Y. residents please add sales tax. ORDERS SUBJECT TO VERIFICATION AND ACCEPTANCE. NOT RESPONSIBLE FOR TYPOGRAPHICAL OR PICTORIAL ERRORS. ALL MERCHANDISE SHIPPED BRAND NEW, FACTORY FRESH AND 100% GUARANTEED.  
 Copyright 1994 J&R Music World, City of N.Y.  
 Dept. of Consumer Affairs License Numbers 0900310/0900615/0900616/0900617

**Call Toll Free To Order 24 Hours A Day 7 Days A Week**  
**1-800-221-8180**  
 To receive our free catalog circle # 19 on Reader's Service Card

**The Ultimate STORAGE CABINET.**



MasterCard  
VISA

**The Cube**  
by Lorentz Design

Stores **306 CD's**  
or any combination  
of CD's, VHS, Cassettes, etc.

•Featuring our patented ALLSTOP STORAGE SYSTEM, no slots, no plastic molds, no wasted space • Full-extension drawer slides • From high quality oak veneers and hardwood • 23" H x 19 1/2" W x 17 1/2" D • Fully assembled • Stackable • Available in Light, Medium, Dark Oil Stain (\$225) & Black (\$235) - Plus shipping and handling.

To order or for free brochure  
**800-933-0403**  
Lorentz Design, Inc. • P.O. Box 277  
209 Parkway Ave. N. • Lanesboro, MN 55949  
FAX 507-467-2468

# CD STORAGE +™



**SORICÉ SYSTEMS Include...**  
Video, Cassette, LP, Laserdisc  
and Component Storage Units.

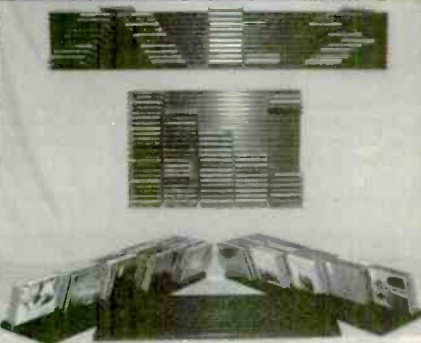
- ❖ Our A300 Model shown stores 300 CD's.
- ❖ Impeccably crafted in these Premium Solid Hardwoods: Oak, Walnut, Teak or Cherry.
- ❖ Adjustable Shelves store any combination of CD's, Videos & Cassettes - all in One cabinet.
- ❖ Adjustable Solid Brass Bookends keep Discs & Tapes upright and in place.
- ❖ Cabinets can be stacked, wall mounted or left free standing.
- ❖ Optional Wood or Glass Doors are available.
- ❖ Enclosed back provides dust protection.
- ❖ Compact size: 39 1/2" H x 23 1/2" W x 7 1/2" D. Cabinet comes assembled.

No. A300 (Shown in Solid Brown Oak)

**SORICÉ**  
PC Box 747-22, Nutley, NJ 07110  
Credit Cards, Checks and Money Orders accepted  
30 Day Money Back Guarantee and a Full One Year Warranty on all Models.

For FREE Color Literature & Prices on our Full Line of Quality Products  
**Call: 1-800-432-8005**  
**Fax: 1-201-667-8688**

## THE RACK CD STORAGE SYSTEM



**UNIQUE MODULAR QUALITY ANODIZED ALUMINUM**

Highly versatile horizontal or vertical storage. All units interlock, unlimited growth.

B-26-2 110 CD'S \$ 89.00+P&H  
B-52-2 220 CD'S \$170.00+P&H

Custom sizes for large applications. Lifetime guarantee, 30 day trial. Made in the U.S.A. Patent pending.

**AUDIO LIBRARY SYSTEMS**  
P.O. Box 112252  
Stamford, CT. 06911-2252  
Fax (203) 961-0618  
Phone (800) 822-5119

Please contact us for more information.

SAY GOODBYE TO VERTICAL TITLES!

Copies of articles from this publication are now available from UMI Article Clearinghouse.

**U·M·I**

A Bell & Howell Company  
300 North Zeeb Road,  
Ann Arbor, MI 48106 USA  
800-521-0600 toll-free  
313-761-4700 collect from Alaska and Michigan  
800-343-5299 toll-free from Canada

## The Archetype Rack Systems™





The Archetype Rack System features the latest in design. The heavy duty shelves are fully adjustable and vibration absorbing. Expandable and modular, the system may be arranged in almost any configuration. Available in several finishes including solid hardwoods. 5 Shelf units from \$199

**Salamander Designs**  
1 Linder Place, Hartford, CT 06106 • Phone 800-535-5659 • Fax 203-247-3456

Made in USA Product Design Copyright © 1993 Salamander Designs. All Rights Reserved Archetype Systems, Trademark Salamander Designs

# BILLY BAGS®

AUDIO/VIDEO SUPPORT  
DESIGN

Our component rack systems are the result of serious attention to detail and pride in the art of design and craftsmanship.

"We will even design a piece to your exact specifications!" Our custom design department is fast and affordable.

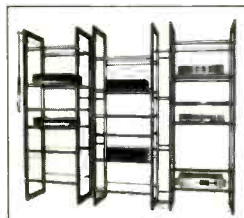
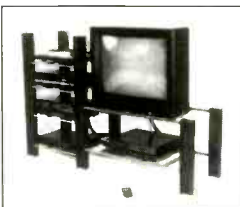


### Audio Racks

#5000 #2300 and others.

Comes in 4 colors to choose from.

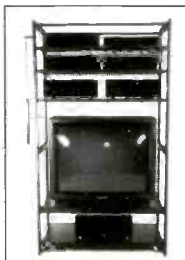
The I-Beam Component Center  
T.V. Swivel Available.



### The Audio Center

1-3 Bays  
Any Height  
Adjustable  
Glass  
Component  
Shelving.

Media-Rax™  
All Sizes  
(adjustable)



### The Eye-So Stack Rack System

Call us today for your local dealer and a copy of our detailed Newsletter with product photos and specifications...

#### We Manufacture:

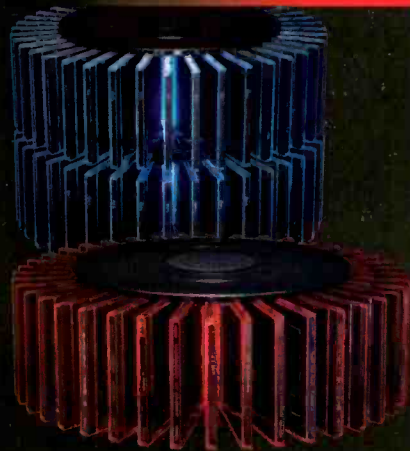
- Audio Racks
- T.V. Recorder Tables
- Amp Stands
- Big Screen Pedestals
- Speaker Stands
- Turn Table Foundations
- CD Storage Racks
- Laser Disc Storage
- Projector Tables
- Monitor Swivels
- Wall Brackets
- Audio Dusters
- Tube Flex Kits
- Custom Designs Available



4147 TRANSPORT ST.  
VENTURA, CA 93003

(805) 644-2185  
FAX 644-0434

## ILLUMINATED CD CAROUSEL



- Colorfully Illuminates Your CD Cases
- Available in Red or Blue
- Can Be Rotated for Easy Selection
- Stack Modules Available for Greater Storage
- Each Module Holds 40 CD's
- Comes Fully Assembled, Just Plug In and Enjoy

Base Module \$29.95 plus S&H  
Stack Module \$19.95

Credit Cards, Checks, and Money Orders Accepted  
Call 1-800-729-1119-Fax (602) 581-2838

**RAX**  
CREATIVE HOLDERS

4410 W. Union Hills Dr.  
Suite 7-130  
Glendale, AZ 85308



Stackable, portable oak units hold all recording formats and audio/video components



### The best disc, tape, component storage system in America

Free mailorder brochure  
(please mention Audio)

Per Madsen Design (415) 928-4509  
P.O. Box 330101, San Francisco, CA 94133



STORADISC™ - See why CD Review picked our Library Series as their "top choice". Fine-furniture quality in a variety of finishes and sizes. Call or write DAVIDSON-WHITEHALL, 555 Whitehall Street, Atlanta, GA 30303. 1-800-848-9811.

## Storage Solutions



### CD, Audio and Video Storage

- » Fully Assembled!
- » 100% Solid Oak!
- » 30 Day Money Back Guarantee!
- » Made in U.S.A.
- » Smoked Glass Doors
- » Adjustable Shelves
- » No Hidden Costs

#### Just One Low Price!

Call or write for a free color brochure

AGM Woodworking  
870 Capitolio Way #5  
San Luis Obispo, CA 93401  
(805) 544-8668

MasterCard **1-800-858-9005** VISA

**CD essentials**

Store - Organize - Open - Clean

**STORE with The Super Shelf™**

Stackable storage system... most efficient & cost-effective available today. Capacity 40 CD's.  
\$12.99 + \$4.50 s/h

**new!**

16 Dividers w/ bendable tabs.  
12 printed (AB-XYZ),  
4 blank; can customize.  
Use with all storage devices. \$5.99 + \$1.00 s/h

**ORGANIZE with DiscPickables™**

Cuts through any new CD packaging. \$2.99 + \$1.50 s/h

**OPEN with EZ-CD™**

16 quality wipes in jewel box dispenser.  
\$3.99 + \$1.50 s/h

**CLEAN with CD Care™**

**SAVE with Essential Collection™**

which includes DiscPickables, EZCD, and CD Care. \$9.99 + \$2.00 s/h (SAVE \$3.00)

**BONUS:** Super Shelf, DiscPickables & Essential Collection each come with The Compact Disc User's Guide, absolutely free.

Send check/m.o. to MacTeel Products  
21416 Velicata St., Woodland Hills, CA 91364 (CA Res. add tax)

VISA

or call us for a free catalog: 1-800-MacTeel. Patents Pending

Millions of your prime prospects can be found in the industry leading titles of *Hachette Filipacchi Magazines, Inc.*

To place a classified ad, simply call Toll-Free and reserve your space today!

**1-800-445-6066** (9am-5pm EST)  
In Canada: 1-212-767-5057

ARIZONA

**HIGH - END !!!**

Specializing in the finest home audio from around the world.

ACOUSTIC RESEARCH, ADCOM, APOGEE, AUDIO POWER INDUSTRIES, AUDIO RESEARCH, CALIFORNIA AUDIO LABS, AUDIOQUEST, CREEK, CWD, DAY SEQUERRA, ENERGY, EPOS, EXPOSURE, FORTE, KRELL, LINN, LEXICON, MAGNUM DYNALAB, MARANTZ, MIRAGE, NAKAMICHI, ROTEL, ROCK SOLID, TARA LABS, THIEL, WADIA AND MORE

*Sounds Like Music*

REAL HI FI SYSTEMS

2734 West Bell Road, #1306  
Phoenix, Arizona 85023  
**602-993-3351**

We want to help you choose the best Hi Fi.

CALIFORNIA

**We don't sell perfect systems.**

After 15 years, we've learned no perfect system exists. It has to be built to your specifications, within your budget. To get started, call us today... and ask us how.

**REFERENCE**  
AUDIOVIDEO  
**ASK US HOW.**

310 517-1700  
310 517-1732 fax

18214 DALTON AVENUE, DEPT A  
GARDENA, CA 90248



CALIFORNIA

**VALUEABLE**

WE COMBINE EXCEPTIONAL PRODUCTS WITH DESIGN EXPERTISE TO CREATE HIGH PERFORMANCE SYSTEMS OF UNUSUAL VALUE.

Factory Authorized Dealer for:

Adcom • Apogee • Audible Illusions  
Audiolab • Atlantic • AudioQuest • Audiostatic  
Celestion • Definitive Technology • Denon  
Fosgate • Grado • Hafler • Hitachi • Lexicon  
Lineum • Mc Cormack • Mod Squad • M&K  
NAD • NEAR • Paradigm • Parasound • Power  
Wedge • Rotel • SOTA • Stax • Sumiko • Theta  
Totem • VAC • Van Den Hul • Velodyne  
Vidikron • XLO & more!

**Systems Design Group**

(310) 370-8575

1310 Kingsdale Ave.  
Redondo Bch., CA 90278  
Tue-Fri 11am-7pm  
Sat 11am-6pm

CALIFORNIA



- FEATURING
- ◆ SONY MINI DISC RECORDER ◆
  - ◆ TECHNICS & PHILIPS DCC ◆
  - ◆ MARANTZ CD RECORDERS ◆
  - ◆ SONY MICRO DAT RECORDER ◆
  - ◆ DIGITAL AUDIO TAPE RECORDERS ◆

SALES • RENTALS • REPAIRS • DUPLICATIONS • TRANSFERS

Any Combo • DAT • CD • DCC • MiniDisc  
4mm Data Cartridge & Blank DAT Tape (2.0 Gig. 3 hour available)  
Accessories & Blank Media for all Recorders

WE DO MAIL ORDER - WE'll SHIP ANYWHERE!  
VISA • MASTERCARD • AMERICAN EXPRESS • DISCOVER • C.O.D. • SHIP U.S. • FED-EX  
Mondays - Fridays: 9:00am - 6:00pm • Saturdays: 1:00 - 4:00 • Closed Sundays

The DAT Store 7674 Wilshire Boulevard • Santa Monica, CA 90403  
Tel No. 310-828-8757 • Phone No. 310-828-6487

CALIFORNIA

**WE'RE HERE**

Now you can shop with confidence at one of the USA's largest dedicated Home Theater Sales Centers! From basic surround to full blown THX sound, we do it all!



6 SHOW ROOMS

AUTHORIZED DEALER:

- Acurus • AMC • Aragon • Marantz • Alon • Jamo • Counterpoint • Magnum • B&K • Coda • PSB • Energy • Veritas • PS Audio • Fosgate • JBL Synthesis • Proton • Carver • EAD • Audio Alchemy • Stax • Klipsch • Kimber • Grado • Celestion.

CALL TOLL-FREE! 1-800-405-HIFI OPEN 7 DAYS

**Definition**  
AUDIO VIDEO

2901 West 182nd St.  
Redondo Beach  
California 90278  
CALL (310) 371-0019

FLORIDA

**FACTORY DIRECT HOME THEATER SPEAKERS**



*Check Your Woofers!*

- Speaker Refoaming
- Factory Parts
- 2-day Turnaround
- Upgrades - Modifications
- Speaker Parts and Kits
- Wire and Cable
- Stands and Brackets



**(813)544-3511**

MON-SAT 10-6 E.S.T.

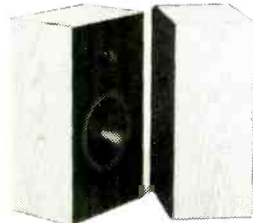
ILLINOIS



**When Nothing But The Best Will Do!**

**SNELL'S K/IV**

Hand Tuned for a Remarkable Performance Standard.  
Compact Two-Way Bookshelf Design.  
Now at MusiCraft.



- SONY ES
- MARANTZ
- CARVER
- NAD
- SNELL
- JBL-THX
- ONKYO
- PIONEER
- KENWOOD
- VELODYNE

**MusiCraft** AUTHORIZED HOME THEATER

PALATINE 1280 E. Dundee Rd. (708) 991-7220  
HOMewood 18100 S. Halsted (708) 799-2400

ILLINOIS

**Reel to Real Designs**



New FOCUS Speaker

Authorized Dealer:

- CODA
- Counterpoint
- Cary
- Sumo
- Soundcraftsmen
- Thorens
- Parasound
- Fosgate
- Simply Physics
- Sumiko
- Quicksilver
- Room Tunes

**800-283-4644**  
call for literature

Visit our **SPEAKER FACTORY SHOWROOM**  
at 3021 Sangamon Ave., Springfield, IL 62702

MAINE

- Acurus ... AMC ... Aragon ... Audioquest
- ... Audio Research ... Bryston ... Creek
- ... CWD ... Dahlquist ... Denon ...
- Genesis ... Grado ... Jamo ... Lexicon ...
- Magneplanner ... Magnum Dynalab ... Mark Levinson ... NAD ... Near ... Prometheans
- ... PSB ... Pulsar ... Revolver ... Rotel ...
- SME ... Sota ... Sound Connections ...
- Stax ... Stewart ... Sumiko ... Sumo ...
- Symdex ... Thoren ... Transparent Audio
- ... VPI ... And Much More!

**Hi Fi Exchange**

FORESIDE MALL • ROUTE ONE  
FALMOUTH, ME 04105

**(207) 781-2326**

MASSACHUSETTS

**OK!** SO WE'RE  
A NAME  
DROPPER!

Authorized Dealers For...

**JVC** **Panasonic**  
**MITSUBISHI** **Canon**  
International Corporation  
ELECTRONICS  
**BOSE** **SONY**

**Plivell** WALL BRACKETS  
(Sorry No Catalogs)  
**BEACH SALES** 80 VFW Parkway  
Beverly, MA 02151  
In Business for 50 Years  
**1-800-562-9020**

NEW JERSEY

NEW JERSEY

**D**irect  
**A**udio  
**V**ideo  
**E**ntertainment  
**S**ystems

**SPEAKERS**  
Bose, Advent, B&W, Boston,  
Polk, Atlantic Technology, PSB, M&K,  
Pinnacle, Infinity, JBL

**ELECTRONICS**  
Nad, Adcom, Onkyo, Pioneer,  
Rotel, Carver, Nakamichi, HK, Kenwood  
FOR PRICE SERVICE SELECTION CALL  
**1.800.308.0354 In NJ NY Call 201.997.7812**  
MON-FRI 10AM-8PM SAT 10AM-5PM  
**441 KEARNY AVE,**  
**KEARNY NJ 07032**  
Visa, Mastercard, Discover

NEW YORK

audio-technica *Track*

**YOUR SEARCH IS OVER!**

We specialize in hard to find  
phono cartridges and original  
replacement styli only!!

**(800) 221-0906**

CALL TOLL-FREE FOR  
FREE PRICE QUOTES  
AND VISA/MC ORDERS  
N.Y. STATE (516) 599-1112

SEND SELF ADDRESSED  
STAMPED ENVELOPE FOR  
OUR FREE CATALOG.

**LYLE CARTRIDGES**  
115 South Corona Avenue  
Valley Stream, N.Y. 11582

Phones Open Mon-Sat 9 am-8 pm

TIPTOES MONSTER-CABLE SHURE STANTON

NEW YORK

*Celebrate  
the Senses*

SAVANT features more systems,  
with the widest array of design &  
installation options anywhere...

Acrotec • Air Tangent • Air Tight  
Analogue Productions • Apex • Arcam  
Arcici • Athena • Atlantic Technologies  
Audio Prism • Audiolab • Audiostatic • Basis  
Benz • Bitwise • Bright Star • Cardas • Chario  
Chesky • Clarity Audio • Clarity Recordings  
Creek • Day Sequerra • Delos  
Dorian • DWIN • EKSC • Electron Kinetics  
Eminent Technology • Ensemble • Epos  
Faroudja • Fosgate • Golden String  
Goldmund • Goldring • Grado  
Harmonia Mundi • JPW • Klyne • Last  
Mapleshade • Marigo Audio Labs • Merrill  
Micromega • Mod Squad • Mogami  
Morch • Nestorovic • Neutrik • Nimbus  
OmniMount • Opus 3 • PAC • Panamax  
Pioneer Professional • Power Wedge  
Pro Ac • Proprius • QED • Rega  
Reference Recordings • Revolver • Rockustics  
Roksan • RoomTune • Sheffield Labs  
Simply Physics • Sims • Solidsteel  
Sound Anchors • Stax • Stewart Filmscreen  
Sumiko • System Line • Target  
Tice Audio • Toshiba HD • Townshend Audio  
Water Lily • WBT • Wheaton • & More...

Savor these pleasures...  
Call SAVANT.  
800 628 0627 • 609 799 9664  
FAX: 609 799 8480  
Serving The World.

**SAVANT**  
A U D I O

**SHOP US  
LAST**

**WE WILL  
BEAT ANY  
PRICE\***

ADS • BOSE • CARVER • DENON •  
INFINITY • MONSTER • MTX • NILES •  
ONKYO • PIONEER • SONY ES •  
"Call For Others Not Listed"  
\*AUTHORIZED DEALERS

**The Sound Approach**  
6067 Jericho Tpke., Commack, NY 11725  
**800-368-2344**

NEW YORK

**ALPHA STEREO**  
Quality Components. Professional Installation & Service

**NAD**

"We are known for the  
companies we keep"

Adcom, NAD, Rotel, Onkyo, B&W,  
Ortofon, Audioquest, Monster Cable,  
M&K, AKG, Stax, Polk Audio, Atlantic  
Technologies, Audio Alchemy,  
Beyerdynamics, Sony, PSB, Sennheiser,  
Alpine, Boston Acoustics.  
Northern NY's oldest & most renowned dealer.  
57 Smithfield Blvd., Plattsburgh, NY 12901  
**518-561-2822**  
Fax: 518-561-2961  
Monday-Friday 10am-8pm. Saturday 10am-6pm  
Mastercard, Visa, Discover, Amex

**THE IRON CLOUD**  
COMPONENT DISPLAY RACK

- Dramatically display as many as 5 components weighing up to 35 lbs. each.
- All steel construction. 43" high x 22" wide x 18" deep.
- Easy assembly.

Only \$269 + \$7.50 pph

**NYAudio**  
516/277-8361

NEW YORK

Enjoy the music.

**B&W** Welcome to Select Sound!  
**Epos**  
**Krell** With expertise and integrity  
**Fosgate** we can help you create an  
**Meridian** audio system or home theatre  
**Promega** that can bring a wonderful  
**Pioneer** experience into your home...  
**Elite**  
**Rotel** Call us today or stop by our  
**Totem** beautiful store. You'll like  
**Target** the way we do business.  
**RoomTune**  
**WireWorld** Shipping Worldwide \* Specials  
**CWD & more!** Monthly \* Trade-Ins Accepted

**SELECT  
SOUND**

(516) 624-2124

6314 Northern Blvd, East Norwich  
at Oyster Bay, NY 11732 USA

PENNSYLVANIA

PHILADELPHIA  
AUDIOPHILES

Acoustic Energy	Harbeth	Rega Planar
Air Tight	Highwire	Roksan
Audible Illusions	Jadis	Rotel
Audio Alchemy	Kimber Kable	Sci-Fi
Audiolab	Kinergetics	Signet
Avalon	Klyne	SOTA
B&K Components	Koetsu	Soundcraftsmen
Cary	Melos	Spendor
CEC TL-1	Meridian	Stax
Classe	Micromega	Straight Wire
Counterpoint	M&K Sound	Target
Creek	Monitor Audio	Totem
DPA-Deltec	Muse	Transparent
Dynavector	NAD	Unity Audio
Eminent Tech.	Oracle	VAC
Epos	Parasound	VPI
Genesis	PS Audio	Well Tempered
Green Mountain	PSB	Wheaton

DAVID LEWIS AUDIO  
At Sound Service Company

8010 Bustleton Ave. Philadelphia, PA 19152  
(215) 725-4080 Bank Cards Accepted

TENNESSEE



CUMBERLAND  
AUDIO GROUP

REPRESENTING:  
 AUDIO RESEARCH • B&K •  
 BAW • BASIS • BENZ MICRO •  
 CALIFORNIA AUDIO LABS •  
 CARDAS • CELESTION •  
 CLASSE • CONRAD JOHNSON •  
 COUNTERPOINT • DAY •  
 SFOURIERA • GRADO •  
 GRAHAM • JEFF ROWLAND •  
 KIMBER KABLE • LINN •  
 MAGNUM DYNALAB •  
 MARTIN • LOGAN •  
 M. CORMACK •  
 MELLOS • MERL •  
 AUDIO • MERIDIAN •  
 MUSICAL DESIGN •  
 MII • PIONEER •  
 ELITE • PROTON •  
 ROTEL • RUNCO •  
 SOUND ANCHOR •  
 SPICA • STAX •  
 SUJAKO • TARGET •  
 TULIA DIGITAL •  
 TRANSPARENT •  
 VAC • WILSON •  
 YBA • CDs & LPs •



CREDIT CARDS • DELIVERY  
SET UP • MONTHLY P.L.G.



4119 HILLSBORO RD • NASHVILLE TN 37211  
(615) 297-4700

TEXAS

WE WILL BEAT ALL  
LEGITIMATE PRICES!

sony ▲ yamaha ▲ onkyo ▲ pioneer  
 kenwood ▲ jbl ▲ infinity ▲ canon-  
 sharp  
 ▲ hitachi ▲ go-video ▲ proscan  
 ▲ jvc ▲ toshiba ▲ panasonic

HOME THEATRE A/V RECEIVERS  
 SPEAKERS TV VCR FAX  
 AUDIO COMPONENTS  
 PROJECTION TV CD & LD PLAYERS  
 CAMCORDERS EDITING GEAR  
 PRO TRIPODS & MORE

COLONEL VIDEO & AUDIO

Houston, TX 1-800-423-VCRS

Fully Authorized Dealer  
Manufacturers Warranty

VERMONT

HERE IN VERMONT, PEOPLE DEMAND  
VALUE.  
 WE DON'T WASTE CUSTOMERS' MONEY  
AND NEITHER DO THESE FOLKS:

ADCOM ATLANTIS AUDIOQUEST B&W  
 DIGITAL PULSE GRADO MONSTER PSB  
 ONKYO ORACLE ROTEL SIGNET  
 STANDESIGN SUJAKO TANNY  
 TARGET THORENS WARETTDALE

5-YR WARRANTIES ON ALL  
NEW EQUIPMENT  
 0% FINANCING AVAILABLE  
 FOR INSTALLATION IN  
CT VERMONT & NY

TOLL-FREE  
800-456-4434

SCIENTIFIC  
STEREO  
 801 247 5857  
 129 Main St. BRATTLEBORO VT 05301

VIRGINIA

THE BEST IN HOME GROWN AUDIO.



Hi-Fi Farm

FEATURING:

Accuphase, Acurus, Aragen,  
 Quad, Alon, OCM, Magnum,  
 Woodside, Roksan, Spendor,  
 B&K, Kimber, VMPS, Cardas,  
 Creek, Epos, Micro-Mega,  
 and many more.

Also featuring high end used  
 equipment, fully guaranteed!

2039 Electric Rd., Roanoke, VA 24018

Call for information  
 1-703-772-4434

Nationwide Toll Free:  
 1-800-752-4018

All major credit cards accepted

WISCONSIN



ACI's Sapphire III

Awarded "Component  
 of Exceptional Merit"  
 by Martin G. De Wolf,  
 Publisher Bound for  
 Sound, No. 2a/94  
 Special sale pricing and  
 rebates on all ACI speakers!

Call (608) 784-4579 or  
 Fax (608) 784-6367

ACI

Authorized Dealer Since 1977  
 901 South 4th St.  
 La Crosse, WI 54601

WISCONSIN



Authorized Dealer For:

ADS	PSB
JVC	TARGET
LEXICON	CLARION
ACURUS	ROCKFORD/FOSGATE
SANUS	SENNHEISER
HUGHES	STEREOSTONE
HAFLER	CELESTION
SONY	SONY ES
MONSTER	BANG & OLUFSEN
NAD	ATLANTIC TECHNOLOGY
M & K	HARMAN KARDON
POLK	LUXMAN
ENERGY	NAKAMICHI
PROAC	P.S. AUDIO
AKG	NILES AUDIO
AVIA	AIWA PORTABLES

430 State St., Madison, WI 53703  
 608-255-2887

WISCONSIN

Audiophile's

One of the **FINEST** and **LARGEST**,  
 individually owned  
**AUDIO/VIDEO SALONS**  
 in the Country.

11 Private Listening Rooms  
 with 5 Home Theater Rooms

Custom Design and Installation  
 Specialists for over 22 years.

Sales and Service  
 for Wisconsin and the Nation.  
**2014 Main St. (Hwy. 14)**  
**Cross Plains, WI 53528**  
 (608) 798-3455  
 FAX (608) 798-3359

WISCONSIN



the **SoundSeller**



For the Musical Difference  
Authorized Dealer For:

- NAD
- GRADO
- PROAC
- APATURE
- VELODYNE
- CWD
- STAX
- SANUS
- M & K
- KEF
- ONKYO
- SONY ES
- ADCOM
- THORENS
- TARGET
- CARVER
- LEXICON
- ATLANTIC TECHNOLOGY
- NAKAMICHI
- AUDIOCONTROL
- CELESTION
- PSB
- NILES AUDIO
- NITTY GRITTY
- SOUNDSTREAM
- HARMAN KARDON
- MONSTER CABLE
- ALTEC LANSING
- ROCKFORD/FOSGATE
- POLK AUDIO

2808 Cahill Road, P.O. Box 224  
Marinette, WI 54143  
1-800-826-0520 (715) 735-9002

**PLEASE NOTE:** It is impossible for us to verify all of the claims of advertisers, including product availability and existence of warranties. To confirm that an advertiser is authorized to sell a product, we suggest you contact the manufacturer directly. Please review our *Tips for Mail Order Purchasers* in this section.

**AUTHORIZED**

WESCOTT AUDIO has the finest selection of high end components. Anywhere. Call Scott in State College, PA (800)669-7574.

\*\*\*\*\* ACCESSORIES TO COMPONENTS \*\*\*\*\*

**Audio Outlet...  
where audiophiles  
call audiophiles  
for great selection,  
great services and  
great prices!**



Sound Advice without the Price

914-666-0550

24-HR. FAX 914-666-0544

Monday-Friday

10am-7pm ET

★★ P.O. Box 673 • Bedford Hills, NY 10507-0673 ★★

**AUDIO UNLIMITED** in Colorado offers Accuphase, Acoustic Energy, Acrotec, AirTight, Airtangent, Audio Meca by Pierre Lurue, Audio Note, Basis, Benz-Micro, Bitwise, Chang, Chord, Chario, CODA, dpa Deltec, Day-Sequerra, Dynavecator, Ensemble, Graham, Harbeth, Ikeda, JM Labs, Kuzma, Magnum Dynalab, Micromega, Mission-Cyrus, Morch, Musical Design, Music Metre, Muse, NBS, NSM, Onix, Oracle, RoomTunes, Solid Steel, Sound Anchor, SOTA, Sendor, Tice, Tolem, Unity Audio, Vimak, Wheaton Triplaner, YBA, and more... PHONE/FAX John Barnes at (303)691-3407. Audio Unlimited, 2341 West Yale Ave., Englewood, CO 80110. VISA and MC accepted.

**SELL FOR CASH OR TRADE AUDIO & VIDEO EQUIPMENT. AUTHORIZED:** DENON, H/K, MARANTZ, ACURUS, ARCAM, NAKAMICHI, ROTEL, SUMO, CELESTION, DAHLQUIST, ENERGY, ROGERS, SIGNET, AUDIO ALCHEMY, AUDIOQUEST, GRADO, ETAL. **STEREO CLASSICS**, 75 CHURCH ST, NEW BRUNSWICK, NJ 08901. (908) 220-1144, FAX: (908) 220-1284

**AUDIOPHILE & SCHOLAR  
UNIVERSITY AUDIO SHOP, MADISON, WI**

**SPECIAL:** Spica SC30-\$299. **AUDIO RESEARCH**, MARTIN LOGAN, VANDERSTEEN, Totem, Epos, JMLabs, Paradigm, SYMDEX, Spica, NEAR, B&K, AMC, Creek, Aragon, YBA, Boulder, Michael Yee Audio, California Audio Labs, Micromega, Audio Alchemy, Rega, Stax, Magnum Dynalab, Fosgate, Soundstream, Runco, JVC, Grado, & TaraLabs. (608) 284-0001.

**FOR SALE**

**HI FI EXCHANGE.** Large selection of quality USED highend components at huge discounts. We buy, sell & trade. Call for inventory list. (718) 423-0400 or visit our showrooms at 251-11 Northern Blvd, Little Neck, NY 11363.

**STOP LISTENING IN DARKNESS!!! NOW'S YOUR CHANCE TO HAVE TRUE "HIGH-END" DIGITAL COMPONENTS AT PRICES ANYONE CAN AFFORD DURING OUR SPECTACULAR AUDIO ALCHEMY SALE! UNBELIEVABLE SAVINGS ON CD TRANSPORTS, D/A PROCESSORS, "JITTER-BUGS", CABLES, ACCESSORIES. DON'T BE FOOLED BY THE LOW PRICE! AUDIO ALCHEMY CD TRANSPORTS AND PROCESSORS COMPARE TO ANYTHING COSTING UP TO FIVE TIMES MORE! PLUS SPECIAL CLOSEOUT ON "DDS" TOP-LOAD TRANSPORT: LIST \$900.00. cLOSEOUT ONLY \$299.95! WE ALSO CARRY OTHER EQUIPMENT FOR AUDIOPHILES WITH MORE SENSE THAN MONEY. CALL NOE FOR COMPLETE "SPECIALS" LISTING..... HCM AUDIO (800) 222-3465. (916) 345-1341, FAX (916) 345-7269.**

**ABARGAIN: STAX SIGN/LAMBDA \$1,150; SIGN/SRM1-II \$799. PRO/LAMBDA(#1) \$459, SIGN/LAMBDA SRD/7 \$599; ED-1 \$550; ALL UNUSED (212) 966-1355.**

**SAVE 40% ON HIGH-END home speakers, subwoofers, amplifiers. FREE CATALOG, 3021 Sangamon Avenue, Springfield, IL 62702. 1-800-283-4644.**

**AUDIO INTERFACING ACCESSORIES** (over 300) for broadcasting, recording, sound reinforcement and live entertainment. Free catalog. SESCOM, INC. 1-800-634-3457.

**AUDIO RESEARCH SEVERAL USED UNITS AVAILABLE.** MCP-33, SP8, CL 60, D 115, ETC. CROWN MACRO REFERENCE AMPS AT HUGE SAVINGS. ALL THE LATEST AUDIO RESEARCH UNITS ON DISPLAY. NAKAMICHI 1000, DUNTECH AND B&W. CALL FOR LISTINGS AND PRICES ON USED EQUIPMENT. IDEAL ACOUSTICS, STARKVILLE, MS. 601-324-1020.

**AUDIO BY VAN ALSTINE INTRODUCES OMEGA III** buffered active feedback power amplifiers and buffered hybrid preamplifiers, high powered Fet-Valve hybrid vacuum tube amplifiers, and affordable straight-line tube and hybrid preamplifiers for ultimate faithfulness to the spirit of the music. Now ready — beautiful new 17" wide ultra-dynamic preamplifier featuring switchable tone controls, gold switch contacts, and gold jacks handling 9 sources and 5 loads. AVA ruggedly efficient amplifiers feature striated heatsinks and careful engineering—no output failures in two years! Complete line-only preamplifiers, headphone amplifiers, phase inverters, and more (wired and kits) starting under \$200. Hand crafted in the USA. **ATTENTION VINTAGE DYNACO AND HAFLER OWNERS.** Economically recycle your equipment for better than new performance. Eliminate old problems with our durable, rugged, musically convincing original designs. Complete PAS, PAT-4, PAT-5, and ST-70 rebuilds (kit or wired) from \$195 include new circuit cards and precision controls. AVA 300V/uS active feedback amplifier circuits for Dyna and Hafler chassis set new standards for transparency, definition, dynamic range, and liquidity. Write, call, or FAX for free illustrated catalog. Audio by Van Alstine, 2202 River Hills Drive, Burnsville, MN 55337. (612) 890-3517, FAX: (612) 894-3675.

**AUDIO NEXUS = QUALITY**

Featuring legendary **VANDERSTEEN** loudspeakers & **ROTEL** Components.

AMC • Apogee • Audio Alchemy • Audioquest • AudioStatic • B&K • Cardas • Cary • CWD • Dynalab • EAD • Exposure • Fanfare • Forte • Fried • Grado • JM Lab • Kimber • Kinergetics • Magnum • McCormack • Melos • Nakamichi • Power Wedge • PSB • Rotel • Jeff Rowland • Sony ES • Vandersteen • VPI SUMMIT, NJ (908)277-0333

**Hardbound AUDIO, annual bound volume editions**, just like the ones in the Editor-in-Chief's office. Various years available in limited quantities, \$40.00 each. Also available: Hardbound October Annual Equipment Directories. Years 1993, 1992, 1991 & 1990 \$15.95 each, and hardbound May Car Stereo Directories for years 1991, 1990, 1989 and 1985, \$8.00 each. All prices include postage and handling. All orders postpaid. Check or money order only (no credit card orders) payable to **AUDIO MAGAZINE**. Send orders to **AUDIO**, 1633 Broadway, New York, N.Y. 10019. Attn: Michael Bieber, Or call 212/767-6301 for further information.

**CABLE T.V. CONVERTERS, DESCRAMBLERS.** Scientific Atlanta, Zenith, Jerrold, Pioneer, Oak. Replacements for most models. Quality, Price & Service. Amex/Disc/Visa/MC. Dealer inquiries invited. **EAGLE Electronics Inc.**, 1-800-259-1187, #1, 1301 Railhead Blvd., Naples, FL 33963.

**REMOVE VOCALS** from music- Tanco Voice Decoder-\$79.95. Fully guaranteed. Call (813)847-9319 for pre-recorded demo/ordering information.

**RACK AND CHASSIS BOXES** for construction of electronic projects. Low cost; quick delivery. Call for free catalog. SESCOM, INC. 1-800-634-3457.

**CABLE T.V. CONVERTERS.** Jerrold®, Zenith, Pioneer, Oak, Scientific Atlanta, And Many More! 12 Years Experience Gives Us The **ADVANTAGE.** Visa/MC, Amex, COD. **ADVANTAGE ELECTRONICS INC.;** 1-800-952-3916; 1125 RIVERWOOD DR., BURNSVILLE, MN 55337. Void where prohibited.

**FOR TWENTY YEARS WE HAVE BEEN THE SOURCE FOR ALL OF YOUR BLANK AUDIO/VIDEO TAPES AND ACCESSORIES, EVEN REEL-TO-REEL TAPES FOR STUDIOS, AT DISCOUNTED PRICES. CATALOG AVAILABLE.** SOUND INVESTMENT CORPORATION, 3586 PIERCE DRIVE, CHAMBLEE, GA 30341. (800) 659-TAPE (8273), IN GA (404) 458-1679. FAX: (404) 458-0276.

**DEALERS...**

The best place to be seen is where people are looking.

And each month, both enthusiasts & dealers read **AUDIO** for information.

The **AUDIO Dealer Showcase** is an ideal forum to reach interested audio/video enthusiasts who are active buyers themselves, and who advise others on stereo and video purchases.

The Dealer Showcase is an exclusive section designed to showcase your advertising in **AUDIO**.

To place your ads, or for further information call Toll Free:

**1-800-445-6066**  
9am to 5pm est

In Canada:  
**1-212-767-5750**



FOR SALE



PUT SOME MAGIC BACK IN YOUR  
MUSIC LISTENING



THERE IS A WORLD OF WONDERFULLY RICH MUSICAL DETAIL IN YOUR OLD RECORDS. ALL THAT YOU NEED TO UNLOCK THESE TREASURES IS A "GREAT TURNTABLE" — THE HW-19 MK.4.

STEREOPHILE MAGAZINE - 1992 ANALOG PRODUCT OF THE YEAR

VPI IND. INC. 77 CLIFFWOOD AVE. 3B CLIFFWOOD NEW JERSEY 07721 908-946-8606 FAX 908-946-8578

**AUDIO POWER AMPLIFIERS.** 100-500 WRMS/CH. Completely assembled and tested from only \$188.00 to \$223.00 each. Satisfaction Guaranteed. Call Electronics Hospital (407)952-3838.

**DJ & Nightclub  
Sound & Lighting CATALOG**

FREE 68-Page Catalog with a huge selection of name brand professional gear for DJ's, Clubs & Musicians all at discount prices!

**Call Today  
800-945-9300**

Mail Order Center: 11711 Monarch St.  
Garden Grove, CA 92641  
Retail Super Store: 13110 Magnolia St  
Garden Grove, CA 92644 (714)-530-6780

**PRO SOUND & STAGE LIGHTING™** **OUR 18th YEAR!**

**COMPLETE LINE OF TOP NAME BRAND AUTO AND HOME COMPONENTS, AMPLIFIERS, CD PLAYERS, SPEAKERS, BANDPASS BOXES AND TUBES, OTHERS AND ACCESSORIES. LIFETIME WARRANTIES AVAILABLE ON MOST COMPONENTS. SEND \$1.00 TO G&G AUDIO DISCOUNTERS, 113 LIBERTY STREET, P.O. BOX 7170, BELLE CHASSE, LA 70037. (504)393-7706.**

**THE FIRST JITTER-FREE TRANSPORT IS AVAILABLE NOW!** AT \$649, THE REFERENCE ONE TRANSPORT REPRESENTS A BREAKTHROUGH IN TECHNOLOGY AND PRICE. ISOLATED STABLE CLOCK MODULE AND OTL TRANSPORT DRIVER BOARD ALSO AVAILABLE. TURN YOUR CDS INTO MUSIC. G & D TRANSFORMS. (602) 650-1155.

**XXX-TREME DISCOUNTS!!**

ONKYO—DENON—C.RVER—ACURUS—NAKAMICHI—  
NAD—PARASOUND—FOSGATE—APATURE—SUMIKO—  
KEF—SNELL—POLK—M & K—NHT—SPICA—  
VELODYNE—PSB—CHICAGO STANDS. U.S. products. NO  
GREY! Many closeout deals! STEREO TECH. 414-836-2942

**AUDIO CLASSICS, LTD.**

**Buy-Sells-Trades-Repairs-Modifies.**

(AI) = AS IS, (D) = Demo, (EX) = Excellent, (F) = Fair, (G) = Good, (M) = Mint, (N) = New. **AMPLIFIERS:** Carver TFM15CB(D) \$396, Crown MACRO-REF (D) \$3199; Krell KSA200S (EX) \$4995, KSA300S (M) \$6339; Levinson ML11 (M) \$1199; Manley STEREO-75/75 (D) \$1799; Marantz 250M (C1) \$399; McIntosh MC40 (EX) \$995; MC225 (EX) \$899, MC240 (EX) \$1899, MC2100 (AI) \$299, MC2105 \$399-899, MC2120 (G) \$799, MC2205 (EX) \$1499, MI200 (UNK) \$2000; Motif MS2001 (N) \$2099; Music Reference RM9 (EX) \$1499; Parasound HCA2200 (D) \$899; PS Audio DELTA-250 (D) \$995; Sonograph SA150 (N) \$499, Yamaha M70 (AI) \$299. **CASSETTE DECKS:** Carver TDR1550 (D) \$415; Denon RR680 (EX) \$199. **CD PLAYERS:** Carver SD/A360 (D) \$296; Denon DCD3520 (D) \$1049. **CD PROCESSORS:** Krell SBP64X (M) \$2669, STUDIO (M) \$2169. **PHONOGRAPHS:** Victor CREDENZA (G) \$4000. **PREAMPS:** Conrad-Johnson PR6 (D) \$529; Threshold M1 (EX) \$299. **PREAMPLIFIERS:** Audio Research Corp. SP9-MKII (EX) \$1295; Conrad-Johnson PF1L (M) \$559, PV9 (EX) \$1695, PV11 (EX) \$1199; Denon DAP2500 (EX) \$449; GAS THALIA (AI) \$149; Krell KRC2 (M) \$2295, PAM7 (EX) \$999; Marantz 3600 (EX) \$499; McIntosh C8 \$2-400, C11 (G) \$1495, C20 (EX) \$1399, C22 \$1995, C28 \$2-600, C31V (EX) \$1249, C34V (EX) \$1499; PS Audio PS4.6 (EX) \$399, PS6.1 (D) \$349; Sonograph SC22 (N) \$349; Superphon REVELATION-II (G) \$349; **PROCESSORS:** Audio Control PCA200 (D) \$279; Carver DPL20 (EX) \$231. **SPEAKERS:** Apogee DUETTA (EX) \$1299, MINOR (M) \$899, SLANT-6 (EX) \$1589, SLANT-8 (EX) \$3995; Dahquist DQ10 (G) \$499; Genesis IM8200 (N) \$699; Linaeum LFX (D) \$525, LS2 (D) \$419; Magnepan MGIIIA (NOS) \$1399; McIntosh ML1C (EX) \$999; Synthesis LM260A (D) \$839; Yamaha NS500 (EX) \$199. **TEST EQUIPMENT:** Audio Control R130 (N) \$649; McIntosh AA2 (EX) \$749, MPI4 (EX) \$1599; Sound Technology 1700B (G) \$699. **TUNER PREAMPS:** McIntosh MX110 \$399-499, MX113 (EX) \$599. **TUNERS:** Carver TX11B (N) \$739; Luxman T117 (AI) \$249; Magnum-Dynalab FT'01 (D) \$799, ETUDE (D) \$1269; McIntosh MR65B \$399-799, MR67 \$249-1200, MR78 (EX) \$999-1799. **FURNITURES:** Acoustic Research XA (EX) \$199; Denon DP7F (N) \$280, DP45F (G) \$99; Thorens TD124/II (EX) \$395. **VIDEO DISC PLAYERS:** Denon LA3000 (D) \$599, LA3100 (D) \$919. **FREE Catalogue.** 8AM-5PM EST Mon.-Fri.

**AUDIO CLASSICS, LTD.**

POB 176AAA, Walton, NY 13856

**607-865-7200**

FAX: 607-865-7222

**TIPS FOR MAIL ORDER PURCHASERS**

It is impossible for us to verify all of the claims of advertisers, including product availability and existence of warranties. Therefore, the following information is provided for your protection.

1. Confirm price and merchandise information with the seller, including brand, model, color or finish, accessories and rebates included in the price.
2. Understand the seller's return and refund-policy, including the allowable return period, who pays the postage for returned merchandise, and whether there is any "restocking" charge.
3. Understand the product's warranty. Is there a manufacturer's warranty, and if so, is it from a U.S. or foreign manufacturer? Note that many manufacturers assert that, even if the product comes with a U.S. manufacturer's warranty card, if you purchase from an unauthorized dealer, you are not covered by the manufacturer's warranty. If in doubt, contact the manufacturer directly. In addition to, or instead of, the manufacturer's warranty, the seller may offer its own warranty. In either case, what is covered by warranty, how long is the warranty period, where will the product be serviced, what do you have to do, and will the product be repaired or replaced? You may want to receive a copy of the written warranty before placing your order.
4. Keep a copy of all transactions, including cancelled checks, receipts and correspondence. For phone orders, make a note of the order including merchandise ordered, price, order date, expected delivery date and salesperson's name.
5. If the merchandise is not shipped within the promised time or if no time was promised, 30 days of receipt of the order, you generally have the right to cancel the order and get a refund.
6. Merchandise substitution without your express prior consent is not allowed.
7. If you have a problem with your order or the merchandise, write a letter to the seller with all the pertinent information and keep a copy.
8. If you are unable to obtain satisfaction from the seller, contact the consumer protection agency in the seller's state or your local Post Office.

If, after following the above guidelines, you experience a problem with a mail order advertiser that you are unable to resolve, please let us know. Write to the Advertising Director of AUDIO Magazine, Scott Constantine. Be sure to include copies of all correspondence.

CLASSIFIED ADVERTISING

## FOR SALE

KEF, MIRAGE, B&W, H/K, NAKAMICHI, CARVER, DENON, ADCOM, ONKYO, KLIPSCH, LEXICON, NHT, ROCK SOLID, AUDIO QUEST & MONSTER CABLE—BEST PRICES & CLOSEOUTS. U.S.A.: 1-800-380-5111.

## Music Metre

Performance Audio Cables

SILVER INTERCONNECTS  
\$400 / 1 Meter

SILVER SPEAKER CABLES  
\$60.00 / foot

99.99% Pure Silver for  
the Finest Musical Experience

FIDELUS DIGITAL CABLE  
\$250 / 1 Meter

Information and reviews available

1147 E. Broadway, Suite 40, Glendale, CA 91205  
818/242-4535 • Fax 818/242-4415

## MUSICAL CONCEPTS = CD MUSICALITY

Blissful satisfaction with CD sound is possible! ENIGMA, "\$10,000 smoothness" for \$695, EPOCH, "Seductive, Sweet, Natural!" \$995, CDT-4 Transport \$695. All have "Stable Platter"! ENTRE CD player and CDT-5 Transport "Simply incredible values", \$495/each. Audio Alchemy mods and power supplies, from \$149. We modify Philips-based, Pioneer CD/Laserdisc. We add "COAX" to CD/Laserdisc with "OPTICAL". MUSICAL CONCEPTS, 5749 WESTWOOD DR., ST. CHARLES, MO 63304. 1-314-447-0040.

## BEST \$1,500 LOUDSPEAKERS THX HOME THEATER

Alon - B&W - VMPS - Bang & Olufsen - Adcom - KEF - Harman/Kardon - Mirage - Crown - Celestion - Eminent Technology - McCormick - VTL - Denon - Triad - Polk - Velodyne - Fosgate - Signet - Audible Illusions - Snell - NHT - Carver - B&K - Quad - Alchemy + 25 More Brands. Honest Advice! TECH ELECTRONICS (904) 376-8080. Not affiliated with Amerisound or STI.

## Wholesale Connection

Call Toll Free 1-800-226-2800

Receivers • C.D. Players • Tape Decks • Mini Disc Recorders • CAT Recorders • Home Speakers • Mini Systems • Laser Disc Players. JVC • Technics • Kenwood • Pioneer • Harman/Kardon • Bose • Infinity • Advent • Pinnacle • Aiwa & More.

Wholesale Connection, 63-48 108th St.  
Forrest Hills, NY 11375

## STEVE'S CONSIGNMENT SHOP

Hi Fi Farm and Steve's Audio advice now offers consignment opportunities for the used Audio market. Top Dollar Offered. Call for Information. New Equipment also. Call 1-800-752-4018.

APOGEE SPEAKERS WITH ACTIVE CROSSOVER & STANDS \$2800; AUDIO ALCHEMY TOP LOADING TRANSPORT, XDP, DTI \$999; EAD DSP 7000 A/D CONVERTER WITH MKII UPDATE \$925; LINN DMS SPEAKERS WITH STANDS, PANELS, CROSSOVERS \$4000; LINN KARIK/NUMERIK CD PLAYER/D/A CONVERTER \$4500; PSE STUDIO IV AMP \$695. CALL TERRY: (402) 391-3842.

**SINGERS!** REMOVE VOCALS  
**Unlimited Backgrounds™**  
From Standard Tapes, Records, & CDs with the Thompson Vocal Eliminator™ Call Now for Free Catalog & Demo Tape.  
Phone (404)482-4189-Ext 51  
LT Sound, Dept AU-15  
7938 LT Parkway  
Lithonia, GA 30058  
24 Hour Demo/Info Request  
Line (404)482-2485 - Ext 51  
The Thompson Vocal Eliminator™ - Better Than Karaoke!



B•O • B•W • CARVER • DENON • FOSGATE • H/K • KEF • LEXICON • NAD • NAKAMICHI • ONKYO • POLK • VELODYNE • 24 HOUR AUTOMATED PRICING • MANUFACTURERS WARRANTIES • COURTEOUS ASSISTANCE • AMERICAN THEATER SYSTEMS (904) 321-0100.

## AUDIO CONNECTION = PERFECTION VANDERSTEEN ARCAM ROTEL

AYRE • QUICKSILVER • SONIC FRONTIERS • OCM • B&K • MUSIC REFERENCE • PSB • GRADO • PRO-AC • PSE • AUDIBLE ILLUSIONS • B&W • AUDIOLAB • MORE! TRADE-INS AND USED. AUDIO CONNECTION, 615 BLOOMFIELD AVENUE, VERONA, NJ 07044. (201) 239-1799. FAX: (201) 239-1725.

## MONEY SPENT SOUNDLY

### AUDIO EXCELLENCE, INC.

THE BEST AUDIO & VIDEO EQUIPMENT FROM ALL MAJOR MANUFACTURERS  
DENON • NAKAMICHI • ONKYO  
SONY ES • YAMAHA • BOSE • KLIPSCH  
KEF • POLK • AND MORE!

SPECIALISTS IN HOME THEATRE SYSTEMS & HIGH-END AUDIO

CALL NOW (212) 229-1622

143 West 26th Street, New York, NY 10001  
All Major Credit Cards Accepted



## Greencorp USA, Inc.

Premium quality cassettes  
at wholesale prices

• Made in Australia •

Call 1-800-972-0707

## FREE SHIPPING! PLUS:

EXPERIENCED, FRIENDLY ADVICE! MIRAGE, PS, CWD, KEF, KINERGETICS, PHILIPS, AUDIOQUEST, FRIED, MONSTER, KIMBER KABLE, SPICA, CARY, STRAIGHTWIRE, QUAD, MORE! READ BROTHERS, 593 KING, CHARLESTON, SC 29403. (803) 723-7276.

P.A.U.L. purveyors of fine American and European components: Aputure, Arcici, AudioSource, Bear Labs, Billy Bags, Celestion, Linaeum, Maplenoll, Micromega, McCormack, MSB Technology, Music Reference, Purest Audio, Solidsteel, Virtual Image. THE SOUND SOLUTION.

## AUDIO CABLES & MORE

DON'T PAY EXORBITANT PRICES FOR TOP QUALITY. WE HAVE YEARS OF EXPERIENCE IN WIRE MANUFACTURING AND HAVE SIMULATED THE HIGH PRICED BRANDS. HIGH PRICED EQUIVALENTS AS LOW AS .74/FT. WE DEMYSTIFY WIRE TECHNOLOGY. SEND FOR EXPLANATION LITERATURE WHICH ALSO INCLUDES ALL OUR AUDIO PRODUCTS PRICE LIST OR CALL OUR LITERATURE REQUEST # (800) 321-2108, 24 HRS. DAY. FAX (609) 428-1832. L A T INTERNATIONAL, DEPT A, 317 PROVINCETOWN RD., CHERRY HILL, NJ 08034.

AUDIO SOLUTIONS is Atlanta's Hi-End source for Audio Research, Theta, McCormack, Wire World, Cary Audio, Vandersteen, CODA, Straightwire, Acurus, Snell, Sumiko, SOTA, NHT, Kimber Kable, Magnum Dynalab, Audible Illusions, Rotel, VPI, Paradigm, Dunlavy, Sony ES, Sony Video, Pass Labs, Proac. 5576 Chamblee Dunwoody rd. (404)804-8977.

BEST BRANDS + TRADE-INS! WE CARRY VIRTUALLY ALL LINES OF TUBE, DIGITAL, PHONO EQUIPMENT, + CABLES + ACCESSORIES. HUGE DEMO/USED EQUIPMENT LIST. SEE OKLAHOMA DEALER SHOWCASE AD IN OCTOBER AUDIO BUYERS GUIDE ISSUE P. 307. AUDIO CLASSICS ENTERPRISES, OKLA. CALL: (405) 842-3033.

### HYPE! HYPE! HYPE!

You get enough elsewhere! We've delivered something different for 15 years—natural, musical results! "Musically exciting" Adcom, B&K and Hafler modifications. Dual-Mono Adcom GFA-555 mods. Smooth, delicate B&K mods. PA-1 driver boards for Hafler amps—budget bliss! Don't be high-end pretenders, be contenders, call us today! MUSICAL CONCEPTS, 5749 WESTWOOD DR., ST. CHARLES, MO 63304. (314) 447-0040.

## LOUDSPEAKERS

## SPEAKER CATALOG

Parts Express is a full-line distributor of electronic parts and accessories geared toward the consumer electronics industry and the technical hobbyist. We stock an extensive line of speaker drivers and accessories for home and car. Send for your FREE 188 page catalog today.

Parts Express  
340 E. First Street  
Dayton, Ohio 45402-1257



1-800-338-0531

### HOW TO DESIGN A GREAT SPEAKER!

Find the best drivers you can, add a 4th order x-over, assemble in a non-resonant enclosure. Speakers \$995-\$24,995 DAC's \$695-\$2295. MACH 1 Acoustics, fax/phone (603) 654-9826.

## ROTTEN FOAM EDGES?

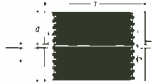
SIMPLY SPEAKERS does professional foam replacements any size/brand. 7 Year Warranty. We sell DIY Foam Surround Kits for less! Speaker retooling. MC/VISA/DISCOVER: 1-800-767-4041

**LOUDSPEAKERS**

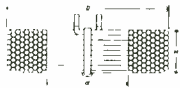
**SOLENSPEAKER COMPONENTS**



**CROSSOVER COMPONENTS**



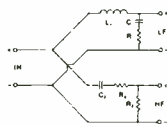
**FAST CAPACITORS**  
Metalized Polypropylene (Non-Polarized)  
Values from 1.0 mfd to 220 mfd  
Voltage Rating 250 VDC / 150 VAC



**SOLENS INDUCTORS**  
Perfect Lay Hexagonal Winding Air Cored  
Values from 10 mH to 30 mH  
Wire Sizes from #20 AWG to #10 AWG



**HEPTA-LITZ INDUCTORS**  
Seven Strands Litz-Wire Constructions  
Values from 10 mH to 30 mH  
Wire sizes from #18 AWG to #12 AWG



**SOLENS CROSSOVERS**  
Custom Computer Design  
Passive Crossover for Professional, Hi-Fi and  
Car Hi-Fi, Power up to 1000 Watt

**CROSSOVER, SPEAKER PARTS**  
Gold Speaker Terminals, Gold Banana Plugs,  
Gold Binding Posts, Crossover Terminals,  
Power Resistors, Mylar Capacitors,  
Plastic Grill Fasteners, Nylon Ty-Wraps,  
Car Speaker Grills, Masc Parts



**SOLENS INC.**  
4470 AVENUE THIBAUT  
ST-HUBERT, QC J3Y 7T9  
CANADA

TÉL: (514) 656-2759  
FAX: (514) 443-4949

Computer Aided Design for enclosure and crossover available to customer  
CATALOG \$6.00 REFUNDABLE

**NEW 1994 CATALOG**

**VMPS factory assembled speakers.** Low Prices, shipped direct to you. Free Price sheet. Arthur Morgan, 886 East Charing Cross CR., Lake Mary, FL 32746.

**LOUDSPEAKER COMPONENT - KITS.** Audio Concepts, Dynaudio, Eclipse, Eton, LPG, Vifa, more! Crossover parts, design books & repairs. Catalog \$2.00. **MENISCUS**, 2575 28th St., S.W., Dept. A, Wyoming, MI 49509. (616) 534-9121.

**CUSTOM ACTIVE ELECTRONIC CROSSOVERS.** 6 to 36 dB/Oct. Also Snell, Magneplan versions. **DB SYSTEMS**, POB 460, RINDGE, NH 03461. (603) 899-5121.

**RIBBON BASED LOUDSPEAKERS.** Superb soundstaging & definition without the usual planar headaches. Full range systems, modules & kits. Ideal for integrating true hifi sound with both surround standards. Call or fax (24 hrs) for information & reviews. Newform Research Inc. 705-835-9000.

**23 YEARS OF CRITICAL ACCLAIM**



**FULL ROOM STEREO™**

**3-D STEREO IMAGE LOUDSPEAKERS**

**FREE CATALOGUE!** 800-231-3458. No matter where you sit you will hear balanced 3-D stereo image with Ohm FRS™ speakers. All Ohm speakers are designed to deliver **FULL ROOM STEREO™**. American Records Inc., 409 Plandome Rd., Manhasset, NY 11030. **FACTORY AUTHORIZED SALES/SERVICE.** Discover/Visa/MC/AMEX.

**HAL COX (FRIEND OF JIM LANSING), SINCE 1947 BUYS/SELLS "HARTSFIELD", JBL, ALTEC, EV-PARAGON, OLYMPUS. SHIPS WORLDWIDE. VISA/MC.** (415) 388-5711. FAX (415) 388-3359. 164 TAMALPAIS AVENUE, MILL VALLEY, CA 94941. (415) 388-5711. SAN FRANCISCO AREA.



**SRD is dedicated to designing & building high performance, high quality speakers at affordable prices.** We have a complete line of Audio/Video speaker systems. We sell factory direct only! Speakers starting at \$275/pr. 30 day trial period & 5yr warranty. We offer Pioneer products. Call for brochure & pricing. **SRD SPEAKERS**, Houston, TX. 1-800-353-9899. Visa/MC/AMEX.

*"Seductive."*



*Every component matched for the ultimate stereophonic reproduction.*

**NSM Loudspeakers®**

Box 326, Garden City, New York 11530-0326  
Phone: 516-486-8285, Fax: 516-538-0933

**LOUDSPEAKER CABINETS** Large selection of excellent quality loudspeaker cabinets for custom builders and dealers. Grenier Cabinets, 189 Jennings Road, Horseheads, N.Y. 14845 (607)594-3838.

**STATE OF THE ART CROSSOVER NETWORKS.** UP-GRADE ANY SPEAKER SYSTEM. **FREE DESIGN GUIDE.** ALLPASS TECHNOLOGIES, INC., P.O. BOX 453, AMITYVILLE, NY 11701. (516) 598-1320.

**Madisound Presents Sledgling**

*The Perfect Holiday Gift*

The Sledgling is the best little bookshelf speaker kit on the market today. The Sledgling speaker is small enough to fit unobtrusively in any den or be used as a rear channel speaker. We chose a high quality 6 1/2" polypropylene woofer and a Vifa treated textile dome tweeter with ferrofluid for a very clean sound. We have utilized the best possible components in the crossover network with Sidewinder coils and Chateauroux Metallized Polypropylene capacitors on an epoxy circuit board.

The kit is designed to be as easy as possible to assemble. The cabinet is already finished. The holes for the drivers and the input cup are pre-cut; the crossover is preassembled, and the grill cloth is stretched on the frame. The assembly of this kit does require some soldering ability.

**Specifications:**

Impedance: 4 Ω or 8 Ω  
(Please specify)

Sensitivity: 90 db

Power Rating: 50 Watts

Freq. Range: 65 - 25000 HZ  
+/- 3db

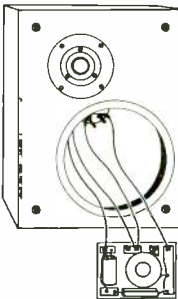
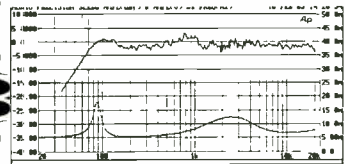
Woofer: 6 1/2"

Tweeter: 3/4" Dome

Crossover: 6/6 db  
w/ Sidewinder 16awg Coils  
and Polypropylene Capacitors

Cabinet: Walnut Wood  
Veneer or, Black Lacquer  
9"x12"x6"

**\$150/pair Walnut  
\$145/pair Black**



**Ordering Information:** All speaker orders will be shipped promptly by UPS. COD requires a 25% prepayment, and personal checks must clear before shipment. Add 10% for shipping charges (Residents of Alaska, Canada and Hawaii, and those who require Blue Label air service, please add 25%). There is no fee for packaging or handling, and we will refund to the exact shipping charge. We accept Mastercharge or Visa on mail and phone orders.

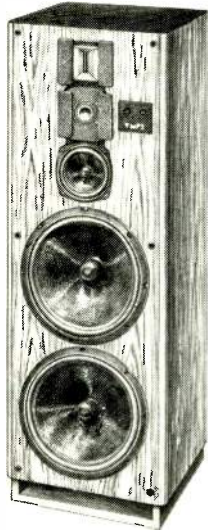


**Madisound Speaker Components**  
(8608 University Green)  
P.O. Box 44283  
Madison, WI 53744-4283 U.S.A.  
Voice: 608-831-3433  
Fax: 608-831-3771

CLASSIFIED ADVERTISING

## LOUDSPEAKERS

# BETTER LOUDSPEAKER TECHNOLOGY



The VMPS Tower II SE 45 x 15 x 16", 109 lbs., \$1476/pr kit, \$1876/pr. assem in lt. oak, dk oak, or satin black.

The VMPS **Tower II Special Edition**, the deluxe version of an Audio Magazine "Best Buy" system, is now available with exclusive handbuilt, phase-plugged **woven carbon fiber** 12" woofers, the finest dynamic drivers extant.

These high-tech cones are also now standard in our flagship **FF-1 Focused Field Array** (\$6800-\$7200pr), four of which made up the VMPS 1994 WCES Surround Sound display. After auditioning every multichannel/Home Theater display at the Show, the editor of *Widescreen Review* judged the VMPS room best, and by a wide margin. Call or write for copies of the full editorial, or for brochures and test reports on all VMPS systems including our four **Subwoofers** (\$289-\$649ea), the **QS0626** and **Dipole Surround A/V monitors** (\$289-\$349ea), **QSO Series** bookshelf systems, and more. Kit versions of most systems are available, and prices include free shipping in 48 states.

## VMPS AUDIO PRODUCTS

div. Itone Audio  
3429 Morningside Dr.  
El Sobrante, CA 94803  
(510) 222-4276 Fax: (510) 232-3837

Hear VMPS at: The Listening Studio, Boston; Sounds Incredible, Brookfield CT; Dynamic Sound, Washington DC; Hifi Farm, Roanoke VA; Home Theater Systems, Little Falls NJ; Mark Curry, Las Vegas, NV; AMUG, Phoenix AZ; Rama Audio, Sun Valley CA; American Audio, Greenville SC; Chattanooga Valley Audio, Rossville GA; Tech Electronics, Gainesville FL; Arthur Morgan, Lake Mary FL; DNA Audio, Orange City FL; Sounds Deluxe, Clarendon Hills IL; Audio Exchange, Mishawaka IN; Audio Connection, Terre Haute IN; Ruth Industries, St. Louis MO; Shadow Creek Ltd, Minneapolis MN; Audio by Gil Morrison, Detroit MI; Lookout Electronics, Longview WA; Affordable Audio, Fresno, CA; Exclusively Entertainment, Oceanside, CA; Hal Broda, Escondido CA; Christopher Hansen Ltd., Beverly Hills CA; Audio Haven, Brea CA; Sounds Unique, San Jose CA; Private Line Home Entertainment, Stockton CA; Golden Ear, Chico CA; Itone Audio, El Sobrante CA; James Romeyn, Petaluma CA; The Sound Room, Vancouver BC Canada

## REPAIR FOAM ROT FOR YOURSELF!

SAT will save you hundreds of dollars! All sizes including AR, Advent, BOSE, JBL. Surrounds, adhesive & instructions: \$27.95/pr BOSE 901's \$67.95/pr. (incl. S/H, No CDD's) Do it yourself with SAT!



800-747-3692 MC/VISA  
704-697-9001 24 Hr  
STEPP AUDIO TECHNOLOGIES  
PO Box 1088, Flat Rock, NC 28731 incl. make & model w/order

**SPEAKER GRILLES**- Professional quality, custom size grilles made to order. Grenier Cabinets (607)594-3838 or FAX (607)594-4019.

## TRUE SUBWOOFER

With phenomenal *true* deep bass extending below 20Hz with low distortion at a very affordable price.

The new HRSW12V will extend the bass of your stereo or video system for that "air shaking all around you" effect.



HSU Research HRSW12V

Here's what the experts said of our 100W, 25Hz prototype shown at the Winter CES (production units are 150W, 20Hz):

"...all of the non-boomy, stomach-massaging bass energy was coming from a single 12-inch powered subwoofer..."  
Peter Mitchell, *Stereophile* Vol. 17 No. 4, April 1994

"...delivered enough punch to shake the sturdiest shelf..."  
Brent Butterworth, *Video Magazine*, April 1994

"One of the most effective subwoofer demonstrations"  
Gary Reber, *Widescreen Review* Vol. 3 No. 1, March 1994

Send for complete information on the HRSW12V and our famous HRSW10s.



Write or call:  
**HSU RESEARCH**  
20013 Rainbow Way, Cerritos, CA 90701  
1-800-554-0150 (Voice)  
1-310-924-7550 (Voice/Fax)

Sold factory direct with a 30 day trial - money back guarantee. 5 year manufacturer's defect warranty.

## SPEAKER GRILL CLOTH

"ACOUSTICALLY TRANSPARENT" 6 COLORS AVAILABLE • HIGH GRADE. ALSO GRILL PEGS, GRILL FOAM, CUSTOM GRILLS MADE. **SPEAKERWORLD INC.** (813)544-3511. MC-VISA-AMEX.

Factory  
Direct Service

**Ohm**  
Complete Speaker Catalog  
and Dealer Listings  
(718) 783-1111

Upgrades and Drivers plus Systems from \$200 to \$7000 per pair. Ohm Acoustics Corp. 241 Taaffe Pl., Brooklyn, N.Y. 11205.

## DYNAUDIO SPEAKER KITS.

Discover the SUPERIOR SOUND QUALITY of 1994 DYNAUDIO SPEAKER KITS. Catalog \$2.00 (Refunded). ADVANCED AKUSTIC • 7627 Woodside • Stockton • California • 95207. (209) 477-5045.

## RECORDS

**PRESERVE + MAINTAIN + RESTORE™**  
LP-78RPM-4CH • Pickering • Stanton • Shure • Nitty Gritty • Vacuum Record Cleaners from \$99.95 • Special Brushes & Fluids • 3-Speed Turntables • Signal Processors • Discounts • Free Catalog! • **KAB Electro-Acoustics**, P.O. Box 2922, Plainfield, N.J. 07062-0922 (908)754-1479.

**HALF MILE VINYL.** Quality pre-owned LP's. F/Information, Catalog, SASE: Box 98, East Wareham, MA 02538. (508) 295-2508.

**LV/CD/RECORD COLLECTOR'S SUPPLIES.** Jewel boxes, record jackets, sleeves, storage boxes, 78 sleeves, dividers, much more! Free brochure: CABCO PRODUCTS, ROOM 663, POB 8212, COLUMBUS, OH 43201. (614) 267-8468.

## COMPACT DISCS



## REFERENCE RECORDINGS®

Edge-of-the-art HDCD digital technology. Pure Analogue HQ-180 LPs, and world-renowned musical artists! Fall releases feature Frederick Fennell and the Dallas Wind Symphony (**Beachcomber**); Dick Hyman and all-star small groups (**From the Age of Swing**), Eileen Farrell (**My Very Best**) and 200 voices of the Turtle Creek Chorale (**Postcards**). For free catalogue: 800-336-8866 or Box 77225X, San Francisco CA 94107.

## AUDIOPHILE RECORDS

**AUDIOPHILE LP&CDs**

Analogue Productions  
Mobile Fidelity • Wilson  
Reference Recording • Chesky  
Sheffield Lab • Harmonia Mundi  
Proprius • RCA Living Stereo • Klavier  
Mercury Living Presence • plus many more  
in and out of print recordings!

Catalog \$3 In USA, \$5 elsewhere - refundable

**ACOUSTIC SOUNDS 1-800-525-1630**  
P.O. BOX 2043 • SALINA, KS 67402-2043  
1-913-825-8609 • FAX 1-913-825-0156

Visa  
MasterCard

**FOR SALE: 78 SPEED RECORDS. LARGE VARIETY INCLUDING COUNTRY WESTERN, POPULAR VOCALISTS, EUROPEAN MUSIC. FOR LIST—(701) 252-5774 (MACHINE) OR (701) 252-7370.**

## ANNOUNCEMENT !!

Audiophile albums have returned!!! So has your favorite supplier **SOUND ADVICE!!** Dennis urges all former patrons to call, verify address information, and receive our mailings. -Featuring the complete catalogs of: Mobile Fidelity, Reference Recordings, Classic 'Living Stereo' reissues, Chesky, Sheffield, Wilson, Analogue, etc...**SOUND ADVICE** — 8215 Grand Ave, Kansas City, MO 64114. Information: 816-361-2713. All accounts, old or new, may call 1-800-361-8676 to order or verify mailing information.

## WANTED TO BUY

**TOP DOLLAR PAID FOR YOUR USED AUDIO EQUIPMENT. HI FI EXCHANGE (718) 423-0400.**

**CASH for USED AUDIO & VIDEO EQUIP. BUYING and SELLING by PHONE. CALL for HIGHEST QUOTE. (215) 886-1650** Since 1984. The Stereo Trading Outlet, 320 Old York Road, Jenkintown, PA 19046.

**KLIPSCHORNS FACTORY BUILT 1948-1955. ESPECIALLY BLONDE "PRIMAVERA". ALSO OLD HERESY AND CORNWALL SINGLES, BLONDE OR MAHOGANY (708)629-7638.**

Since 1977 David Yo always buying: Teak Marantz, McIntosh, ARC, Fisher, Dynaco, Quad, Leuk, Western Electric equipments, others. Vintage speakers, raw units by Western Electric, Tannoy, Jensen, JBL, Altec, EV(Patricians), RCA-LC1A. Audio tubes(KT86/77/88, 7591, 6550, etc.) by Telefunken, Genalex, Mullard, RCA, Tungsol, etc. P.O. Box 28082, Northridge, CA. 91328-0802. Tel: (818) 701-5633 10am-10pm PST

**WANTED: TUBES/SS. MCINTOSH, MARANTZ, JBL, EV, DYNA, ALTEC, SEQUERRA, JENSEN, FISHER, LEVINSOHN, CELLO, KLYNE, LINN, QUAD, THORENS, KOETSU, SNELL, ALON, WILSON, ARC, EMT, SME, TANNOY, PS, KLIPSCH, LANGEVIN, WESTERN ELECTRIC, HARTSFIELD, PATRICIAN, 33 LP, ETC. (713) 728-4343 MAURY CORB. FAX: (713) 723-1301. 12325 ASHCROFT, HOUSTON, TX 77035.**

## WANTED TO BUY

**MARANTZ & VINTAGE ERA EQUIPMENT, HIGH-END.** No one pays MORE! (Especially other brands.) N.Y.S.I. (718) 377-7282, 2-6pm, WEEKDAYS.

**WANT — JBL Hartsfield, EV Patrician, Singles OK, McIntosh, Marantz & other tube equipment.** Larry Dupon, 2638 W. Albion, Chicago, IL 60645. (312) 338-1042, evenings.

**WANTED: WESTERN ELECTRIC, JBL, MARANTZ OLD EQUIPMENT.** SUNLIGHT ENGINEERING COMPANY: 310-320-7020, 22130 SOUTH VERMONT AVENUE, #A, TORRANCE, CA 90502.

**WANT: WESTERN ELECTRIC, JBL, JENSEN, EV, HEATH, MARANTZ, EMT, GARRARD 301, THORENS 124, TANNOY OLD EQUIPMENT! HENRY CHANG, 115 SOUTH NICHOLSON AVE., MONTEREY PARK, CA 91755. (818) 307-7372. FAX: 818-288-1471.**

**AUDIO CLASSICS BUYS-SELLS-TRADES-REPAIRS** High End Audio Components. CALL for a quote. See our ad at the beginning of the classifieds. **AUDIO CLASSICS, LTD.**, POB 176WB, Walton, NY 13856. Phone: 607-865-7200. 8AM-5PM EST Mon.-Fri., FAX: 607-865-7222.

**AAAALWAYS PAYING TOP \$\$ FOR CLEAN, COLLECTABLE** McIntOSH TUBE AND SOLID STATE, MARANTZ TUBE, WESTERN ELECTRIC, JBL-PARAGON, HARTSFIELDS, ETC. & ALNICO PARTS. EV PATRICIANS, GEORGIANS & MISC. PARTS. M. LEVINSON, KRELL, ARC, SPECTRAL ETC. CALL ME LAST ONLY WHEN YOU'RE READY TO SELL! JOHN: 1-800-628-0266.

**GUARANTEED 5% MORE** than what my competitors quote you on your Arc, Cello, Krell, Levinson, Spectral, Theta, Threshold, Wadia. CALL ME LAST! **AUDIO CHAMBER** (510) 549-2178, FAX (510) 521-3080 (CA).

**WANTED: MARANTZ TUBE EQUIPMENT, HADLEY, JBL, JENSEN, TRIAX, BROADCAST/THEATER AMPS/SPEAKERS, OUTPUT TRANSFORMERS.** CALL MIKE (800)268-2152.

**TOP \$ FOR: B&W DM7, DM7 MK.2, & 202 B; POLK 5 JR +, 4A; PARADIGM COMPACT MONITOR; PIONEER VSX 5000; YAMAHA DSP 3000, M3S; JVC S5800 VCR, XPA 1010; CARMEN '84 L/DISC; DBX 3BX-DS.** (602)579-3369 OR (210)492-2785.

**COLLECTOR WILL TRAVEL, to pick-up, working or not, MONO/Stereo: tube MARANTZ, McIntosh, TANNOY Spkrs, B&W, B&O, SEQUERRA Tuner, KRELL, Levinson, etc.** (718)387-7316 or (718)383-3205. NEW YORK.

**TUBE HI-FI, CORNER SPEAKERS, THEATER & AUDITORIUM TUBE AMPS,** McIntosh, Altec, RCA, Western Electric, Jensen, Marantz, Heath, Dynaco, Craftsman, Eico, Etc. Sonny 405-737-3212.

## CABLE TV

**CABLE TV DESCRABLERS. SAVE MONEY, DON'T RENT! NOBODY BEATS OUR PRICE! CALL US LAST FOR THE BEST PRICE!! ALL BRANDS 24 HOUR SHIPPING. VCI 1-800-677-0321.**

**CABLE T.V. CONVERTERS: JERROLD, ZENITH, OAK, SCIENTIFIC ATLANTIC, ALL BRANDS AVAILABLE. LINK YOURSELF TO THE FUTURE! VISA, MASTERCARD, C.O.D.'S ACCEPTED. CABLELINX, INC.: 1-800-501-0095.**

## CAR STEREO

"STEREO WORLD" is your discount sound source with great deals on car and home stereo: JVC, Sony, Crunch, Orion, Pioneer, Hi-Fonics, Blaupunkt, Polk, Kenwood, Scosche EFX, JBL, Denon, Infinity and many others. We Carry alarms and a full line of installation kits. Please call or write for current FREE sales flyer. FREE UPS in 48 states. Our 7th year. Visa/MC; COD accepted. P.O. Box 596, Monroe, NY 10950 (914) 782-6044.

## SERVICES

### ACCUPHASE

**AUTHORIZED SERVICE AND PARTS** for all Accuphase products. Contact: ACCUTECH, 206 E. Star of India Lane, Carson, CA 90746. TEL. (310) 324-7406, FAX (310) 324-7422. Hours: 9am-4pm Pacific Time.

## SERVICES

**Audio Equipment Built, Repaired, Modified and Restored** by Richard Modafferi, independent consultant to Audio Classics, Ltd., inventor, and former Senior Engineer at McIntosh. **AUDIO CLASSICS, LTD.** POB 176RTM, Walton, NY 13856. Phone: 607-865-7200 8AM-5PM EST Mon.-Fri., FAX: 607-865-7222.

## PUBLICATIONS

Join **THE AUDIO ADVENTURE**, a monthly newsletter by Tom Miller searching for **GREAT** equipment real people can afford. For information, call: 1-800-566-6617.

**MOVIESOUND NEWSLETTER.** The state of film audio tracks in theaters and at home. \$8/year (4-issues). Send \$2 for two sample issues. P.O. Box 7304, Suite269A, No. Hollywood, CA 91603.

Subscribe to the:

## AUDIO TRADING TIMES

The Smart Way To Buy & Sell  
Pre-owned Equipment Nationwide!  
(Typically well over 1000 items per issue)

Call (715) 479-3103 for more info.

## PARTS AND ACCESSORIES

These  
vacuums  
don't suck.



**GOLD AERO**  
Selected, tested,  
guaranteed.

To receive The Parts Connection 1994 Catalog and a \$10 discount coupon good on your first order over \$100, send \$5 along with your mailing address or call with credit card information.



2790 Brighton Rd, Oakville, Ontario, Canada L6H 5T4  
Toll Free Order Line 1-800-769-0747 (U.S. & Canada)  
Telephone (905) 829-5858 Facsimile (905) 829-5388

MIT MultiCap • Wonder Cap • Kimber Cap • Solo • Solen  
Siemens • Hovland MusiCap • Wima • Holco • Rel-Cap  
Draloric • Vishay • Caddock • Mills • Matsushita • TKD  
Noble • Cardas • Kimber Cable • Discovery • Audioquest  
MIT • ClearAudio • Alps • Bourns • Shalco Attenuators  
Elma • Electroswitch • Nichicon • Gold Aero • RAM  
Mallory • Ruby Tubes • Edison Price • Linear Technology  
Motorola • Analog Devices/PMI • International Rectifier  
MagneQuest • Sonic Frontiers • Pearl • Tube Sockets  
WBT • Neutrik • Curcio Audio Engineering • Kitz

**250 PAGE DESIGN MANUAL AND CATALOG:**  
CHECKOUT OUR KITS: MOSFET Power and 300B  
Triode Amplifiers; Passive, Buffered and Class-A Line-  
stages; PhonoDrives and Active Crossovers. Largest  
Selection of Parts and Supplies including: Kimber Kap,  
MIT MultiCap, Solen, WIMA, Wonder Caps, RAM Labs  
and Golden Dragon Tubes, Kimber Cable, Vampire,  
Cardas, WBT, Neutrik, Caddock, Magnequest™ Output  
Transformers, etc. Send \$10 (U.S./Canada) or \$15 (Inter-  
national). Or call (303) 470-6585, fax (303) 791-5783.  
Visa/MC Accepted. **WELBORNE LABS**, P.O. Box  
260198, Littleton, CO 80126-0198.

## TUBE TRAP

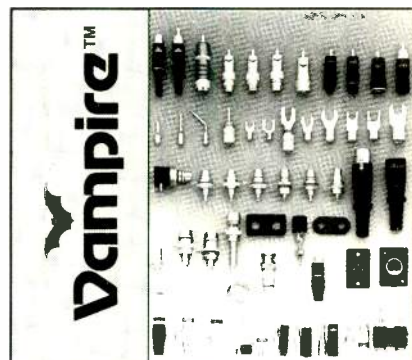
Factory Direct Special

\$228  
Limited Time



**ASC** ACOUSTIC SCIENCES CORPORATION

The Original. The Only Full Range Absorber/Difusor. Improve your audio system dramatically with the new designer series **TOWER TRAP-B**. 100% Satisfaction Guaranteed. 1-800-ASC-TUBE (1-800-272-8823), PST.



...audible results with the finest  
in connecting components!

SOUND CONNECTIONS INTERNATIONAL, INC.  
203 Flagship Dr.—Lutz, FL USA 33549  
PH: 813-948-2707 Fax: 813-948-2907

## Premium Grade Parts

Don't Pay More!

Absolutely the best selection of audiophile grade parts at fair prices! Extensive deep in stock inventory featuring these vendors and many more. Free catalog! MIT MULTICAP, WONDER CAP, SOLEN, SCR, REL-CAP, NICHICON MUSE, BLACK GATE, CADDOCK, VISHAY, MILLS, HOLCO, RESISTA, TDK, ALPS, NOBLE, EAR, DEFLEX PANELS, CARDAS, KIMBER, ACHOTECH, & pure silver chassis wires, HEXFRED diodes, Solo foil inductors, all types of audio connectors, silver contact toggle & rotary switches, stepped attenuator kits, hospital grade plugs, tubes, tools, IC's, super selection of damping materials & feet. International/overseas orders are especially welcome! Phone (415) 669-7181 or fax (415) 669-7558 for a catalog. **Michael Percy, Box 526, Inverness, CA 94937**

## BLANK TAPES

1-800-TAPE WORLD or 1-800-245-6000  
We'll beat any price! 4.95 SHIPPING • FREE CAT.

SONY	MAXELL	TDK	FUJI
DAT-120 7.49	XLI-90 1.79	T-120HS 1.89	T120HQ 1.99
DAT-120 PRO 9.99	XLI-S90 2.29	T-120EHG 2.49	SVHS-T120 6.99
T-120V 2.39	XLI-S100 2.69	SA-90 1.69	8MM-120 3.49
SVHS-T120 7.99	DAT-120 7.99	SAX-90 2.19	HI-8-120 5.99
L-75CHG 3.99	T120HGX 2.79	HI-8-120 5.99	MNI REC74 10.99
MNI REC 74 11.99	JVC-T120 1.79	DAT-120 6.99	DR-1-90 7.99
		DAT-180 8.99	

TAPE WORLD 220 SPRING ST. BUTLER PA 16003 FAX 412-283-8298  
OVER 400 DIFFERENT. SAME DAY SHIPPING. M-F 8-5

**1800' or 2400' AMPEX Reels Used Once—Sample: \$3.00.** New Maxell Reels/Cassettes. AUDIOTAPES, BOX 9584-U, Alexandria, VA. 22304. (703) 370-5555. FREE LIST!

# We Can Think Of 9 Good Reasons To Immunize On Time.

Measles  
Mumps  
Diphtheria  
Tetanus  
Hepatitis B  
Rubella  
Spinal Meningitis  
Pertussis  
Polio

# But You Only Need One.



Immunize On Time.  
Your Baby's  
Counting On You.  
Call 1-800-232-2522



U.S. Department of Health and Human Services

# IT'S A DOG'S LIFE



A few months ago, Sugar sat in a cage at the local humane society, his future far from bright. Today, he has a very bright future ahead of him as he learns to become a Certified Hearing Dog at Dogs For The Deaf, the only national Hearing Dog training and placement service.

For over 16 years, Dogs For The Deaf has been rescuing unwanted dogs from local shelters and training them to become the ears for deaf and hearing impaired people across the country.

Hearing Dogs are trained to alert their partners to sounds vital to independent living: a smoke alarm, a telephone or a knock at the door.

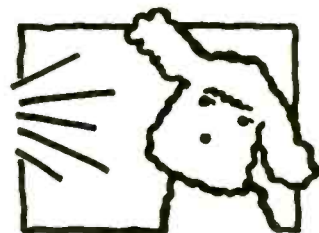
There's no charge for qualified applicants to receive a Hearing Dog, so we depend on you to help us continue this very special program. Only pennies a day helps us save a dog's life and provide veterinary care, training and placement.

Please help us rescue dogs like Sugar and train them to become Hearing Dogs for the deaf. For more information, please call or write:

## Dogs for the Deaf

10175 Wheeler Road  
Central Point, OR 97502

**1-800-990-DOGS**



# AUDIO ANNUAL INDEX

## SUBJECT INDEX

### A.C. POWER

- That Mysterious Source: The A.C. Power Line*, Edward M. Long, June, 34.  
*Power Disturbances*, Susan Owen, June, 38.

### ADDENDA

- Equipment Profile: DGX Audio DDL-1 Loudspeaker and DDA-1 Digital Processing Amplifier* (Nov. 1993, 48), Jan., 8.  
*Equipment Profile: Digital Phase AP-1 Loudspeaker* (Dec. 1993, 66), March, 8.  
*Equipment Profile: NHT Model 3.3 Loudspeaker* (Feb., 49), July, 6.

### BOOK REVIEWS

- Theory and Design of Loudspeaker Enclosures* by J. E. Benson, Jan., 33.  
*Nothing But the Blues*, edited by Lawrence Cohn, July, 16.  
*Audition* by Pierre Buser and Michel Imbert (translated by R. H. Kay), July, 17.  
*Understanding Music with AI: Perspectives on Music Cognition*, edited by Mira Balaban, Kemal Ebcioglu, and Otto Laske, July, 18.  
*Electrostatic Loudspeaker Design and Construction* by Ronald Wagner, Sept., 13.

### CABLES & WIRES

- Auto Speaker Polarity*, Fred E. Davis, June, 40.  
*Speaker Cables: Measurements vs. Psychoacoustic Data*, Edgar Villchur, July, 34.

### CAR STEREO

- Roadsigns* (Dodge Intrepid, Chrysler Concorde, and Eagle Vision with Infinity Spatial Imaging sound system), Ivan Berger, Jan., 38.  
*Roadsigns* (Lexus/Pioneer and Lexus/Nakamichi sound systems), Ivan Berger, Feb., 22.  
*20th Annual Car Stereo Directory*, May, 37.  
*Auto Speaker Polarity*, Fred E. Davis, June, 40.

### DIGITAL TECHNIQUES

- Sound Conditioning Through DSP*, Daniel Sweeney, March, 24.  
*Digital Film Sound: Rated S for Sound*, E. Brad Meyer, June, 44.  
*Currents* (Pioneer CLD-A100 CD/LaserDisc player, with LaserActive game module), John Eargle, Aug., 17.  
*Spectrum* (two-layer optical discs), Ivan Berger, Aug., 20.  
*Digital Radio*, John Gatski, Sept., 34.

- Currents* (video data reduction), John Eargle, Nov., 20.  
*The Audio Interview: Tom Stockham*, Daniel Levitin, Nov., 38.  
*Video CD: A Coding Challenge*, Robert A. Finger, Dec., 38.

### DIRECTORIES

- Car Stereo Directory*, May.  
DCC & MD Players, 37; Ambience & Surround Sound Processors, 38; Amps/Equalizers, 41; Radios/Analog Tape Players, 60; CD Changers & D/A Converters, 69; In-Dash CD Players, 72; Speakers, 75; Company Addresses, 127.  
*Annual Equipment Directory*, October.  
Introduction, 72A; CD Players & Transports, 74; D/A Converters, 84; Amplifiers, 94; Preamplifiers, 128; Tuners, 146; Receivers, 149; Turntables, 158; Tonearms, 160; Phono Cartridges, 162; Headphones, 168; DAT, DCC, & MD Player/Recorders, 174; Analog Cassette Decks, 175; Blank Tapes & Discs, 178; Equalizers, 180; Ambience & Surround Sound Processors, 184; Signal Processors, 190; Crossovers, 192; Loudspeakers, 196; Company Addresses, 320.

### ELECTRICAL NOISE

- That Mysterious Source: The A.C. Power Line*, Edward M. Long, June, 34.  
*Power Disturbances*, Susan Owen, June, 38.

### EMERGING TECHNOLOGIES

- Sound Conditioning Through DSP*, Daniel Sweeney, March, 24.  
*Digital Film Sound: Rated S for Sound*, E. Brad Meyer, June, 44.  
*Spectrum* (AM radio news), Ivan Berger, July, 26.  
*Currents* (Pioneer CLD-A100 CD/LaserDisc player, with LaserActive game module), John Eargle, Aug., 17.  
*Spectrum* (two-layer optical discs), Ivan Berger, Aug., 20.  
*Spectrum* (Dolby Surround Digital), Ivan Berger, Sept., 14.  
*Digital Radio*, John Gatski, Sept., 34.  
*Currents* (video data reduction), John Eargle, Nov., 20.  
*Video CD: A Coding Challenge*, Robert A. Finger, Dec., 38.

### EQUIPMENT PROFILES

- Accuphase DP-90 CD Transport and DC-91 D/A Converter, April, 44.  
Acoustic Research Limited Model 2 Preamplifier, Aug., 42.  
Adcom GFA-5800 Amplifier ("Auricle"), Nov., 92.  
Alpha-Core Goertz MI 1 and MI 2 Speaker Cables ("Auricle"), Aug., 64.  
Alpine 7982 Car CD Changer and Tuner, Nov., 68.  
Altec Lansing AC10 Computer Audio Controller ("Auricle"), Dec., 96.  
Apogee Acoustics Studio Grand Loudspeakers ("Auricle"), July, 58.  
ASC NA-4 Shadow Caster Acoustic Panels ("Auricle"), Sept., 56.  
Audio Alchemy DTI, XDP, and Power Station Two D/A Converter System ("Auricle"), March, 74.  
AudioControl C-101 Series III Equalizer/Analyzer, Aug., 54.  
AudioPrism Iso-Bearing Vibration Absorbers ("PlayBack"), Nov., 128.  
AudioSource Amp One Amplifier, June, 62.  
Ayre V-3 Amplifier, Sept., 38.  
Beyerdynamic IRS 790 Earphones ("Auricle"), May, 32.  
Bib Compact Disc Restorer Polish ("Auricle"), Feb., 68.  
B+C America V-12 Subwoofer and SWA-100 Mono Subwoofer Amplifier, Sept., 54.  
Bryston BP20 Preamplifier, July, 42.  
B & W THX Home Cinema System ("Auricle"), July, 66.  
Cambridge SoundWorks EXO-1 Crossover ("Auricle"), Jan., 102.  
Canon S-35 Loudspeakers ("PlayBack"), Nov., 128.  
Chase Technologies HTS-1 Surround Processor ("PlayBack"), Dec., 144.  
Classé Audio Thirty Preamplifier ("Auricle"), Feb., 70.  
conrad-johnson Premier Twelve Mono Amplifier, Dec., 80.  
Crown SASS-P MKII Stereo PZM Microphone, April, 66.  
Denon Professional Test CDs ("Auricle"), Jan., 108.  
Discwasher CD Stealth CD Cleaning System ("PlayBack"), Dec., 144.  
Dolby Laboratories *Consumer Guide to Home Theatre Videocassette* ("PlayBack"), Dec., 144.  
Electro-Voice N/D 857B Microphone, Dec., 88.

Energy Veritas v1.8 Loudspeaker, Sept., 42.  
 Epos ES11 Loudspeaker, Aug., 48.  
 Fosgate-Audionics Model Four Surround Processor, Jan., 70.  
 GE Superadio III AM/FM Mono Radio ("PlayBack"), Nov., 128.  
 Harman Kardon Festival 500 Music System ("PlayBack"), Nov., 128.  
 Harman Kardon AVR30 A/V Receiver, Dec., 48.  
 JVC XL-G3900 Car CD Player and Receiver, Jan., 78.  
 KEF Q70 Loudspeaker, Dec., 71.  
 Mark Levinson No. 38S Preamplifier ("Auricle"), Dec., 98.  
 Lexicon CP-3 and CP-3 Plus Surround Processors, March, 62.  
 Martin-Logan Aeries Loudspeaker ("Auricle"), Feb., 64.  
 McIntosh MC 1000 Mono Amplifier, Feb., 34.  
 M & K S-5000THX Satellite and MX-5000THX Powered Subwoofer, June, 52.  
 NCT Noisebuster NB-DX Earphones, Sept., 52.  
 NEAR 50Me Loudspeaker, Jan., 58.  
 NHT Model 3.3 Loudspeaker, Feb., 49 (*Advertisement*, July, 6).  
 Onkyo TX-SV515PRO A/V Receiver (*Three \$500 Dolby Pro Logic Receivers*), Jan., 44.  
 Optimus STAV-3400 A/V Receiver, April, 56.  
 Panasonic RQ-DP7 Portable DCC Player, Feb., 42.  
 Panasonic CQ-DC1 Car Tuner/DCC Player, July, 52.  
 Pass Laboratories Aleph 0 Mono Amplifier ("Auricle"), Sept., 58.  
 Pioneer VSX-502 A/V Receiver (*Three \$500 Dolby Pro Logic Receivers*), Jan., 44.  
 Polk Audio LS 90 Loudspeaker ("Auricle"), Feb., 58.  
 PS Audio Reference Link LS Digital Preamplifier ("Auricle"), June, 80.  
 Quad 67 CD Player, March, 46.  
 Rotel RHB-10 Amplifier and RHA-10 Preamplifier ("Auricle"), Jan., 94.  
 Scientific Fidelity Crown Joule Loudspeaker, March, 49.  
 Sentec DiAna D/A Converter ("Auricle"), July, 62.  
 Signet SL280ex Loudspeaker, July, 46.  
 Sonance 2120 Amplifier ("Auricle"), Aug., 60.  
 Sony TCD-D7 Portable DAT Recorder, June, 48.  
 Sony MDS-501 MiniDisc Deck, Nov., 56.  
 Sony MZ-E2 Portable MiniDisc Player, Nov., 64.  
 Soundstream DA-2 Amplifier, Nov., 76.  
 Stax DAC-Talent BD D/A Converter, Nov., 84.  
 Technics SA-GX650 A/V Receiver (*Three \$500 Dolby Pro Logic Receivers*), Jan., 44.  
 Terk Technologies Leapfrog Remote-Control Extender ("Auricle"), Aug., 65.

## SUBJECT INDEX

Theta Digital Cobalt 307 D/A Converter ("Auricle"), Jan., 88.  
 Thiel CS1.5 Loudspeaker ("Auricle"), Nov., 98.  
 TopBox Speaker-Enclosure Computer Program ("Auricle"), June, 74.  
 VMPS FF-1 Loudspeaker ("Auricle"), June, 68.

### HEADPHONES

*Sound Conditioning Through DSP*, Daniel Sweeney, March, 24.

### HISTORY

*Noise Cancellation in the '30s*, Ivan Berger, March, 27.  
*The Audio Interview: Tony Schwartz*, David Lander, March, 34.  
*The Audio Interview: Len Feldman*, David Lander, April, 30.  
*Classic Jazz Remasters: Art Pepper/Brubeck Quartet/Sonny Rollins*, Bruce and Jenny Bartlett, July, 38.  
*The Audio Interview: Bob Weinstock*, James Rozzi, Aug., 30.  
*Currents* (Classic Records' vinyl reissues of RCA Living Stereo LPs), John Eargle, Sept., 20.  
*The Audio Interview: Marc Aubort*, D. W. Fostle, Sept., 26.  
*The Audio Interview: Tom Stockham*, Daniel Levitin, Nov., 38.

### HOME THEATER & SURROUND SOUND

*Three \$500 A/V Receivers: Explosive Value in Home Theater*, Leonard Feldman, Jan., 44.  
*Digital Film Sound: Rated S for Sound*, E. Brad Meyer, June, 44.  
*Spectrum* (Dolby Surround Digital), Ivan Berger, Sept., 14.  
*Planning a Home Theater System: Where Do You Begin?*, William R. Hoffman, Nov., 46.

### INTERVIEWS

*Daniel Lanois*, John Diliberto, Jan., 50.  
*Tony Schwartz*, David Lander, March, 34.  
*Len Feldman*, David Lander, April, 30.  
*Mark Wilder/Classic Jazz Remasters*, Bruce and Jenny Bartlett, July, 38.  
*Bob Weinstock*, James Rozzi, Aug., 30.  
*Marc Aubort*, D. W. Fostle, Sept., 26.  
*Ivor Tiefenbrunn/Mondo Audio*, Ken Kessler, Nov., 16.  
*Tom Stockham*, Daniel Levitin, Nov., 38.

### LISTENING & LISTENING ROOMS

*One Thump or Two: The Advantages of Stereo Subwoofers*, John F. Sehring, Feb., 26.  
*"No, You Don't Have to Turn It Down!"*:

*Soundproofing the Teenager*, Rebecca Day, Feb., 30.

*Sound Conditioning Through DSP*, Daniel Sweeney, March, 24.

*The Best Place for Your Speakers? Your Computer Knows!*, Roy Allison, Aug., 36.

*Planning a Home Theater System: Where Do You Begin?*, William R. Hoffman, Nov., 46.

### LOUDSPEAKERS

*One Thump or Two: The Advantages of Stereo Subwoofers*, John F. Sehring, Feb., 26.

*Sound Conditioning Through DSP*, Daniel Sweeney, March, 24.

*The Best Place for Your Speakers? Your Computer Knows!*, Roy Allison, Aug., 36.

*Planning a Home Theater System: Where Do You Begin?*, William R. Hoffman, Nov., 46.

### MEASUREMENT TECHNIQUES

*That Mysterious Source: The A.C. Power Line*, Edward M. Long, June, 34.

*Power Disturbances*, Susan Owen, June, 38.

*Auto Speaker Polarity*, Fred E. Davis, June, 40.

*Speaker Cables: Measurements vs. Psychoacoustic Data*, Edgar Villchur, July, 34.

*The Best Place for Your Speakers? Your Computer Knows!*, Roy Allison, Aug., 36.

*The Audio Interview: Tom Stockham*, Daniel Levitin, Nov., 38.

*Planning a Home Theater System: Where Do You Begin?*, William R. Hoffman, Nov., 46.

### NOISE REDUCTION

*Sound Conditioning Through DSP*, Daniel Sweeney, March, 24.

*Noise Cancellation in the '30s*, Ivan Berger, March, 27.

*The Audio Interview: Tom Stockham*, Daniel Levitin, Nov., 38.

### OBITUARIES

Herman Burstein, Feb., 10.

Leonard Feldman, April, 6 and 30.

Bart Locanthi, April, 26.

Ralph Hodges, April, 26.

Bert Whyte, June, 4 and 28.

Avery Fisher, June, 30.

### PRO RECORDING

*The Audio Interview: Daniel Lanois*, John Diliberto, Jan., 50.

*The Audio Interview: Tony Schwartz*, David Lander, March, 34.

*Classic Jazz Remasters: Art Pepper/Brubeck Quartet/Sonny Rollins*, Bruce and Jenny Bartlett, July, 38.

*The Audio Interview: Bob Weinstock*, James Rozzi, Aug., 30.

*The Audio Interview: Marc Aubort*, D. W. Fostle, Sept., 26.

*The Audio Interview: Tom Stockham*, Daniel Levitin, Nov., 38.



**PSYCHOACOUSTICS**

*Speaker Cables: Measurements vs. Psychoacoustic Data*, Edgar Villchur, July, 34.

**RADIO**

*Spectrum* (AM radio news), Ivan Berger, July, 26.  
*Digital Radio*, John Gatski, Sept., 34.

**REISSUED RECORDINGS**

*Classic Jazz Remasters: Art Pepper/Brubeck Quartet/Sonny Rollins*, Bruce and Jenny Bartlett, July, 38.  
*Currents* (Classic Records' vinyl reissues of RCA Living Stereo LPs), John Eargle, Sept., 20.

**AUTHOR INDEX**

**Allison, Roy**, *The Best Place for Your Speakers? Your Computer Knows!*, Aug., 36.

**Bartlett, Bruce and Jenny**, *Classic Jazz Remasters: Art Pepper/Brubeck Quartet/Sonny Rollins*, July, 38.

**Berger, Ivan**, *Roadsigns* (Dodge Intrepid, Chrysler Concorde, and Eagle Vision with Infinity Spatial Imaging sound system), Jan., 38; *Roadsigns* (Lexus/Pioneer and Lexus/Nakamichi sound systems), Feb., 22; *Noise Cancellation in the '30s*, March, 27; *Spectrum* (AM radio news), July, 26; *Spectrum* (two-layer optical discs), Aug., 20; *Spectrum* (Dolby Surround Digital), Sept., 14.

**Cameron, David B.**, *Jurassic Tape: How To Be a Good Audio Dino*, April, 38.

**Clegg, Almon H.**, *Coda: Bert Whyte*, June, 30.

**Davis, Fred E.**, *Auto Speaker Polarity*, June, 40.

**Day, Rebecca**, "No, You Don't Have to Turn It Down!": *Soundproofing the Teenager*, Feb., 30.

**Diliberto, John**, *The Audio Interview: Daniel Lanois*, Jan., 50.

**Eargle, John**, *Coda: Bart Locanthi*, April, 26; *Coda: Bert Whyte*, June, 28; *Currents* (Pioneer CLD-A100 CD/LaserDisc player, with LaserActive game module), Aug., 17; *Currents* (Classic Records' vinyl reissues of RCA Living Stereo LPs), Sept., 20; *Currents* (video data reduction), Nov., 20.

**Feldman, Leonard**, *Three \$500 A/V Receivers: Explosive Value in Home Theater*, Jan., 44.

**Finger, Robert A.**, *Video CD: A Coding Challenge*, Dec., 38.

**Fostle, D. W.**, *The Audio Interview: Marc Aubert*, Sept., 26.

**Gatski, John**, *Digital Radio*, Sept., 34.

**Hoffman, William R.**, *Planning a Home Theater System: Where Do You Begin?*, Nov., 46.

**Horstman, Jim**, *Coda: Ralph Hodges*, April, 26.

**Kessler, Ken**, *Mondo Audio* (interview with Ivor Tiefenbrun), Nov., 16.

**Lander, David**, *The Audio Interview: Tony*

**TAPE & TAPE RECORDING**

*The Audio Interview: Tony Schwartz*, David Lander, March, 34.

*Jurassic Tape: How To Be a Good Audio Dino*, David B. Cameron, April, 38.

**THEATER SOUND**

*Digital Film Sound: Rated S for Sound*, E. Brad Meyer, June, 44.

**VIDEO CD**

*Video CD: A Coding Challenge*, Robert A. Finger, Dec., 38.

*Schwartz*, March, 34; *The Audio Interview: Len Feldman*, April, 30; *Coda: Avery Fisher*, June, 30.

**Levitin, Daniel**, *The Audio Interview: Tom Stockham*, Nov., 38.

**Long, Edward M.**, *That Mysterious Source: The A.C. Power Line*, June, 34.

**Meyer, E. Brad**, *Digital Film Sound: Rated S for Sound*, June, 44.

**Owen, Susan**, *Power Disturbances*, June, 38.

**Pitts, Eugene**, *Coda: Herman Burstein*, Feb., 10; *Coda: Len Feldman*, April, 6; *Coda: Bert Whyte*, June, 4.

**Rozzi, James**, *The Audio Interview: Bob Weinstein*, Aug., 30.

**Sehring, John F.**, *One Thump or Two: The Advantages of Stereo Subwoofers*, Feb., 26.

**Sweeney, Daniel**, *Sound Conditioning Through DSP*, March, 24.

**Villchur, Edgar**, *Speaker Cables: Measurements vs. Psychoacoustic Data*, July, 34.

**AUDIO**, December 1994, Volume 78, Number 12. **AUDIO** (ISSN 0004-752X, Dewey Decimal Number 621.381 or 778.5) is published monthly by Hachette Filipacchi Magazines, Inc., a wholly owned subsidiary of Hachette Filipacchi USA, Inc., at 1633 Broadway, New York, N.Y. 10019. Printed in U.S.A. at Dyersburg, Tenn. Distributed by Warner Publisher Services Inc. Second class postage paid at New York, N.Y. 10019 and additional mailing offices. Subscriptions in the United States, \$24.00 for one year, \$42.00 for two years, \$58.00 for three years; other countries except Canada, add \$8.00 per year; in Canada, \$32.00 for one year (includes 7% GST; Canadian GST registration number 126018209). **AUDIO** is a registered trademark of Hachette Filipacchi Magazines, Inc. ©1994, Hachette Filipacchi Magazines, Inc. All rights reserved. The Editor assumes no responsibility for manuscripts, photos, or artwork. The Publisher, at his sole discretion, reserves the right to reject any ad copy he deems inappropriate. **Subscription Service:** Postmaster, please send change of address to **AUDIO**, P.O. Box 52548, Boulder, Colo. 80321-2548. Allow eight weeks for change of address. Include both old and new address and a recent address label. If you have a subscription problem, please write to the above address or call (303) 447-9230. **Back Issues:** For information, write to P.O. Box 7085, Brick, N.J. 08723.

**AD INDEX**

Firm (Reader Service No.)	Page
Acoustic Research (48)	7
Adcom (1)	Cover II & 1
Apogee Acoustics (2)	97
Audiophile Systems/Linn	106
AudioQuest	112
Audio Research (3)	27
Bacardi	Cover IV
Brystonvermont (4)	33
Cambridge SoundWorks (5, 6, 7)	23, 24, 25
Carver (8, 9, 10)	75, 77, 79
Coda Technologies (11)	115
conrad-johnson (12, 13)	47, 51
Crutchfield (14)	17
Dave's	16 a & b
Definitive Technology (15)	36, 37
Denon	83
Digital Phase (16)	29
Energy (17)	*117
Ford Electronics (18)	73
J & R Music World (19)	128
Jack Daniels	35
Jensen	101, 107
KEF (20, 21)	11, 19
Kimber Kable (22)	94
M & K Sound (23)	91
Martin-Logan	Cover III
McIntosh (24)	15
Mobile Fidelity (25, 26)	111, 121
Mondial (27)	5
Monitor Audio (28)	32
Nakamichi (29)	93
NEON (30)	2 & 3
New West Electronics (31)	116
Nobody Beats the Wiz	*144 a-z
Paradigm (32)	53
Parasound	95
Phase Technology (33, 34)	119, 125
Pioneer (35)	99
Pioneer (36)	87
Polyfusion Electronics (37)	21
PSE Speakers (38)	30
Radio Shack	113
Sanus (39)	118
Sennheiser (40)	122
Sheffield Labs (41)	104
Smirnoff	109
Sonic Frontiers (42)	123
Sony	55-70
Sony Music	101, 103, 105, 107
Sound City (43)	127
Southern Comfort	13
Sunfire Corporation (44)	89
Technics	9
The Needle Doctor (45)	126
Thiel	85
Vandersteen (46)	114
Windham Hill	124
XLO Electric	81, *117
Yakov Aronov (47)	18
Yamaha	31

\*Regional Ad

# PlayBack

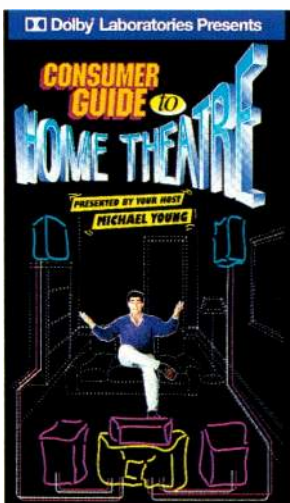
## Dolby Laboratories

### CONSUMER GUIDE TO HOME THEATRE

A 48-minute VHS production with Dolby Surround, this is the first videotape primer on home theater for the consumer. Dolby Laboratories developed the tape to quell confusion about home theater and to prove that it need not be expensive or difficult to install. The cassette may be purchased, for \$19.95, at A/V dealers or video stores or by calling 800/241-4115; some video stores may also rent it.

After a whimsical animation promo, television personality Michael Young appears. First is an introduction to Dolby Surround and Pro Logic; then in "Nuts & Bolts," Young explains how to go about installing, wiring, and setting up a home theater system. Calibration signals are provided on the tape for all channels. Various types and brands of home theater gear are shown, and Young's advice on selecting components is clear, sensible, and accurate. **J.S.**

For literature, circle No. 120



GRADE: B



How does the Chase HTS-1 sound? For music-only surround, I prefer it (used with a rear-channel amplifier) to all but some active surround processors carrying a price tag of approximately \$3,000. When used with a powered subwoofer on Dolby Surround films or TV presentations, certain special effects will not be as spectacular as with an active processor and Dolby Pro Logic; on the other hand, subtler sounds may seem more natural, and the intelligibility of dialog may be improved to the point where you may not require a center-channel speaker at all if you are sitting in line with your screen. **J.S.**

For literature, circle No. 122

GRADE: A+

## DISCWASHER CD STEALTH

### CD CLEANER SYSTEM

Discwasher's Model 1103A CD Stealth motorized CD cleaner (\$28.95) can remove finger grease and other surface contaminants from CDs. To clean a disc, you spray the playing surface (non-label side) with Discwasher CD-1 cleaning solution, place the disc on the platter with the non-label surface up, close the lid, and press the start button on the side of the case. The cleaning cycle takes 14 to 16 seconds. A 6-V d.c. motor rotates the CD and the cleaning pad. The pad has a chamois-like surface that cleans and polishes the CD; it is fastened to the cleaning platter by an adhesive backing and can be replaced when it becomes dirty. There is a compartment on the bottom of the CD Stealth for four AA batteries and the bottle of CD-1 cleaning fluid. You can also operate the CD Stealth from a 6-V d.c. adaptor. I prepared some discs for cleaning by putting some butter on one and some jam on another. The CD Stealth did an excellent job of removing these "toppings" and making the CDs playable again. If you like butter and jam but don't have a lot of bread, the CD Stealth will do a good job of keeping your discs playable. **E.M.L.**



For literature, circle No. 121

## Chase HTS-1 Surround Processor

GRADE: A

Remember the little Dynaco box of about 25 years ago, using the passive Hafler-type circuit to decode rear-channel speaker feeds for surround sound? Well, Chase Technologies' five-channel HTS-1 (\$99) is the same idea, brought up to date in a much more attractive box.

There are no active components and therefore no gain-riding for increased separation, but an interchannel separation of between 25 and 50 dB is claimed. The four speaker outputs on your stereo amplifier are hooked to the four pushbutton terminal inputs of the HTS-1, with the front left and right speakers and the two rear speakers hooked to their respective terminals. The center-channel speaker (if used) must be amplified, and is sourced from a RCA-type jack. If a subwoofer is wanted, it also should be amplified. Line-level outputs allow use with a separate integrated amplifier with tone controls. You might wish to do this to increase rear levels for standard stereo recordings and videos with low levels of ambience information. The tone controls could roll off the top end to approximate the Dolby cutoff at 7 kHz.

"PlayBack" mini-reviews are the result of short, sweet, and sometimes deadly testing by our all-too-experienced editors and writers. These hands-and-ears-only write-ups may look like new product announcements, but the grades and text reflect what the reviewer thought after less than an afternoon's "honeymoon." —E.P.

electrostatic



**MARTIN**  
**LOGANE**  
EST. 1978

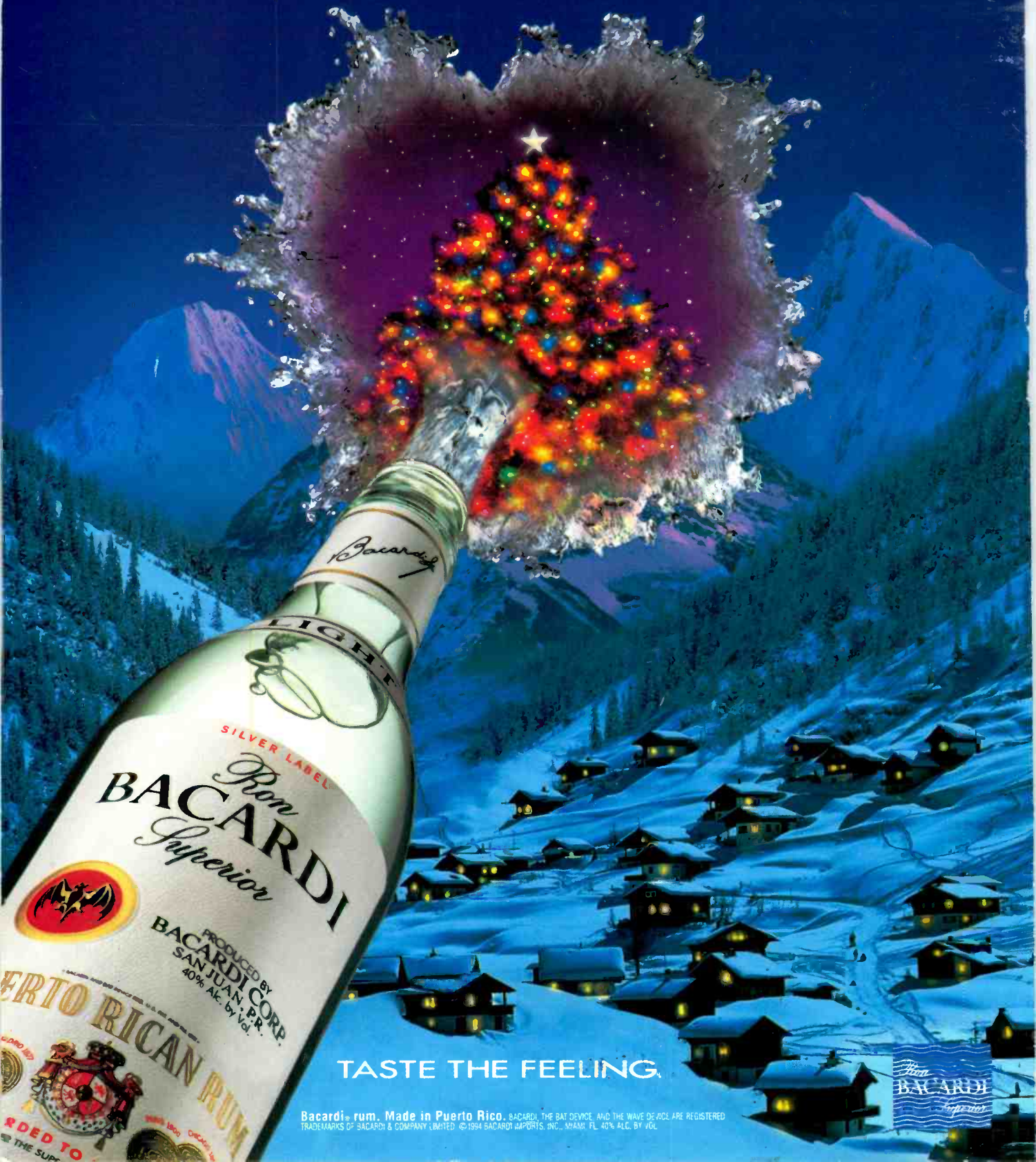
po box 707

lawrence, ks 66044 usa

tel 913-749-0133, fax 913-749-5320

the Aerius, \$1,995.00/pr. oak and bi-wire options available. *biological artifact not included.*

# JUST ADD BACARDI



Bacardi  
LIGHT  
SILVER LABEL  
Ron  
**BACARDI**  
Superior  
PRODUCED BY  
BACARDI CORP.  
SAN JUAN, P.R.  
40% ALC. BY VOL.  
PUERTO RICAN RUM  
REGISTERED TO THE SUP

TASTE THE FEELING.

Bacardi® rum. Made in Puerto Rico. BACARDI, THE BAT DEVICE, AND THE WAVE DEVICE ARE REGISTERED TRADEMARKS OF BACARDI & COMPANY LIMITED. © 1994 BACARDI IMPORTS, INC., MIAMI, FL. 40% ALC. BY VOL.

