

AUDIO

THE EQUIPMENT AUTHORITY

Hot New
Universal
Remotes From
Marantz &
Harman Kardon

SURFING THE WEB FOR AUDIO INFO

TESTED

**Sony's Super
A/V Preamp**

**A Sophisticated
Speaker from JMLab**

**Meridian's
Marvelous
Muscle Amp**



ALSO TESTED

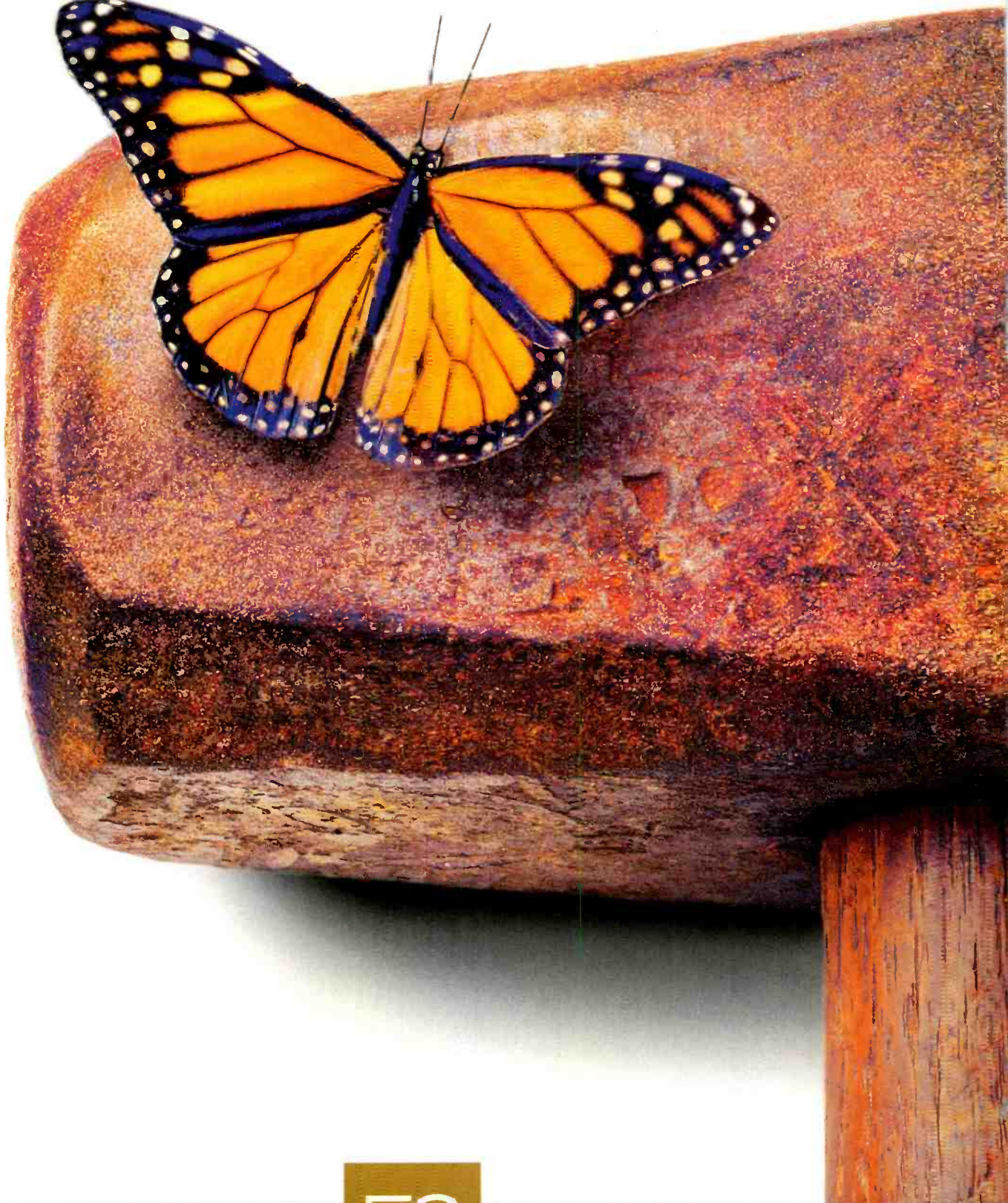
**Adcom CD Player,
Speakers from
Tannoy & Dunlavy,
& More**



299-5508 11 HIGHLAND PARK IL 60055-6637
769 ST JOHNS
BARRY J BOLKA
APR 00
#BKK02695291 5829008
#BXHBBY*XXXX*5-DIGIT 60055

US \$3.99
UK £2.50
CAN \$4.99





©1998 Sony Electronics Inc. Reproduction in whole or in part without written permission is prohibited. All rights reserved. Sony is a trademark of Sony.
Dolby digital is a registered trademark of Dolby Laboratories Licensing Corporation. DTS Digital Surround is a registered trademark of DTS Technology.

ES

SONY ES AND THE DELICATE BALANCE OF POWER.

SONY



There is a new type of power which fully realizes all of the subtlety and force that audio reproduction inspires. It's called The Power of ES - the "Elevated Standard" in high fidelity performance. And it's available only from Sony.

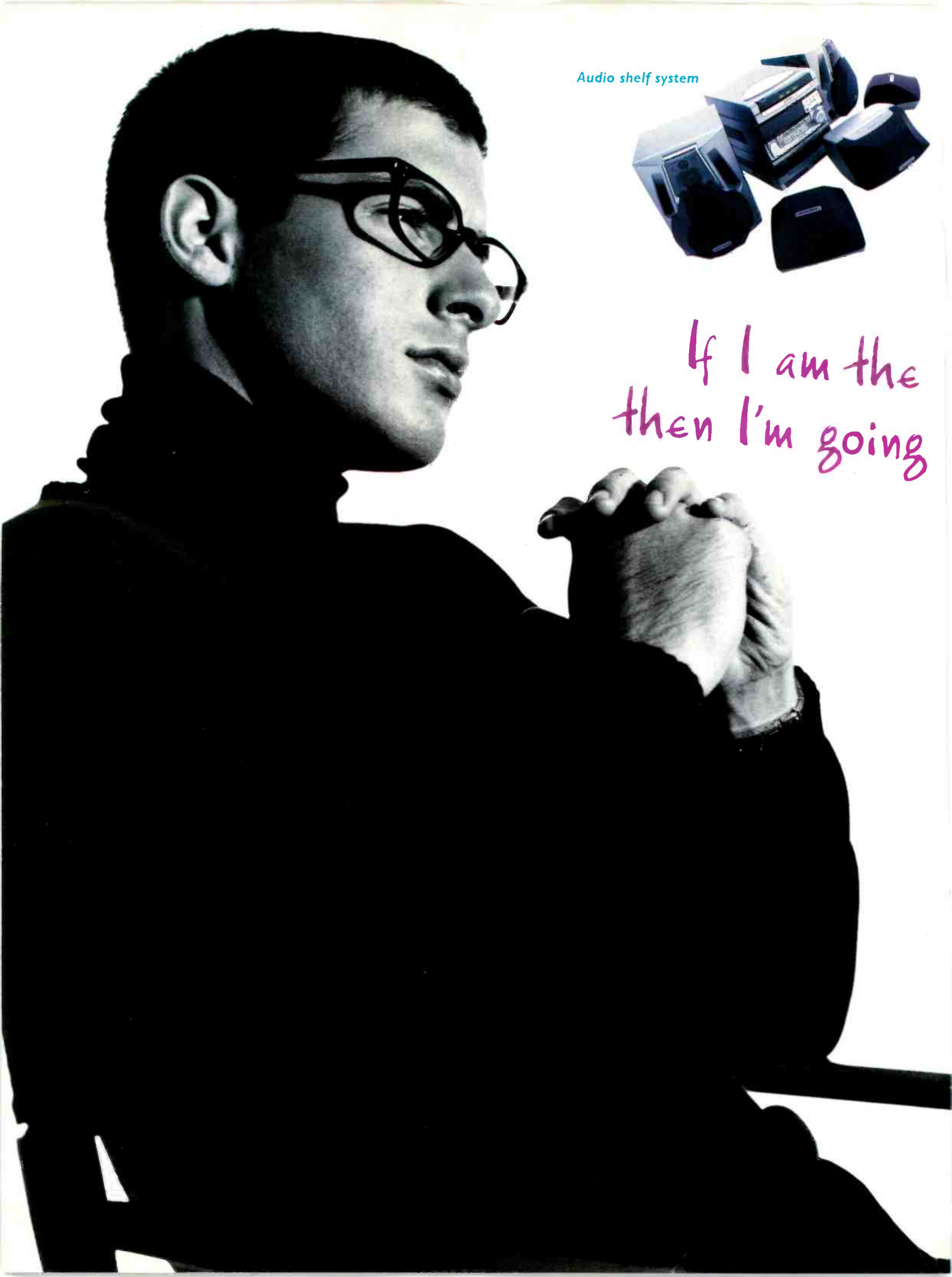
The TA-E9000ES is the world's first preamplifier to utilize the same 32-bit floating decimal point DSP technology found in our finest professional products. Its three separate 32-bit engines can decode Dolby® Digital, DTS® or MPEG 5.1 channel audio, as well as 96kHz / 24-bit PCM stereo.

The Sony TA-E9000...it's the power you want, it's the delicate balance of power you need,
IT'S THE POWER OF ES.

Audio shelf system



If I am the
then I'm going





The Philips CD Collection

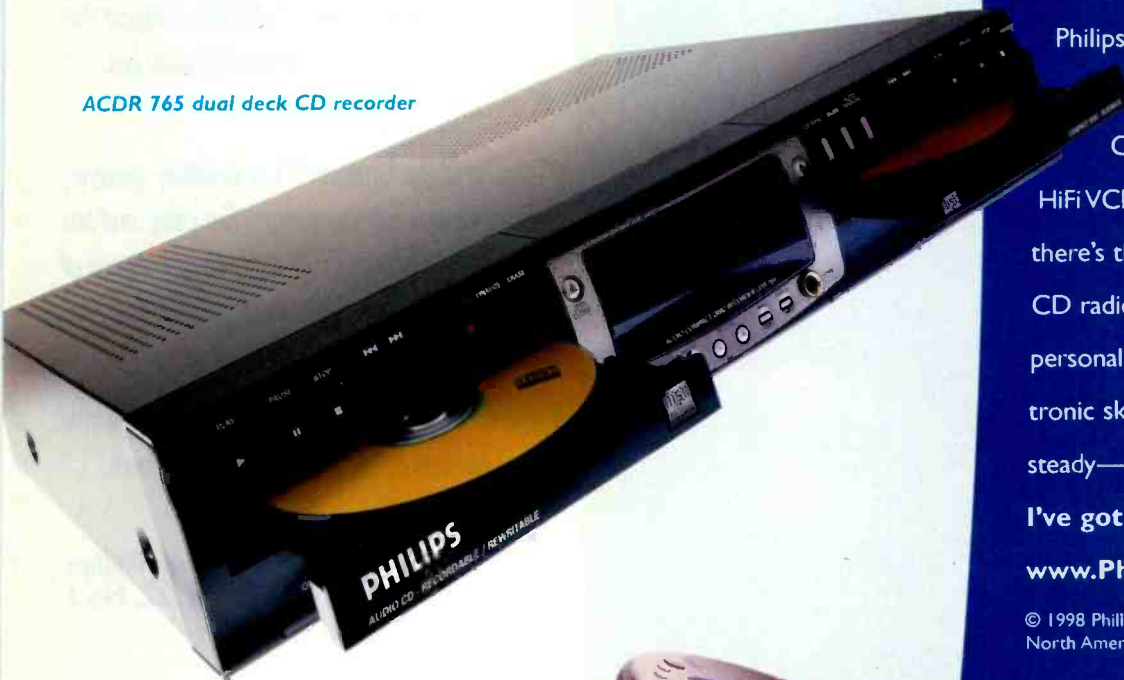
Mix your life and make your own CDs with the Philips ACDR 765 CD recorder—the first dual-deck CD recorder from the inventors of CD technology. Then play your CDs in

CD radio cassette recorder



*director of my own life,
to do the soundtrack too.*

ACDR 765 dual deck CD recorder



five-speaker surround sound with the Philips audio shelf system—a full-featured system with a three-CD changer and direct hook-up to HiFi VCR and TV. For music on the move, there's the big stereo sound of the Philips CD radio cassette recorder and the Philips personal CD player with 45-second electronic skip protection, so your music stays steady—even when you aren't.

I've got to admit it's getting better.

www.PhilipsUSA.com

© 1998 Philips Electronics North America Corp.



Personal CD player



PHILIPS

Let's make things better.



Nautilus™ 800 Series

The Legend Lives. Again.

... "the Nautilus 801's never sounded less than fantastic in my system."

... "It had clarity and tonal truth that I've heard very few speakers match..."

... "the same sort of effortless imaging that a small monitor has..."

... "The Nautilus 801 is incredibly dynamic, images and soundstages like crazy, and has that special magic that marks it as one of the great loudspeakers..."

... "This was probably the closest I'll ever come to having Dylan in my living room..."

Wes Phillips
Stereophile Vol. 22, No 1

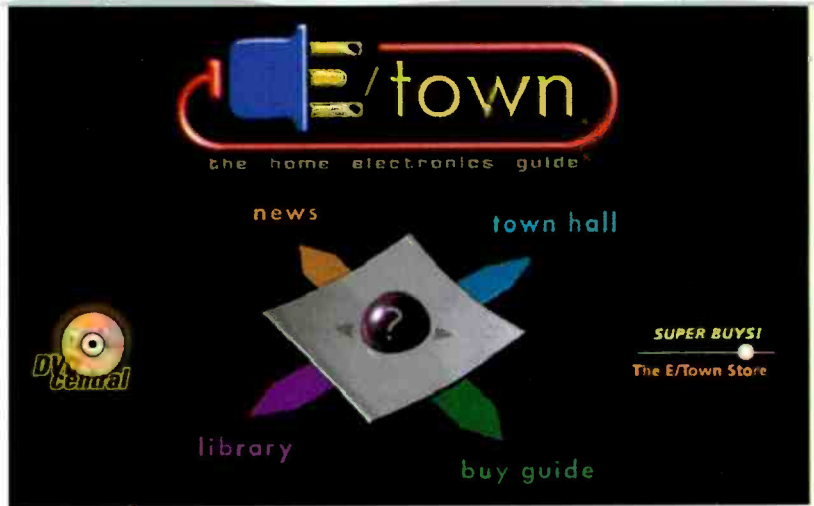


B&W Loudspeakers of America
54 Concord Street
N. Reading, MA 01864
Tel. 978.664.2870
Fax 978.664.4109
<http://www.bwspeakers.com>

LISTEN AND YOU'LL SEE

AUDIO

THE EQUIPMENT AUTHORITY



Web Sites, page 28

FEATURES

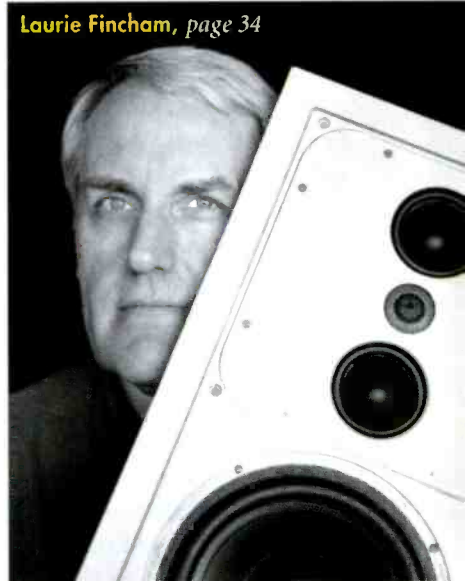
- AUDIO SITE-SEEING ON THE WEB Gordon Brockhouse 28
- THE AUDIO INTERVIEW:
LAURIE FINCHAM OF THX David Lander 34

EQUIPMENT PROFILES

- SONY TA-E9000ES A/V PREAMP Edward J. Foster. 40
- JMLab COBALT 820 SPEAKER D. B. Keele, Jr. 49
- MERIDIAN 557 AMPLIFIER Daniel Kumin. 57

AURICLES

- TANNOY CHURCHILL SPEAKER
Bascom H. King. 63
- ADCOM GCD-750 CD PLAYER
Anthony H. Cordesman 66
- DUNLAVY AUDIO LABS
SC-V SPEAKER
Anthony H. Cordesman 69



Laurie Fincham, page 34

PLAYBACK

- CAMBRIDGE SOUNDWORKS
DESKTOP THEATER 5.1,
FOSTEX CR-200 CD RECORDER,
AND WYETECH TOPAZ 211A
SINGLE-ENDED TUBE AMP. . . 88

DEPARTMENTS

- FAST FORE-WORD Michael Riggs 6
- LETTERS. 8
- WHAT'S NEW 10
- SPECTRUM Ivan Berger. 15
- MONDO AUDIO Ken Kessler 19
- FRONT ROW Corey Greenberg. 23

RECORDINGS

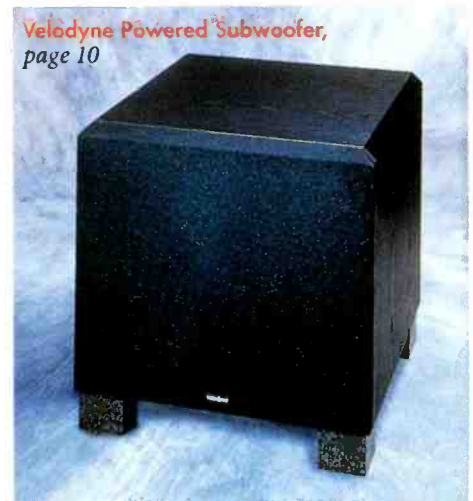
- CLASSICAL 72
- JAZZ & BLUES 75
- DVD 78

Cover Photographer: Bill Kouirinis Studio
Cover Equipment: JMLab Cobalt 820 speaker, Meridian 557 amp, and Sony TA-E9000ES A/V preamp

Audio Publishing, Editorial, and Advertising Offices,
1633 Broadway, New York, N.Y. 10019
Editorial E-Mail: audiomag@aol.com

Subscription Inquiries:
Phone, 303/604-1464; fax, 303/604-7455;
e-mail, hachette@neodata.com (must include
magazine title, your name, and old and new addresses)

Marantz Remote,
page 23



Velodyne Powered Subwoofer,
page 10

Although I go to the Consumer Electronics Show every January expecting to see new things, I seldom anticipate there will be any real surprises. That's because products and technologies typically are pre-announced in some way and because so much follows a natural, more or less predictable progression. But this year was different.

What was the surprise? Amazingly, not anything digital, except that it would be hard to do without computers to help with the necessary engineering calculations. It's a new approach to loudspeaker enclosure design, called Parametric Acoustic Modeling (PAM), that is said to yield a number of remarkable advantages over the now well-worn Thiele-Small method. Basically, there are five benefits: about 4 to 5 dB higher efficiency, very low distortion, precise control of frequency response, control of group delay independent of frequency response, and the ability to make group delay very low.

Of all of those, I would have expected the efficiency gain to be the most important, but after a demonstration I came away convinced that the most exciting thing about PAM is actually the lower group delay and distortion. For the first time in my life, I heard a recording of a drum kit sound close to the real thing.

The demonstration took place in a hotel suite of an Australian company, Whise, which developed PAM and several products based on it, and by its U.S. licensor and distributor, TMH Corporation. TMH stands for Tomlinson M. Holman, and Tom was on hand to make introductions and help with the demonstration and explanations. The Whise subwoofers are the first products to carry TMH certification, a program aimed at finding important new audio technologies and qualifying their performance for consumers.

The man who actually developed PAM also was there. Graeme Huon, ironically, is a protégé of Neville Thiele. He points out that at the time Thiele and Small

developed their ground-breaking analysis, there were two paths they could have taken: a lumped-parameter model or a distributed-parameter model. They chose lumped-parameter, perhaps largely because it is simpler computationally. In an era when people routinely have on their desktops more computing power than entire companies did 20 years ago, that's far less of an issue. Huon eventually went back and took the other road, developing a distributed-parameter model.

I won't attempt to explain PAM because I don't really understand it yet. But I can tell you that the inside of a PAM-designed speaker enclosure looks rather different from anything you've probably seen before. Sound travels through channels of various lengths and widths, which form acoustic impedances. It is the choice of those impedances that determines frequency and phase response—as noted above, independent of one another, which has never before been possible without electronic intervention.

PAM-designed enclosures exhibit the same rolloff slope below cutoff as conventional ported speakers, yet they can exhibit less group delay than equivalent sealed systems. At least that's the claim. If it proves true, it is quite an achievement and will surely change speaker design forever, just as the Thiele-Small system did when it was introduced.

The reason for the efficiency increase, by the way, is that PAM-designed enclosures incorporate no damping and thus throw away no energy. That, all by itself, will take a while for everyone to get used to.

You can find more information on PAM at the following Web sites:
www.precisionaudio.com.au and
www.whise.com.au.



AUDIO

EDITOR-IN-CHIEF

Michael Riggs

ART DIRECTOR

Cathy Cacchione

ASSOCIATE ART DIRECTOR

Linda Zerella

TECHNICAL EDITOR

Ivan Berger

SENIOR EDITOR

Alan Lofft

MANAGING EDITOR

Kay Blumenthal

MUSIC EDITOR

Douglas Hyde

ASSOCIATE MANAGING EDITOR

Scott Van Camp

ASSISTANT MANAGING EDITOR

Warren L. Meislin

EDITORIAL ASSISTANT

Michael Raz

EDITOR-AT-LARGE

Corey Greenberg

SENIOR CONTRIBUTING EDITORS

Edward J. Foster, D. B. Keele, Jr., Buscom H. King

David Lander, Edward M. Long

CONTRIBUTING EDITORS/ARTISTS

Rad Bennett, David L. Clark, Anthony H. Cordesman

Ted Costa, John Diliberto, John Eargle

John Gatski, Joseph Giovanelli, Dawn Joniec

Ken Kessler, Daniel Kumin, Robert Long, Paul Moor

John Sumier, Michael Tearson, Jon & Sally Tiven

V.P./GROUP PUBLISHER

Tony Catalano 212/767-6061

V.P./PUBLISHER

Scott Constantine 212/767-6346

GENERAL MANAGER *Greg Roperti*

BUSINESS MANAGER *Sal Del Giudice*

PRODUCTION DIRECTOR *Michael Esposito*

PRODUCTION MANAGER *Lynn O. Scaglione*

SR. PRODUCTION ASSISTANT *Eugenia Slubski*

DIRECTOR OF MARKETING *Rob Sabin*

PROMOTION MANAGER *Adele Ferraioli-Kalter*

OFFICE MANAGER *Maria Coppola*

OPERATIONS MGR./AD COORDINATOR *Linda Neuweiler*

SUBSCRIPTION DIRECTOR *John Dagny*

NEWSSTAND SALES DIRECTOR *Megau Jenkins*

DIR. OF CIRCULATION SERVICES *Rocco P. Chiappetta*

ADVERTISING

REGIONAL ACCOUNT MANAGERS

Jerry Stoeckigt 312/923-4804

Paul C. Smith 212/767-6077

Gabrielle DiFolco 212/767-6063

REGIONAL V.P./AD DIRECTOR, WEST COAST

Bob Meth 323/954-4831

NATIONAL RECORD LABEL SALES

MAG Inc. Mitch Herskowitz 212/490-1715

CLASSIFIED ADVERTISING

800/445-6066

GLOBAL ADVERTISING

V.P., Aude de Rose 212/767-6369



CHAIRMAN

Daniel Filipacchi

PRESIDENT AND CEO

David J. Pecker

SR. EXECUTIVE V.P. AND EDITORIAL DIRECTOR

Jean-Louis Gimbire

EXECUTIVE V.P. AND COO *John Fennell*

PRESIDENT, HACHETTE FILIPACCHI NEW MEDIA

James P. Docherty

SR. V.P./DIR., CORP. SALES *Nicholas J. Matarazzo*

SR. V.P./CFO & TREASURER *John T. O'Connor*

SR. V.P./MFG. & DISTRIBUTION *Anthony R. Romano*

SR. V.P./GENERAL COUNSEL AND SECRETARY

Catherine Flickinger

V.P., CIRCULATION *David W. Leckey*

V.P., COMMUNICATIONS & SPECIAL PROJECTS

Keith Estabrook

V.P., CORPORATE COMPLIANCE *Carlo A. Boccia*

V.P., BUSINESS DEVELOPEMENT *Raymond Dreyfus*

561

Meridian Digital Surround Controller

The all New 561 features

Decode 8 channels including side speakers for all modes
12 different user definable presets
3 subwoofer outputs with variable crossovers for music or film with overload protection
DSP tone controls
2 - room system capability
Expansion module for conversion of analogue and digital sources to second zone

Meridian Proprietary Music Processing

Trifield, Ambisonic, Super Stereo, Music Logic
Meridian Lossless (MLP), Mono, Stereo, Music

Meridian Award winning Movie and TV Processing

Dolby-AC3, DTS, MPEG Surround, Dolby ProLogic, THX Cinema, Academy

Easy but flexible setup

Easy setup from the front panel or via a PC.
Setup via On Screen Display in Composite and S-Video.
RS232 link for flexible setup, system integration and software updates
Two trigger outputs

Audio Inputs and Outputs

7 analogue adjustable inputs
1 Digital optical input (Toslink)
5 Digital co-axial inputs IEC 1937, IEC 958
modular design for future 96kHz/24bit inputs
6 analogue output channels
8 digital output channels (Meridian Digital Theatre)
2 analogue output channels (Tape and Zone 2)
1 digital output (Tape and Zone 2)

Video Inputs and Outputs

4 composite inputs
4 S-Video inputs
S-Video to composite conversion, On-screen display for user and setup on both Main and Tape outputs for composite and S-video

Suggested list price \$4995US

**Meridian's amazing new
561 surround controller.
At this price,
what did we leave out?**

Absolutely nothing!

BOOTHROYD STUART
©
MERIDIAN

Meridian America Inc
3800 Camp Creek Parkway
Building 2400, Suite 122
Atlanta GA 30331
Tel (404) 344-7111
Fax (404) 346-7111

Meridian in Canada
Aralex Acoustics Ltd
106-42 Fawcett Rd, Coquitlam,
BC V3K 6X9
Tel (604) 528 8965
Fax (604) 527 3886

<http://www.meridian-audio.com>

A Call for Help

My friend James Bongiorno, one of the founding fathers of modern solid-state circuit design, has a liver tumor as the result of getting hepatitis C from contaminated blood during surgery. Fortunately, his doctors believe that it has been detected very early and that it's 100% curable by further surgery. Chemotherapy will be virtually mandatory, to dramatically reduce the viral load and prevent recurrence of the tumor and progression of cirrhosis.

Needless to say, these medical procedures must be undertaken as soon as possible. However, because of his two previous liver operations, James has been unable to acquire insurance coverage. Therefore, a medical trust in his name has been established at: Montecito Bank and Trust, 1000 State St., Santa Barbara, Cal. 93101; Attention: Ms. Krissi Wray, Service Manager (805/564-

0220). Contributions will be greatly appreciated.—*Bascom H. King*

Hold onto Yer Jocularly, Corey

In her letter in your November 1998 issue ("Going Too Far?"), Janice Mancuso pointed out that Corey Greenberg's July 1998 "Front Row" column contained (in addition to the title "Hum Job") the word "mofo," which offended her. Greenberg's November review of the JBL HLS610 speaker raises the ante even further. In addition to the pubescent phrase "Hold onto yer jock. . ." he takes the opportunity (that *Audio* gives him) to take the name of the Lord in vain twice. I wonder what percentage of your readership is Christian.

Having grown up in the '60s and '70s, I like to think that I'm far from being a prude. However, my early amusement at Greenberg's youthful, anti-establishment antics

has waned. I happen to be an acquaintance of one of your "respectable" reviewers, and I suspect that Greenberg is a source of embarrassment to him. I know a couple of folks at JBL who are also likely to take offense at the use of locker-room dialect associated with their product.

Greenberg needs to work on his literary skills without the crutch of substandard English. And *Audio* needs to consider its audience more carefully. You didn't find this type of trash in the 1947 editions, when the magazine was basically for engineers only, who were, at that time, virtually all male (better suited to locker-room jive).

*Name withheld
via e-mail*

Measuring Up

I would like to know where D. B. Keele, Jr. found an amplifier that will put out 10,000 watts ("Equipment Profile," Snell E.5 Speaker, September 1998). I know of only one amp that claims this feat. It runs on three-phase power and is manufactured by Crown under a different brand name. How is such a power output measured? Can a digital storage oscil-

The new Classé CAP-80 and CDP.3

- 2x 100 w/ch. into 8Ω
- full function remote
100% symmetrical
circuitry
- preamp output
- high current capability
- modular construction
- digital volume readout
- balanced input
- solid aluminum machined
remote control

Integrated amplifier CAP-80



CD player CDP.3



Perfect match for the CAP-80:

- dual 20 bit PCM 1702 DAC's
- HDCD filter
- single-ended and balanced outputs
- 75Ω SP/DIF digital out
- solid aluminum machined remote control

Classé

5070 François-Cusson, Lachine, Quebec, Canada H8T 1B3
Tel.: (514) 636-6384 • Fax: (514) 636-1428 • www.classeaudio.com

oscope be used to capture peak output voltage waveforms and then measure current into the same system and multiply the two? How can one measure peak output accurately? I would like to know of more sources of information on these types of measurements.

*Jeremy Johnston
via e-mail*

Author's Reply: Coincidentally, the amplifier that I am using is a Crown Macro Reference rated at a continuous output of 760 watts per channel, both channels operating into an 8-ohm load. Although it does not operate on three-phase power, its power cord is 3/4 inch in diameter!

So where does the much higher, 10,000-watt, power rating cited in some of my speaker reviews come from? The higher cited power results from a combination of several factors:

1. The power quoted in my reviews is a peak rating, which effectively doubles the power rating of the amplifier. (My amp increases to about 1,500 watts, peak.)

2. The test amp is operated in its bridged mono mode, which effectively quadruples output because it doubles the amp's output voltage swing. (My amp power increases to about 6,000 watts.)

3. The power cited is a short-term rating based on using a shaped tone-burst test signal whose crest factor is high. An amplifier's short-term output power is always higher than its continuous power because its power supply does not produce any sag. (For my amp, the burst rating on this waveform is about 8,000 watts, which corresponds to swinging 250 volts into an 8-ohm load.)

4. The power is calculated by knowing the applied voltage and the rated impedance of the loudspeaker. The measured peak voltage is squared, and the result is then divided by the rated impedance (not multiplied by the instantaneous voltage and current). This is called the apparent peak power input (rather than the actual peak power input). Why is it done this way? First, it's simpler. You only have to measure peak voltages. Second, it conforms to the way power is calculated in many standards for rating speaker power-handling capability. And third, it's the logical way to do it because speakers, regardless of their impedance variations, are designed to be driven by constant-voltage sources. Because a

speaker's actual impedance is often much higher than its rated impedance, especially at middle and high frequencies, the calculated apparent input power is significantly higher than the actual input power because the amplifier can generate higher voltages into the higher-impedance load.

As for how to accurately assess peak levels, the peak output voltage of a power amplifier may be measured with an oscilloscope or an instantaneous peak-reading AC voltmeter. (A very rare commodity! None of the handheld digital voltmeters that I know

of have this feature.) As a substitute for a peak-reading AC voltmeter, I have created a passive rectifier circuit to be used with a DVM that captures and holds a power amp's peak voltage values.

Peak output sound-pressure level is ideally measured with an instantaneous peak-reading sound level meter or an equivalent, such as some devices made by B&K Instruments. If you can't get one of these, use a calibrated microphone, preamplifier, and oscilloscope (or an instantaneous peak-reading AC meter).—D.B.K.

Rediscover Your Music!

Model 1
"Affordable excellence."

Model 2
"The high-fidelity standard."

Model 3
"Superior detail and resolution." *

Model 5
"The ULTIMATE embodiment of the VANDERSTEEN boxless design."
* cut-away view

Model 2W
"The amplified subwoofer that rocks the foundation." *

VCC
"Ultimate center channel realism." *

VSM
"The ideal wall-mount surround speaker."

For more than 20 years, VANDERSTEEN AUDIO has built innovative phase-correct loudspeakers true to both science and music. To experience the extraordinary value and incredible realism of boxless dynamic speakers in a stereo, multi-channel or home theater system, audition the legendary VANDERSTEEN speakers at your nearest carefully selected dealer.

VANDERSTEEN AUDIO

DIMENSIONAL PURITY 116 West Fourth St, Hanford, CA 93230

Please call or write for complete information and the name of your nearest dealer.

(209) 582-0324

www.vandersteen.com

What's New

Klipsch Home Theater Speakers



Klipsch's Quintet Micro Theater System's satellite and center-channel speakers are made of Stone Mineral Compound, which the company says provides superior damping of resonances. Each has a MicroTratrix horn integrated into its front baffle to minimize diffraction. Sensitivity is rated at

90 dB at 1 watt/1 meter. The Quintet's subwoofer is powered by an internal 100-watt amp, has a frequency response rated at 34 to 120 Hz, ± 3 dB, and will turn on or off automatically. The sub also has variable crossovers, and its polarity is adjustable. System price: \$899. (Klipsch, 800/554-7724)



POLK SURROUND SPEAKER

Designed to produce enveloping surround effects in discrete digital surround applications, the f/x500 has

two 1-inch trilaminate dome tweeters mounted on opposing baffles set at a 45° angle. You can switch between bipolar and dipolar radiation patterns to suit your installation. The

f/x500's 6½-inch woofer and dual 1-inch tweeters are said to be capable of wide bandwidth and robust power handling. Price: \$550 per pair, in black or white. (Polk Audio, 800/377-7655)

An internal amp rated at 250 watts powers the VA-1250X, which uses a 12-inch forward-firing driver and a 15-inch downward-firing passive radiator to achieve low-frequency response that Velodyne says extends down to 22 Hz. A current-sensing servo system monitors and adjusts the woofer's drive signal to reduce distortion.

There's also a switch for bypassing the VA-1250X's internal crossovers for direct connection to Dolby Digital (AC-3) processors and

VELODYNE

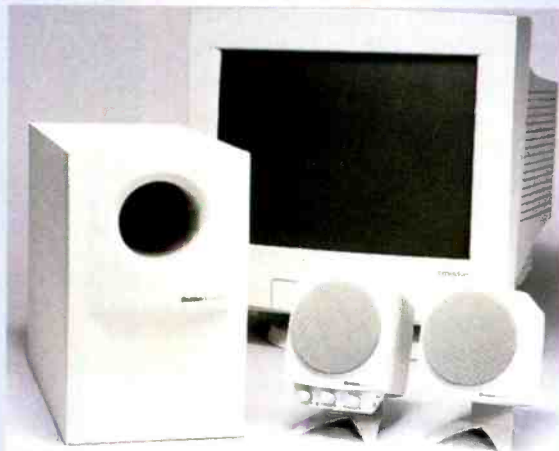


POWERED SUBWOOFER

receivers. The subwoofer's remaining controls are for volume, phase, and auto on/off. Price: \$999.

(Velodyne, 408/436-7270)

BOSTON ACOUSTICS



POWERED SUB/SAT SYSTEM

Inside the MediaTheater's shielded bandpass subwoofer is a 6½-inch driver, a four-channel amp, and a Dolby Pro Logic Virtual Surround decoder. Each magnetically shielded satellite has a 3½-inch driver. Controls include on/off/volume, surround level, and subwoofer level/test signal.

With Dolby-encoded sources, the MediaTheater yields left, phantom center, right, and virtual surround images. A bypass switch selects normal stereo playback. System frequency response is rated at 50 Hz to 20 kHz, ± 3 dB. System price: \$299.95. (Boston Acoustics, 978/538-5000)

What's New



Stoner Pressurized Cleaner

This product is said to be ideal for cleaning dust from portable CD and cassette players, portable DATs, camcorders, VCRs, and other audio and video components. Gust Air Duster's colorless, odorless pressurized propellant, says Stoner, will not deplete the ozone layer. Each Gust cleaning kit includes three 15-ounce cans of Gust and one can of Xenit glass cleaner. Price: \$19.95 plus \$4.50 for shipping. (Stoner, 888/786-6375)

NAKAMICHI CAR TUNER/PREAMP/ CD CHANGER



Nakamichi's MB-100, said to be the world's first high-end in-dash six-CD changer mechanism, also houses a 30-preset AM/FM tuner and a control array in its DIN-sized chassis. A second chassis houses a 24-bit D/A converter, an Acoustic Response Compensator (which fine-tunes

spectral balance), and a preamp. It has four inputs—two coaxial digital and two analog—to facilitate system expansion. In addition, the CD changer/tuner's control panel is detachable, and a wireless remote control is included. Price: \$1,000. (Nakamichi, 310/538-8150)

Knöll 12-Channel Power Amp



Intended for home theaters and custom installations, the MR1250 has 12 channels, each rated at 50 watts continuous output, with peak capability said to reach 100 watts per channel. An external voltage trigger can turn the amp on or off, and self-resetting circuitry

protects each channel from over/under-voltage, overload, short circuits, and thermal runaway. Frequency response is 10 Hz to 40 kHz, ± 1 dB. The amp has a level control, an RCA input, and five-way binding posts for each channel. Price: \$949. (Knöll Systems, 604/272-4555)

ROTEL A/V RECEIVER



Each of the RSX-965's five internal amps is rated to deliver 75 watts into 8 ohms, all channels driven, from 20 Hz to 20 kHz, at 0.05% THD. Dolby Digital decoding is handled by a Crystal Semiconductor chip, DTS by a Motorola chip. All five A/V inputs have S-video and

composite connectors. There are four digital inputs, two optical and two coaxial. The Rotel also has two tape monitors, a 30-preset tuner, an MM phono input, and a backlit remote that enables programming command macros. Price: \$1,199.90. (Rotel, 800/370-3741)



M & K POWERED SUBWOOFER

M&K says that despite its diminutive footprint of less than 1 square foot, the VX-100's in-room deep-bass response is flat to below 20 Hz. An internal 100-watt amplifier powers an 8-inch long-throw driver. The low-pass filter, adjustable from 50 to

125 Hz, can be bypassed to accept the subwoofer output of Dolby Digital and DTS processors directly. The sub's cabinet, available in a black or white lacquer bead finish, measures 12 x 14½ x 11 inches. Price: \$795. (M&K, 310/204-2854)

What's New



Proton A/V Preamp/Processor

The AS-2620's Dolby Digital (AC-3) and Dolby Pro Logic processing can be monitored via its on-screen display and adjusted with its remote control. There are five analog A/V inputs and four digital inputs (two coaxial, one

optical, and one AC-3 RF for laserdisc players). The volume control has a range of 85 dB, adjustable in 1-dB increments, and you can vary the six individual channel levels over a range of ± 9 dB. Price: \$999. (Proton, 562/404-2222)



JOB D/A CONVERTER

The Job D/A converter, which features three switchable digital inputs (balanced XLR, coaxial S/P DIF, and optical Toslink), uses Alize technology licensed from Goldmund in Europe. Alize is said to deliver

exceptional performance: distortion of 0.001% and time error across the bandwidth of less than 100 picoseconds. This D/A converter will accept digital signals of up to 24 bits. Price: \$1,250. (Job Electronics, 805/530-0052)

LEXICON DIGITAL SURROUND PROCESSOR

Available in Home THX, Dolby Digital, and DTS versions, the DC-2 has a variety of proprietary surround and enhanced ambience modes, including 7.1-channel output capability. Lexicon says the DC-2's refined 24-bit delta-sigma D/A converters in all eight channels yield sound rivaling that of esoteric, stand-alone

two-channel D/A converters. Features include five video inputs (S-video and composite video), eight digital inputs, and low-frequency enhancement algorithms derived from psychoacoustic research. Prices: DC-2/THX, \$2,495; DC-2/AC-3, \$3,495; DC-2/DTS, \$3,995. (Lexicon, 781/280-0300)



SOUND APPLICATION AC POWER CONDITIONER

Equipped with six duplex AC receptacles (totaling 12 outlets), the CF-2 is said to suppress electromagnetic and radio-frequency noise by as much as 60 dB across a 1-GHz bandwidth. Though it uses no current-limiting devices, the CF-2 provides

10-stage protection from electrical surges and spikes. Features include a machined aluminum case, a 20-ampere IEC input, and an internal Carlingswitch magnetic circuit breaker. Price: \$3,000. (Sound Application, 510/525-1065)

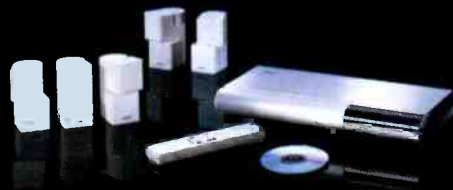


Rogue Audio Mono Amp

Besides the ability to operate in pure triode or Ultra-Linear mode, the M-120 monoblock amp uses matched octets of KT88/6550 output tubes. Each amp is rated at 120 watts at 1% THD; typical THD is said to be less than 0.1%. The M-120 has an

ultrawide-bandwidth output transformer with 4- and 8-ohm taps; frequency response is cited as 5 Hz to 50 kHz, ± 1 dB. The amp's slow-start, logical, power-on circuit is said to extend tube life. Price: \$2,595 per pair. (Rogue Audio, 610/760-1621)

DO YOU CELEBRATE CREATIVITY?



LIFESTYLE®

HOME THEATER

SYSTEMS

Creativity comes from a willingness to be different and the technology to make it work. Lifestyle® systems represent a fundamentally different approach to audio, engineered to be the best sounding, easiest to use home theater systems ever. One listen and you'll understand why *Stereo Review* said we had "A decidedly different world view."^{*}

ZONE1

LIFESTYLE MUSIC SYSTEM

102.5
FM STEREO

BOSE
Better sound through research®

1.800.444.BOSE

Please Ask For Ext. 642

For information on all our products:
www.bose.com/lifestyle

Higher I.Q.

IRIQ.

The IRQ Intelligent Remote by MADRIGAL and **Microsoft**

For universal remote controls, higher intelligence should mean higher performance. With Madrigal's IRQ, the intelligence of the remote is used to organize and simplify its operation. It is so simple to use that every member of your family—whether you like it or not—can master the complexities of a complete home theater system.

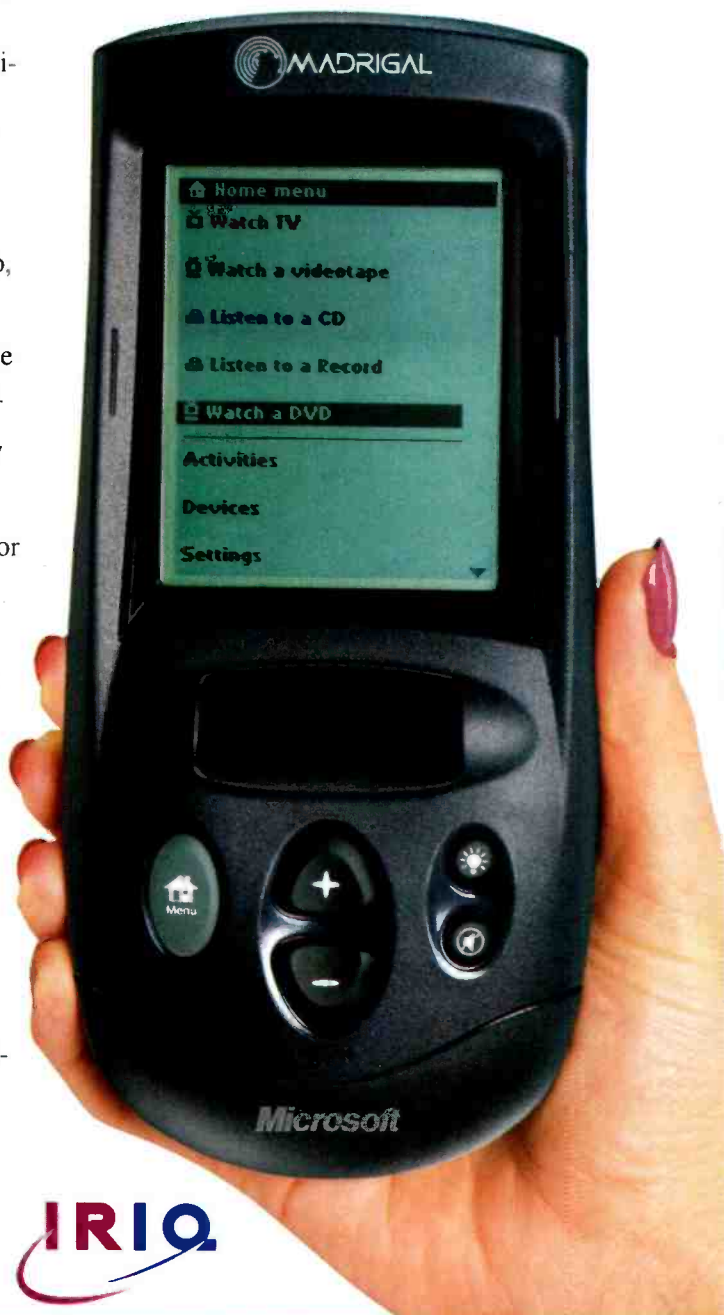
Control virtually any infrared device you own: audio, video, lighting, drapes, etc., with IRQ.

- ◆ The **programmable, backlit touchscreen** shows only the buttons you need, and you can name them what you like.
- ◆ **Macros** can be used to send a sequence of commands by touching one button.
- ◆ Choose from **thousands of preprogrammed IR codes**, or **teach IR commands** for new components through the learning port.
- ◆ The innovative new **selector wheel** makes IRQ the ultimate surfing tool: rolling the wheel changes channels, selects menu commands, scrolls through text, and more..

IRQ is the result of a joint development project between Madrigal, Harman International and Microsoft. IRQ is available exclusively through Madrigal dealers who are audio/video specialists. They can provide programming services to help you get the most from your purchase.

Madrigal is known for manufacturing some of the world's finest audio, home theater, and multi-room distribution products. Madrigal's brands are Mark Levinson®, Proceed®, Citation®, Audioaccess™ and Revel®.

For information contact Madrigal, Department AU, at (860) 346-0896, or fax (860) 346-1540.



MADRIGAL

Contact MADRIGAL
Dept. AU
P.O. Box 781, Middletown, CT 06457 U.S.A.
www.madrigal.com

■ A Harman International Company

IRIQ

Microsoft is a registered trademark of Microsoft Corporation in the United States and other countries and is used by Harman International under license by owner.

Spectrum

BY IVAN BERGER

PULLING THE PLUG ON ENERGY LEAKAGE



EPA

DOE

SAVING THE EARTH. SAVING YOUR MONEY.

Remote controls save energy—or, at least, save ours: no more leaping from the couch to change volume, program source, or TV channels. But the devices that use remotes also squander energy. When they're "off," they're actually in standby, with some circuits keeping an infrared eye open for a remote "on" command (and, possibly, keeping some tube filaments warmed up for quicker turn-on).

According to researchers at the Florida Solar Energy Center and the Lawrence Berkeley National Laboratory in California,

standby operation is just one of the ways that consumer electronic devices waste power when they're not in use.

Battery chargers, cordless-phone base stations, and wall-wart power supplies draw a bit of current all the time they're plugged in. The clocks of VCRs and microwave ovens draw a trickle of electricity, too. Figures from Lawrence Berkeley reveal that "the average U.S. house 'leaks' about 50

watts" from such sources. This may not sound like much, but it adds up to 1.2 kilowatt-hours (kWh) per 24-hour day, or 438 kWh per year—about two-thirds the power used by a modern refrigerator and nearly 5% of the average home's overall power consumption. (That's actually a slight exaggeration, as each of these devices is sometimes in use, consuming more power but wasting less.) Nationwide, according to *New Scientist*, that's "enough to power cities with the energy needs of Chicago or London." And generating all that power (for which consumers pay from \$1 billion to almost \$3 billion a year) causes as much air pollution as 6 million cars.

Audiophiles, a small percentage of the U.S. population, inflate the power leakage disproportionately. Many of us leave our stereo equipment on all the time, in the expectation of improved sound; owners of equipment that draws lots of power at idle, such as tube gear and Class-A amps, seem especially likely to do so.

What can be done? As consumers, we can reform our habits, pulling the plugs on devices that would otherwise waste power or turning off their master switches (which are usually, alas, on the rear panel—if they exist at all). We can also look for energy-efficient devices, such as those labeled Energy Star in the United States, Blue Angel in Ger-

More on K-Stat

The K-Stat output transistors in Kenwood's VR-2090 receiver, reviewed in last month's issue, do, as Kenwood says, "incorporate the temperature sensor in the transistor itself." I've just learned the reasons for this construction.

Most transistors' gain and distortion characteristics vary with temperature and bias. Thus, as a transistor's temperature changes, its bias should change to compensate. Conventionally, an amplifier's heat sensor and bias adjustment are on its heat sink; K-Stat power transistors have them built in. As a result, says Kenwood, each transistor's bias ad-



justs individually—and instantaneously, with virtually no lag between a temperature change and a compensating bias change. Kenwood also claims that, by optimizing bias at all times, this design technique improves reproduction of low-level signal details.

news & notes

● The world's smallest, lightest MiniDisc portable—so far—was announced in Japan last December by Panasonic. At 2.9 x 3.2 x 0.6 inches, it is similar in size to the cases blank MiniDiscs come in. A magnesium-alloy housing helps keep weight down to 2.4 ounces, and a single lithium battery is said to run it for 40 hours per charge.

● Lots of audiophiles build their own speaker systems (a friend of mine even built his own electrostatic drivers), and many others build amps. But cylinder phonographs? A surprising number of people are building their own (not that they have much choice about it). If you want a look, check out the Web site of Christer Hamp, in Stockholm (<http://home5.Swipnet.se/~w-56154/phonogr/>). From there you can click on links to the sites of other builders.

● Clarion's AutoPC, which was first announced at the January 1998 Consumer Electronics Show, is finally reaching the market. The \$1,299 base model is an AM/FM/CD head unit with voice recognition, an infrared port for communicating with palmtop and handheld PCs, and mapping software for navigation. Options include a GPS (global positioning satellite) navigation system, a USB (universal serial bus) jack, and a CompactFlash slot to connect to other devices (such as a wireless e-mail transceiver). A version with output for a color display is promised for late this year.

The AutoPC operating system, a version of Microsoft Windows CE, has been licensed to Alpine, Infinity, JBL, and Samsung, and there's a strong likelihood that Ford's Visteon division (formerly Ford Audio) will follow suit.

many, Nordic Swan in Scandinavia, or Energy 2000 in Switzerland. (Some of the European labeling programs also cover product recycling.)

Some computer monitors, TVs, and other devices now carry the Energy Star label here, and the U.S. Environmental Protection Agency will have announced standards for home audio gear by the time you read this. Until 2003, audio components (including rack systems) that draw 2 watts or less in standby will qualify for Energy Star labeling, though DVD players can get away with 3 watts in standby. Starting in 2003, audio and DVD products will have to draw 1 watt or less to qualify.

Often, the circuits that cause energy leakage are not the ones being powered but the supplies that power them. According to Rob Frizzell of Power Integrations, which makes power-control devices, "Turn-on circuitry typically draws just a few microamperes.

But a transformer-operated power supply, which is inefficient at low power draws, will consume a watt or two, maybe more, to provide those few microamps." The solution offered by Frizzell's company is a controller IC for switching power supplies, which is claimed to raise a supply's operating efficiency to about 70% ("90% if you optimize just for efficiency," says Frizzell) and whose power draw drops below 100 milliwatts when no power is required. For high-power applications, the standby functions could be handled by a separate supply using a Power Integrations chip; for very low-power applications, a single supply might suffice. These devices increase component manufacturers' costs by about a dollar or two per finished product and add about \$2 to \$10 to a product's retail price. However, the devices should eventually pay for themselves through reduced electrical consumption.

Roundabout Remedies

Sometimes, problems that afflict our stereo systems are easy to solve. (That's especially true if they affect just one channel.) But two problems I ran into recently were real head-scratchers.

The first was in my home theater, where replacing my powered sub raised the hum level from subliminal to loud. The sub didn't hum until my Dolby Digital receiver was hooked up to it and turned on—a ground loop, obviously. I tried the time-honored tactic of reversing the sub's AC plug and then the receiver's (not easy when both have three-wire plugs), to no avail. That left me with the other time-

honored fix, replacing the sub's connecting cable with one whose shield contacts only the plug at one end. Before I could do that, however, the sub's manufacturer told me that my hum problem involved neither the sub's signal cable nor its AC cord but, rather, my cable-TV feed. To prove it, the company sent me a simple gadget that connects between my TV and the cable, passing broadcast and cable signals but interrupting the ground path.

That broke the ground loop, and the hum disappeared. There are several such gadgets on the market, including Mondial's MAGIC and Tributaries' GroundGuard, which cost about \$100 each.

The second problem was in the sound system of my Merkur Scorpio, which suddenly went dead as I drove over a bump. Usually, that sudden a silence means the power has died, so I checked the DC going to the amp and equalizer (the head unit still lit up, so I knew power was reach-

ing it); both were getting just under 14 volts. Next, I injected a signal into the amp from a portable radio's headphone jack;

silence still ensued. In

desperation, I checked the amp's four fuses (one per channel); all were good. No matter how I rummaged through the amp rack in my trunk, I could find nothing wrong.

And no wonder—the problem was up in the dash. A fuse had popped in the line that fed the turn-on trigger signal to my amp and EQ when the head unit was on. Replacing the fuse brought back the sound. But I still don't know why that bump made it blow.



Tributaries' GroundGuard can solve a home theater's hum problems.

Test Topics: FM Tuner Quieting

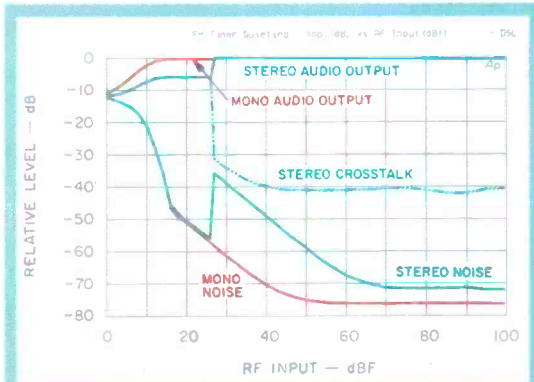
This is the second in our occasional series of "Test Topics," explaining standard graphs and measurements. Feel free to suggest other subjects for the future.

A graph of FM tuner quieting looks complex, because it tells us about many aspects of a tuner's performance. Once you know how tuners perform, however, it's easy to understand.

When there's no radio-frequency (RF) input signal at all, FM tuners produce only noise. But as the signal's strength increases, the tuner's audio signal output rises quickly to its maximum and the noise level drops and drops until, at some strong signal level, it's dropped as far as it can go.

The noise level in stereo is almost always higher than it is in mono, so tuners are often designed to switch to stereo only when the input signal reaches decent strength. In

the tuner tested for the graph presented here, the transition occurs at about 27 dBf, indicated by the sudden jump in stereo noise (previously just about identical to mono noise) and the sudden appearance of a stereo crosstalk curve. (In mono, obviously, the two channels blend completely, so there's no separation between them.) If you extrapolate the slope of the stereo noise curve's missing section, you can see why the designer chose to do this: In stereo, noise would probably be about -27 dB at 15 dBf,



Quieting characteristics of an FM stereo tuner.

only about 20 dB below the audio output at that point.

The reason the two noise figures don't match is that before the stereo circuits switch on, this tuner's audio output in stereo mode is as much as 6 dB lower than its audio output in mono. This difference occurs because only one channel of the RF signal in the test is modulated (the unmodulated channel's output is seen as the "Crosstalk" curve).

Many tuner measurements are made with a signal input of 65 dBf. The graph hints at the reasons: 65 dBf is enough signal to drive most tuners to their maximum quieting point in mono (and often, though not here, even in stereo), and it's far below the input level at which a tuner might overload. (Overload creates such problems as cross-modulation, which makes strong signals pop up at several points on the dial.)

As with most decibel measurements, "0" on the dBf scale does not mean no signal but, rather, the reference point for that scale: in this case, 1 femtowatt, or 1-quadrillionth of a watt (10^{-15} watt). The presence of that almost infinitesimal signal is enough to cause a slight divergence between the noise and the audio output level at the far left edge of the graph.

news & notes

Some JVC and Sony cassettes now come in one-piece slide cases instead of hinged boxes. The JVC version, which I haven't seen, is said to be 17% slimmer than a conventional case (allowing 10 cassettes to fit a space that holds eight normally packaged tapes) and 23% lighter. Sony's has a thumb slot so you can slide the tape out with one hand—a boon to drivers juggling tapes in traffic.

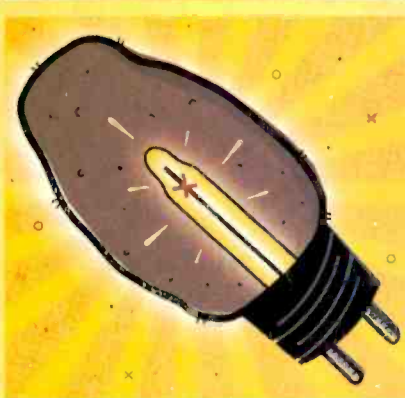


Research indicates that regularly hearing harmonious music can enhance a baby's learning ability. But in many homes, they never hear any. So last year, then-governor Zell Miller of Georgia came up with the idea of including a collection of soothing classical music with the sample baby-care products hospitals send home with newborns. The collection, *Build Your Baby's Brain*, includes 11 selections by Bach, Beethoven, Handel, Mozart, Pachelbel, Schubert, and Viva di. Sony Disc Manufacturing, in Carrollton, Georgia, donated 50,000 CDs and 50,000 cassettes to hospitals in that state. A commercial version, with 17 selections, is now on sale (Sony SFK 60815).



The Society of Professional Audio Recording Studios (SPARS) celebrated its 20th anniversary late last year by announcing plans to produce a series of video programs on the development of the recording studio industry. The programs are to be released on DVD next year.

Potato Power



What fills the gap between tube circuitry and solid-state? Apparently, a vegetative state—otherwise, why would one high-end manufacturer list its amplifier's complement of "output tubers"?

Illustration: Jack Gallagher

RECAPTURE THE EMOTION.

RELIVE THE EXPERIENCE.

QUINTET™

the world's only horn-loaded microsystem.

delivering marquee theater sound

and concert hall acoustics.

THE POWER of KLIPSCH.



It's Alive.

And exhilarating. Experience the wonder of big cinema sound and the electricity of a command performance with the Klipsch Quintet Micro Theater. Quintet integrates the science of Klipsch Professional speakers—featured in movie theaters and concert halls worldwide—to transform your home into a spectacle of theater-sized proportion. Designed to optimize Dolby Digital, DTS and all 5.1 surround formats, Quintet is the world's only horn-loaded microsystem that flawlessly embodies cinema & music. Visit your local Klipsch audio specialist to experience microsystem performance like you've never heard before. Quintet. It's Alive.

Learn more about the heart and science of the Klipsch sound by calling 1-800-KLIPSCH, or for the surfing savvy, visit us online at www.klipsch.com.

 **Klipsch**®
A LEGEND IN SOUND.

©1998 Klipsch Inc. All rights reserved.

Klipsch at the Orpheum. The 200-plus-seat Orpheum Theatre in Memphis, TN, was recently chosen by Turner Broadcasting to show the digitized, remastered movie, "Gone with the Wind." Recreating the film's every nuance required a significant sound system upgrade. The premier of choice? Klipsch.

TROUBLE WITH TAPING

It was the sort of headline guaranteed to enrage all of those who believe that the United Kingdom should pull out of Europe before it's too late. And yet I heard about this latest horror courtesy of a decidedly non-sensationalist breakfast TV news program, well before I got anywhere near a newsstand. But when I did get to one, right on the front page of London's *Daily Telegraph* were the words, "Videoing the TV could be banned."

Oh, to be a fly on the wall at Sony, Philips, JVC, or Panasonic when that story reached their head offices!

Mere scare-mongering by Euro-phobes? I don't think so, although, if I had my way, the British would fill the Channel Tunnel with concrete and mount long-range cannon on the White Cliffs of Dover to keep out the French. My anti-Europe political leanings aside, even the most pro-"Euro-Superstate" fanatic would have to agree that it's getting to the point where the word "Kafkaesque" no longer covers the insanity of the non-elected scum who make the rules for 270 million Europeans.

C'mon, no more taping your favorite programs for later viewing? Is nothing sacred?

But it is a genuine threat, in case you've forgotten all the ranting and raving in the early '80s about how blank tapes (audio *and* video) should be subject to massive levies, designed to discourage tape piracy. And that's what it's all about: The vermin in Brussels, egged on by the home entertainment software companies, are convinced that every citizen of Fortress Europe is ripping off both the music and film industries by taping instead of buying. What they fail to acknowledge are three key issues: (1) The downturn in music and video sales has more to do with the unbelievable success of

WHY TARGET THOSE WHO DON'T USE THEIR VCRs FOR PROFIT OR GAIN?

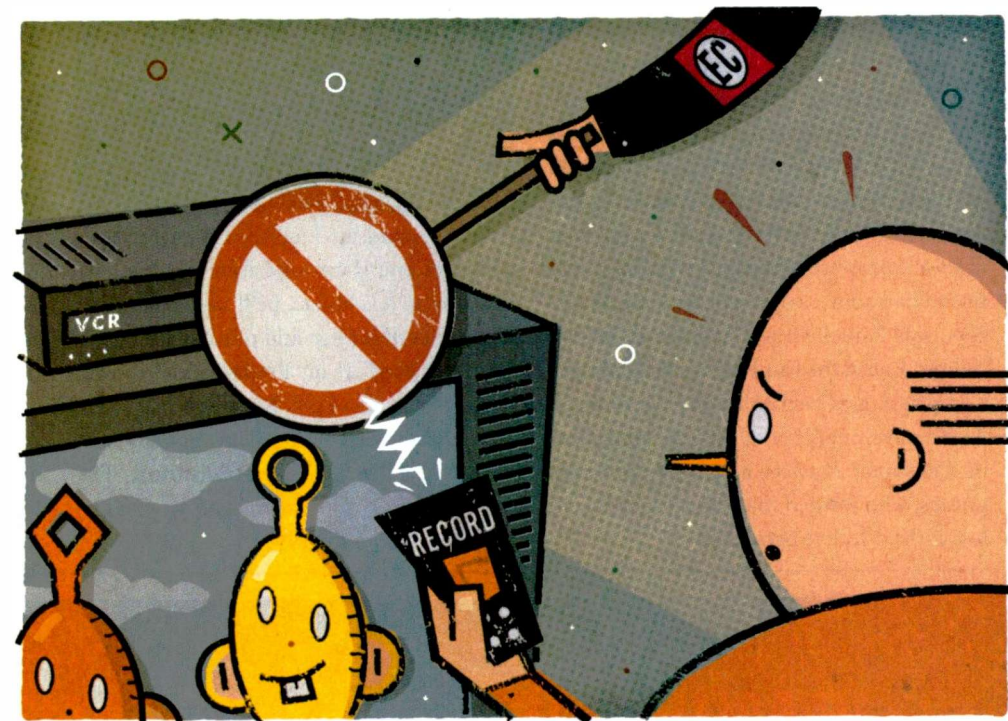


Illustration: ©Jack Gallagher

computer games in siphoning off vast amounts of disposable income; (2) the risible standards of the current pop market don't exactly encourage CD sales; and (3) most tape piracy occurs in Pacific Rim territories, not in the United States or Europe.

It's the last point that has aggravated so many. Go to almost any major Asian city, and you'll find street vendors flogging umpteenth-generation copies of the latest films and albums, unhindered by the police. (Fact: The Hong Kong government made noises to the likes of Rolex and Cartier about how much effort it was exerting to stamp out counterfeit goods. Alas, the govern-

ment also said it was having a hard time locating the factories. Curious, that, because the very first time I ever visited Hong Kong, nearly a decade ago, American—not local—friends took me to one of these very factories within two hours of my landing. And it happened to be on Nathan Road, Hong Kong's answer to Fifth Avenue and Rodeo Drive!) I recall once going to Kyoto's largest record store, surprised to find rack after rack of bootlegs; on close examination, the bootlegs proved all to be of material by non-Japanese artists. But try buying a pirate CD (let alone a bootleg) in the United Kingdom or the United States; the clampdown has been so successful that tape piracy in Europe exists mainly in the minds of paranoid lawyers and accountants working for the media giants, desperate to find a third party to blame. To put it more precisely,

they need a scapegoat to deflect attention from their own inadequacies.

But back to the revelations of Andrew Sparrow, the *Telegraph's* political correspondent who returned the issue of videotaping to the front line. He reported that Europeans could be stopped altogether from taping TV shows at home or (more likely) be forced to pay a new tax, courtesy of the copyright laws currently being rewritten in Brussels—the heart of the European Superstate.

As expected of the current right-on, touchy-feely British government, ever quick to give lip service (but little else) to consumer welfare, its immediate response was that it was “not happy” with plans to curtail the right of individuals to record programs for personal use. Furthermore, a campaign against a proposed European Union directive to harmonize copyright laws across Europe was launched at Westminster in December. Called the Fair Practice in Copyright Campaign, it is backed by the Consumers' Association, publisher of the U.K. equivalent of *Consumer Reports*, and other pressure groups, who warned that “all viewers would lose if the directive became law.”

Normally, the word “harmony” appears in *Audio* in reference to a musical performance. In Europe, “harmonization” means that all citizens should suffer equally. Which reminds me of a lesson I was taught the very first day I spent in the U.K., a classic illustration of the difference between an

**CAN YOU IMAGINE
A BRITISH LAGER LOU
BEING TOLD
THAT HE CAN'T RECORD
THE FOOTBALL MATCH?**

American and an Englishman of the pre-Thatcher era: If an American sees his boss drive by in a Cadillac, he'll say, “I'm going to work even harder, and one day I'll have a Cadillac, too.” If an Englishman sees his boss drive by in a Rolls-Royce, he'll say, “We should call a strike and bankrupt the bastard so he'll lose his Roller.” Substitute “European” for “Englishman,” and you've updated the axiom for 1999.

Fortunately for the Euro-skeptics, the announcement about abolishing the right to tape TV shows was made during the same month it became clear to all that the long-term plan for Europe is to harmonize taxes. This means that the British, for example, will have to pay the same destructive sales, income, and corporate taxes as, say, the Germans. Naturally, this harmonization doesn't mean that the British will also reap the benefits of German wages or Belgian car prices, but that's neither here nor there. Nor does this so-called harmonization mean that the British will be able to buy bootlegs or hard-core porn, both of which are sold quite openly in Holland, Italy, France, et al. Hell, the British can't even legally buy Region 1 DVDs.

The Directive on Copyright and Related Rights in the Information Society was conceived to harmonize European copyright law, and it would therefore restrict the right of individuals to record programs for personal use, i.e., good ol' time-shifting. In its most extreme, totalitarian form, the directive could ensure that viewers are prevented from recording programs at home for their

IF MUSIC IS SO IMPORTANT TO YOU, THEN WHAT ARE THOSE PATHETIC THINGS ATTACHED TO YOUR COMPUTER?

Chances are, you spend more time in front of your computer than your stereo system. You shouldn't have to settle for computer speakers that can't reproduce good, honest sound.

Introducing the Media Lab[®] ML-1. It's designed by Parasound, well-known for critically acclaimed high end audio and home theater components. Media Lab sells directly to consumers, which is one of the many reasons you won't find another desktop speaker with better sound for the money. But what you will find are the same designs used in the finest audio components, including discrete output transistors in both the main and subwoofer power amplifiers for sweeter treble and deeper bass. With its unique active servo circuit and direct-radiating construction, our subwoofer gives you far more bass and less distortion than the “one-note” bandpass designs used by other manufacturers.

The Media Lab ML-1 comes with a 30-day, money-back guarantee. To order, or for more information, call our toll-free number or visit our website at www.medialab-hifi.com.

ORDER TODAY

\$199

plus shipping and handling

www.medialab-hifi.com

1-877-63-MEDIA

toll free



Media Lab

Media Lab[®] is registered trademark of Parasound Products, Inc.

own use. How could this ever be put into practice?

Like the U.S., Europe is moving rapidly toward all-digital broadcasting. And when that technology becomes the norm and analog broadcasting disappears, encoding a spoiler signal or some other trigger to prevent recording will be a piece of cake. I, on the other hand, am convinced that no state steered by the French and Germans can be anything other than totalitarian, so I foresee the day when all recording equipment, short of answering machines, is either banned altogether or hamstrung for uses other than saving one's own computer files or digital photos.

An unnamed Whitehall source "admitted that the campaigners' fears were justified. It is fair to say that the directive could bar viewers from recording their favourite television programmes. We are not happy about this." Another voice, Consumers' Association lawyer Eileen Brennan, said, "The threat is real. At the moment, people can record *Coronation Street* if they miss it, but maybe in the future they will not be able to do it." That would—or should—incite mass rioting, because *Coronation Street* is the U.K.'s longest-running soap opera. And can you imagine a typical British lager lout, violently drunk on 14 pints of beer, being told that he can't record the football match he'd miss while out crawling from pub to pub? There'd be blood on the streets of Brussels.

Under Britain's current, relatively sane and sensible copyright law, we are exempt from the rules protecting copyright when we videotape a program for personal use. But most European countries' copyright laws are different and vary from country to country; many already apply a levy on blank tapes "in general terms to compensate copyright holders for the use of their material." It would appear that that's not enough.

None of us can argue against the idea that the film and music industries deserve freedom from the losses attributable to piracy. But why target those who don't use their VCRs or tape decks for profit or gain? Quite clearly, those who make the rules in Brussels need a reality check. These bureaucrats are the same people who created "standard" banana and cucumber sizes and shapes to which all produce sold in Europe must adhere. They're the same twits who pay massive amounts of money to farmers

for *not* growing crops, at the same time letting surpluses pile up and rot rather than ship them to countries suffering famine. They're the idiots who have yet to acknowledge that modern cars pollute less than cows' backsides and who won't allow the British to call their chocolate "chocolate."

One day, long after my grandchildren have shuffled off this mortal coil, a revolution will occur, after which all will be revealed, e.g., which corporations back in the 20th century slipped money into which politicians' pockets or, more likely, which

pathetic little Belgian bureaucrat had a fight with his wife one morning and decided to take it out on the world. But what I'd really like to know is how much the CE regulations have cost the global hi-fi industry—through banning 4-millimeter connectors, placing unrealistic limits on RF output, ad nauseam. And then I'd like to find the jerk who thought 'em up and lock him in a room with 500 speaker and amp designers, all fired up on absinthe.

Which has probably been made legal again in France. A



THE ANT CAN LIFT TEN TIMES ITS WEIGHT.

So don't be surprised when you hear the PSB Alphas in a home theater or music system - big performance, small package.

"What has always impressed me most about Paul Barton's designs (and I reviewed many of his creations over the years) is their musicality. The little PSB Alpha bookshelf speaker...remains a benchmark for sonic performance in the \$200/pair range."

Lawrence B. Johnson
Stereophile Guide to Home Theater, Vol.3 No.3



psb
SPEAKERS

888 772 0000
www.psbSpeakers.com

Who pushed in the TWEETER ?



No, it's not every audiophile's nightmare; it was designed that way. The revolutionary JMLab/Focal inverted dome tweeter lies at the heart of Focal's international success. It has proven far superior with better coupling and wider dispersion . . . giving you better sound. Manufacturing efficiency has allowed JMLab to offer this technology in their surprisingly affordable Tantal series. The unmatched transient response of these speakers will bring you closer to the live musical event - the trademark of all JMLab products.



Tantal 507
550 \$



Tantal 509
700 \$



Tantal 515
900 \$



Tantal 520
1100 \$

ALL THUMBS

Every family has its own special year-end traditions. This past Thanksgiving found the Greenbergs engaged in our usual home-for-the-holidays ritual, the one where I upgrade something in my parents' home theater—at their request, I hasten to note—and they spend the rest of the time complaining that they can't make their system work anymore. This year, what started things was the new A/V receiver I bought them, a really nice Harman Kardon to replace their old Pioneer. Of course, that meant a new remote for the receiver (and we all know how well the elderly embrace new things). Like all bundled remotes, it wasn't the "learning" type, so it couldn't be taught to control the CD player, the VCR, the DSS, or the swivel-base TV they'd yelled at me for in Thanksgivings past.

Like all family acts, we've honed ours into a real honey of a routine over the years:

Me: There, now, doesn't that sound better?

Father: *Feh!* Who cares if it sounds better?! I can't work this cockamamie remote!

Mother: Hasn't your father suffered enough?!!

Me: Here, let me see the remote—no, the other one—no, Dad, the *other* one.

Father: Is it so much to ask a son to just hook up the TV the way it was before?!



Mother: First you choose a profession that's beneath dignity, now you want we should miss *Matlock*?!! What kind of monster did I bring into this world?!!

A few days later, I was on the flight home, asking the stewardess for five or six of those little bottles of airplane whiskey. In the midst of this, I got a great idea: I'd wangle review samples of two new mega-remotes, Marantz's RC2000 Mk. II and Harman/Microsoft's Take Control, put them through their paces in my own system, and then buy whichever one I liked better to give to my parents for Hannukah. The sweet, sweet liquor making everything all right again, I fumbled with the GTE Air-Phone and ordered up those mega-remotes.

The Marantz RC2000 Mk. II, of course, replaces the original RC2000, which quickly established itself as the high-end remote of choice. I've been using and praising this remote for years, and it's kept me sane through hundreds of gear changes. I've tried all the fancy-shmancy learning remotes, the kilobuck LCD touchscreen jobs, you name it. But the Marantz is by far my favorite at any price, for the simple reason that it really does control everything in your home theater (well, almost everything—it won't control my Pioneer big-screen). It does this no matter how much hardware you've got hooked up and is a pleasure for the human hand to twiddle. The buttons fall right where they should, the shape and balance are right-on—even for such a large remote—and

Illustration: ©Philippe Lechien

MARANTZ

440 Medinah Rd.
Roselle, Ill. 60172
630/307-3100

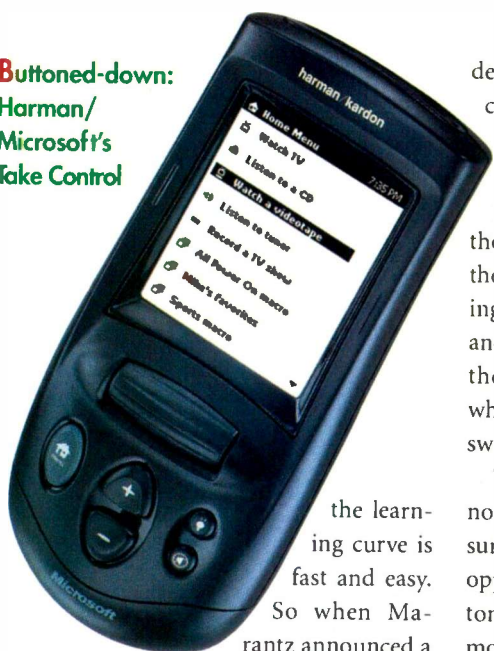
www.marantzamerica.com

HARMAN/MICROSOFT

c/o HARMAN KARDON
250 Crossways Park Dr.
Woodbury, N.Y. 11797
800/645-7484

www.harmankardon.com

**Buttoned-down:
Harman/
Microsoft's
Take Control**



the learning curve is fast and easy. So when Marantz announced a

new and improved version of the RC2000 for \$250, the same price as before, I was eager to see what the company could possibly do to make such a great remote even better.

The \$349 Harman/Microsoft Take Control remote, on the other hand, is an all-new design that answers the question, "If a couple of 300-pound gorillas had wild, sloppy sex, what would the baby look like, and, even more important, could it control my Pioneer big-screen?"

Looking like a cross between an overgrown Microsoft Mouse and a Palm Pilot, the Take Control does away with the many-buttoned approach of the Marantz and gives you a backlit screen to tap and a thumbwheel to diddle. It's a big, bulbous-looking thing, smartly retro and futuristic at the same time, in the manner of Apple's iMac and VW's New Beetle.

The new Marantz remote feels lighter than the Harman/Microsoft, and, at least in my hand, it felt more comfortable to hold and operate. I could be biased, living as I have with the original Marantz remote for several years now, but the Take Control did seem a bit more ungainly in my grasp than the new Marantz, which feels just like the old remote because it shares the same physical package.

Where the RC2000 Mk. II takes off is in the number of extra buttons Marantz stuffed onto it in answer to all the cries for

dedicated channel up/down controls, DSS controls, and especially the ubiquitous menu, on-screen, and clear buttons everyone's got to diddle with when playing DVDs. Marantz has also swapped the positions for the numerical keypad and the CD/VCR/etc. transport controls, moving the numbered buttons to the bottom and the play/rewind/pause/etc. buttons to the middle, right where your thumb—which is definitely up, in recognition of this swap—wants them to be.

The new channel up/down buttons are not as optimally placed, though I'm not sure where else I'd put them. They're on the opposite side of the volume up/down buttons, making it a real thumbstretch. Like most RC2000 users, I'm sure, I've long since assigned channel up/down to the li'l cursor nubbies at the bottom of the remote, making the move from volume twiddling to channel flicking as easy and natural a thumb motion as da Vinci could ever have conceived. Ingrained as I am, I'll probably program the new Marantz's cursor nubbies the same way, but RC2000 fans who've been bleating for channel buttons will likely welcome the new configuration.

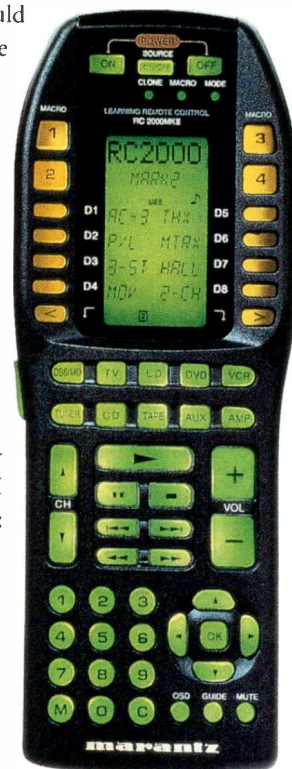
One new feature of the RC2000 Mk. II that does deserve a round of toasts is its nonvolatile memory. The old Marantz has the maddening habit of losing all of its settings when you change its four AA

batteries, which you do every few months or so. Not the new Marantz. You set up this baby one time, teach it how to control everything in your rig, and then watch it roll over and shake hands too. But when it decides to play dead and you have to replace the batteries, it remembers everything you taught it. Even if the batteries go stone-cold dead. Man, I must have retaught my original RC2000 how to control my system a hundred times. The new Marantz's nonvolatile memory is a godsend and reason enough for RC2000 owners to trade up. Plus, Marantz has given the new version even more memory than the original, to answer critics who found that the RC2000 ran out of memory when they tried to store a very intricate system's command codes.

But if you want to talk ease of setup, the Marantz can't come within spittin' distance of the Harman/Microsoft Take Control. Because in many cases, you won't even have to point individual remotes at it and get them to "pitch" as this mega "catches" each and every last command. You have to do that with the Marantz, but the Take Control has its own automated, interactive setup routine. Its friendly onscreen menus ask you what kind of source component you wish to add to the remote, letting you scroll through a list of manufacturers (although here it gets a bit wacky: You telling me someone laying down 350 clams for a remote is more likely to own a Yorx A/V receiver than a Theta Casablanca surround preamp?) and then letting you try out different codes until you find the ones that correspond to your gear. It's so simple and easy and friendly and, well, Microsoft. Even if you despise the company, you're going to love how easy it is to get this remote up and running with your system. Take Control also comes with its own setup CD-ROM and PC interface cable if you want to really get in there and customize the bejesus out of it.

The Take Control is deceptively simple; while it looks much easier to operate than the Marantz, it's in hands-on use that you discover its complexity. I won't even get into the intensive macro routines you can program this thing to run, but suffice it to say that you could probably jolt the Pentagon's war room into Def-Con 5 with a mere thumb twiddle. Alas, what I mainly found with the Take Control was the same thing I have found with every LCD touch-screen remote I have ever used:

**Its aim is true:
Marantz's
RC-2000 Mk. II**



**THE NEW MARANTZ'S
NONVOLATILE MEMORY
IS A GODSEND AND
IS REASON ENOUGH
TO BUY THE MK. II.**

GO NAKED

shopping.yahoo.com

TO THE MALL

Too busy to hit your favorite stores? Shop on-line with Yahoo!® Shopping.
With more choices of everything from flowers to jeans, stereos to jewelry.

It's fast. It's safe. It's a shopper's paradise.



Worldwide. Webwide. Visa® It's everywhere you want to be.®

MUSIC AND HOME THEATER SYSTEM ONE

Part of the all-new
Performance Series!

THINKING ABOUT HOME THEATER?
MUSIC? IF YOU'RE PLANNING TO BUY
SEPARATE SPEAKER SYSTEMS FOR EACH,
HERE'S A WORD OF ADVICE: DON'T!

GOOD SOUND IS GOOD SOUND:
WHETHER YOU WANT TO ROCK OUT,
WALTZ THE NIGHT AWAY OR SWING LIKE
CRAZY, DADDY-O, THESE NEW PARADIGM
SPEAKERS WILL DO IT ALL — AND THEY'LL
SHAKE YOUR HOME THEATER, TOO!



\$816

PARADIGM SYSTEM ONE	
FRONTS:	MICRO
CENTER:	CC-70
SURROUNDS:	ADP-70
POWERED SUB:	PDR-8

PARADIGM SPEAKERS ARE SONICALLY
ACCURATE, WHICH MEANS NO MATTER
WHAT YOU WANT TO HEAR, THEY'LL
SOUND BETTER THAN ANYTHING
ELSE OUT THERE.

GET IN TOUCH WITH YOUR LOCAL
AUTHORIZED PARADIGM DEALER
TODAY AND ASK TO HEAR THE
PARADIGM SYSTEM ONE.

FOR A MERE \$816, IT'S
NOTHING SHORT OF AMAZING!

Paradigm

THE ULTIMATE IN HIGH-PERFORMANCE SOUND

that I didn't get on with it as well I would've liked to.

Maybe it's me, because I know plenty of high-end home theater nuts who swear by these things as the ultimate in one-touch, no-brainer system control. Another reviewer I talked to who's auditioning the Take Control loves it to death and hasn't had any of the problems I've had. Maybe it's my unique hand sweat, I don't know. What I do know is that I've never found an LCD touchscreen that responded to my finger taps as reliably as a real button. I tap on the virtual button on an LCD touchscreen, and the panel shimmers a bit—but nothing happens. So I touch it again, applying a bit more pressure. Nothing. I'm stabbing at the thing like a bullfighter before it gives it up to me and starts recording *King of the Hill*,

IF YOU PREFER USING
LCD TOUCHSCREENS,
YOU MAY FIND
THE TAKE CONTROL
TO YOUR LIKING.

and meanwhile I've lost the opening credits. To the Take Control's credit, its tactile response is better in this respect than other LCD touchscreen remotes I've tried. But even at its most sensitive setting, I couldn't get it to respond to my finger taps more than half the time. Like I said, maybe it's me, so if you've had good luck with LCD touchscreens, you may find the Take Control more to your liking than I did.

Which is a shame, because if that remote had worked as reliably for me as the Marantz, I'd probably give it the nod. It's far and away the better device for the average civilian—like, say, the rest of your family. As easy as the RC2000 Mk. II is to use once you get accustomed to its layout and features, it's got more buttons than Louie Anderson's truss, and in looks alone it's a little daunting to the uninitiated.

But in the end, I chose the new Marantz for my folks. In the time I had the two remotes side-by-side to play with, it was the RC2000 Mk. II I kept coming back to for everyday use. Except for a bit less signal-throwing strength than the original (the new version seemed a little more finicky

about how directly I aimed it at my gear, but this was more an issue of angle than distance), the Mk. II is better than its predecessor in every way. I want a mega-remote that's going to give me maxi control with mini hassle—something I can use day in and day out, in the dark or with eyes closed, airplane whiskey or no airplane whiskey—and one that I know is going to make my system hop-to on the first button stab. I also know that if even one time the Take Control didn't respond to my dad's finger tap, I'd hear him yelling before my coat came off and my bags hit the guest room floor next Thanksgiving. So the Marantz it was.

On the last night of Hannukah, I called my parents. Here's how it went:

Me: Dad, before you start yelling, let me walk you through the remote.

Father: What are you talking about? I'm already using it; it's hot stuff!

Me: Really? You didn't have any trouble with it?

Father: Trouble, what trouble? You want to talk about trouble, that Father Dowling, he's had trouble ever since he left that show with those three goils, what were their names?

Mother: That was the other one. You're thinking of Mr. Happy Days.

Father: I am?! Either way, those goils were some hot lookers!

Me: So, Ma, you're happy with the Marantz remote? Both of you can use it all right?

Mother: Yes, dear, everything is much easier now. So when are you coming home for a visit? I've got all your old *High Fidelity* magazines stacked right by your nightstand, just like you left them when you went off to. . . [She starts sobbing into phone for first time, ever.]

If you like LCD touchscreens and don't have the trouble I do with them, you'll probably find the \$349 Harman/Microsoft Take Control remote to be the best you've ever seen. It's packed with features and can do it all. But in the end, my hand preferred the \$250 Marantz RC2000 Mk. II. If you loved the original, you'll do backflips over the new version. It really is a better remote, and it's what I'm going to use in my own system from now on. And, yes, it does control my Pioneer big-screen! A

DON'T LET THE PRICE FOOL YOU

**"I'VE HEARD HIGHLY REGARDED
\$2,000 2-WAY 6-INCHERS THAT
COULD NOT KEEP UP WITH THE
[\$339] PARADIGM MINI MONITOR"**

- Corey Greenberg, Audio

NOW, SPECTACULAR HIGH-PERFORMANCE
SPEAKERS CAN BE YOURS FOR AS LITTLE AS
\$149 PER PAIR. COMPLETE HOME THEATER
SPEAKER SYSTEMS - POWERED SUBWOOFER
INCLUDED - BEGIN AT A SHOCKING \$816.
BUT DON'T LET THE PRICE FOOL YOU.
SPENDING MORE ON OTHER BRANDS
WILL ACTUALLY GET YOU LESS.

LISTEN TO THE MOST AWARD-WINNING
SPEAKERS OF THE '90S AT YOUR LOCAL
AUTHORIZED PARADIGM DEALER TODAY.

www.paradigm.ca



In the US, contact AUDIOSTREAM, MPO Box 2440, Niagara Falls, NY 14302 tel 905.632.0180

In Canada, contact PARADIGM, 205 Annagem Blvd., Mississauga, ON L5T 2V1 tel 905.564.1994

Copyright © 1998 Paradigm Electronics Inc. and Boyan Corp.

Prices reflect manufacturer's MSRP.

Paradigm

Paradigm®

THE ULTIMATE IN HIGH-PERFORMANCE SOUND™

A • U

SITE-SEEING ON THE WEB



If you're looking for equipment information or just want to talk to other audiophiles, online opportunities abound.

Photograph: © SuperStock

www.audiocafe.com www.goodmusic.com www.aes.org www...

www.audiorevolution.com www.dvdmusic.com www.sstage.com

by Gordon Brockhouse

DIY

When someone got the itch to buy a new audio component, the first stop in years gone by usually was the newsstand. The goal was to stock up on magazines and read as many equipment reviews as possible. But now the first stop is likely to be the computer, the goal being to access the wealth of audio and video information available online.

Online sources of information can't replace specialty magazines. Few sites have the testing resources that the best print publications have, although they can certainly complement print. From online discussion boards, you can find out about other audiophiles' experiences with equipment you're thinking of buying. You can also visit manufacturers' Web sites to get more detailed product information than is provided in print ads and to get a different perspective from reviews that are published only online.

There are more audio-related Web sites than can possibly be described in a single article. Fortunately, almost all sites have links to other ones. And once you get started, it's easy to keep exploring. So load a Beach Boys disc into your CD-ROM drive, start your browser, and let's go surfing.

(The addresses of the Web sites mentioned here are listed in a box at the end of this article. Enter them in the address line of your Web-browsing software. If you want to visit a site repeatedly, you can create a "bookmark" so that you don't have to keep entering the address.)

We'll start close to home. *Audio's* sister magazine, *Stereo Review's Sound & Vision*, has just launched a new Web site. *Sound & Vision* is a brand-new publication, resulting from the merger of *Stereo Review* and *Video* magazines. Its Web site features product reports, music and video reviews, shopping tips, and a "hot topics" area covering such subjects as digital television and DivX. In the future, columns from the magazine and technical background articles will be added. The site also features direct reports from major industry conventions—the Consumer Electronics Show, for example. Some things, such as an HDTV programming

guide and a buyers' guide to digital television, will be available on the Web site but not in the magazine.

That's the real attraction of the Internet: the ability to find information that's simply unavailable on the newsstand. Some audio-related sites are essentially online magazines, whose content is similar to what you'd find in a printed magazine. Others have information that can be culled only online, such as extensive appraisals of components by people who own them. You'll find commercial sites that hope to

turn a profit as well as others that are simply set up and run by individuals with a passion for audio.

Audio Café is an online equipment directory that's supplemented by additional features. Its database of audio products is organized into four areas: home stereo, home theater, portable audio, and computer audio. Each has a short basic introduction. Within each area, you can specify a product category

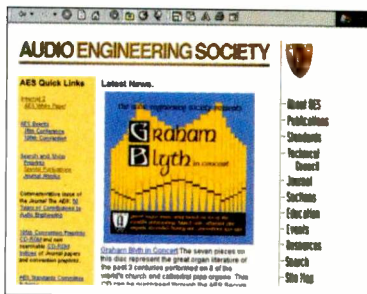


(DVD players, speakers, etc.) and price range; the site then lists products that meet your criteria. Each product listing contains a photo, the price, and rudimentary specs. (Speaker specifications, for example, include dimensions and weight but nothing about driver complement or crossover design.) And visitors can submit their own product reviews. The product database is very extensive though neither quite complete nor always current; a few prices are inaccurate. There's contact information for manufacturers of all products in the database, including e-mail and Web addresses. If you're searching for a particular type of product, Audio Café is a good place to start.

This site also has a news section (though there's not much news on it) and a section called "Her Fi" that addresses audio from a woman's perspective.

At the Audio Review page, you'll find reviews on thousands of different products, usually written by owners; occasionally, someone contributes a review based on a demo in a store or a friend's system. Visitors, of course, are encouraged to submit their own reviews, which are organized by type of component and then by brand. Most are written by audio enthusiasts, not journalists or engineers, and many are quite penetrating. If you realize that most people are predisposed to favor their own equipment and ignore the reviews that

throne (see the review of SoundStage!). This is an attractive, polished site where you'll find subjective reviews (no measurements) on a variety of products, from Sunfire subwoofers to a preamp/power amp combo by the British manufacturer Magnum to an EAD preamp/processor to Pioneer's plasma video display. There are also reviews of new movies, DVDs, and music CDs (except classical). Articles are well written and well edited, and they are plainly based on careful listening/viewing. Refreshingly, Audio Revolution's



reviewers pay attention to things like fit, finish, and usability. Occasionally, reviews betray a lack of technical knowledge. For example, the reviewer of a Pioneer DVD/laserdisc player

seemed unaware that laserdisc is a composite video medium and that a composite connection might be preferable to an S-video connection for laserdisc if the TV's comb filter is superior to the one inside the player.

E-town contains news items and columns on topics ranging from high-end audio to digital television (DTV) and computers, as well as a DVD release list. Articles are written by freelance authors and in-house staff, complemented by stories pub-

lished in *Twice*, a consumer electronics trade publication. Some stories have a mannered, consumer-watchdog tone, while others fall into the gee-whiz category. Most are nicely written and timely, and some are genuinely insightful. If you want instant coverage of a major event, such as the Consumer Electronics Show, E-town is a good place to look. On the other hand, its mes-

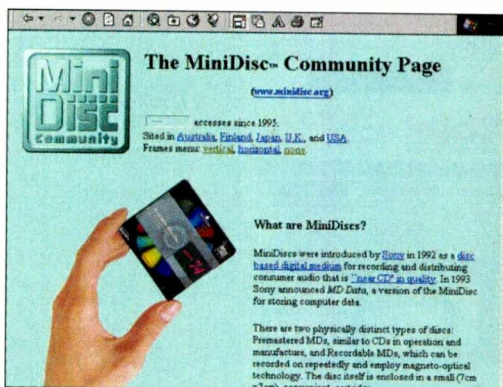


sage boards, which cover such subjects as DVD, DTV, high-end audio, and "beer-budget" audio, have the worst "S/N ratio" I've encountered online. Einsteins with handles like Cud Bucket and Porn Monkey trade insults and, occasionally, information. In the high-end audio message board, one poor soul who asked for advice on how to use different preamps with the same power amp (he wanted to use one preamp for home theater and another for music) was roundly trashed, even being told "it's a good thing breathing is automatic." Another regular, though, rushed to the inquirer's defense and, using foul language, took his tormentor to task. And so it goes. Surfers with patience will find useful information on E-town's message boards, but they'll have to filter out the noise first. Happily, manners in cyberspace have improved markedly in the past few years, and this sort of nonsense is becoming less common.

The discussion at the Home Theater Forum is far more civilized—the site won't tolerate personal attacks—and its participants are generally well informed. In addition to welcoming opinions on a multitude of topics, the site has a small number of equipment reviews. This is a good place to pose any questions you have about home theater or to find out about others' experiences with products you're thinking of buying.

SMR Home Theatre on the World Wide Web is run by British technology journalist Stuart Robinson. Equipment reviews are as varied as the contributors themselves; most are written in a conversational tone and, as with most online A/V magazines, are subjective.

You'll find reviews of products as varied as a Panasonic DVD player, several models of Polk Audio and NHT speakers, and a Conrad-Johnson integrated amplifier. This site has a policy of posting only positive reviews, not because it's "sold out" (it doesn't accept advertising) but because its contributors don't solicit review samples of products they're dubious about. In fact, I think



The real attraction of the Internet is the ability to find information that's simply unavailable on the newsstand.

are obviously prejudiced, this is a great place to find out about others' experiences with equipment you may be considering. There's also an extensive set of links to manufacturers' sites plus a section for buying and selling used gear.

Audio Revolution bills itself as "The World's #1 AV Publication on the Internet." But there are other pretenders to that

published in *Twice*, a consumer electronics trade publication. Some stories have a mannered, consumer-watchdog tone, while others fall into the gee-whiz category. Most are nicely written and timely, and some are genuinely insightful. If you want instant coverage of a major event, such as the Consumer Electronics Show, E-town is a good place to look. On the other hand, its mes-

this site occupies a higher moral ground than most high-end magazines, whether print or online. It doesn't promote expensive gadgets of questionable utility; some of its articles actually debunk the myths behind these gizmos. One article explains anamorphic DVD video; others tell readers how to banish ground loops from their systems and offer suggestions on speaker placement for different room layouts. These articles alone make SMR Home Theatre well worth visiting.

SoundStage! calls itself "the Internet's leading online high-end audio, music, video and home theater site." That claim gives you a clue as to this Canadian site's strengths and weaknesses. Like the description itself, the site could benefit from a firm editing hand. Too often, the conversational writing style rambles. That's bad enough in print but, given the limited attention span most people have when reading from a computer screen, downright irritating online. Some pages also have animated advertisements all around the perimeter, making

for a site that is not always terribly readable. One of this site's strengths is that it is comprehensive.

You'll find DVD reviews, music reviews, and, of course, equipment reviews—some of products you're unlikely to see tested elsewhere. The December 1998 edition, for example, included reviews of a Bel Canto Design integrated amplifier and RFI filters from Versalab. The approach is heavily subjectivist but clearly based on careful listening/viewing. To one (like me) who questions the claims of many cable and accessory manufacturers, some of the reviewers seem awfully credulous, buying into all kinds of gimmicks (e.g., expensive AC cables for components). Other SoundStage! contributors, however, take these claims with a grain of salt, though you have to read between the lines to fully register their skepticism.

Schneider Publishing, the company behind SoundStage!, recently launched several related sites. One, SoundStage Live!, contains news from trade shows and other industry events plus forums for readers; an-

CAVEAT EMPTOR: SHOPPING ONLINE

The Internet is a great source for product information, and it can also be a good place to buy A/V gear. Internet merchants often have lower prices than conventional stores. And if you're dealing with an out-of-state company, you'll usually avoid paying sales tax, although shipping charges may offset this saving.

A few of the many companies that sell mainstream equipment over the Web are Crutchfield, J&R Music World, One Call, and Sound City (see the box at the end of this article for addresses). High-end equipment is available online through Audio Advisor, and there are specialized Internet merchants, such as Cassette House (blank recording media), Digital Eyes (DVDs and laserdiscs), and Minidisco (MiniDisc equipment as well as accessories).

You can also find used equipment online. Audio Review and Audio Revolution both have classified ad sections, and used equipment is often advertised on the newsgroups. At Audio Shopper, you'll find thousands of classified ads for used gear.

When selling online was beginning to take off a couple of years ago, people worried about con artists intercepting credit-card information and using it to rack up charges. That risk was never very great; now that most Internet merchants use secure servers, it's minuscule. (With a secure connection, your Web-browsing software encrypts information before it's sent out onto the Net, and the merchant's server decrypts it. Encryption comes in 40- and 128-bit flavors, with the latter, obviously, being better.)

The main risks of Internet commerce are the same as phone and mail ordering. Will the merchant actually ship the product? What happens if it's defective? What happens if it's lost in transit? What happens if it has to be repaired under warranty?

Problems like these are the exception, but they do occur. Last fall, some customers of a California company called MiniDisc Now (MDN) had their credit cards billed for products they ordered but that MDN did not ship. According to information posted on MDN's Web site, MDN's merchant provider (a company that processes credit-card transactions) did not forward proceeds of customer transactions to MDN, apparently in a dispute

over chargebacks from card issuers. MDN says many of these chargebacks resulted from credit-card fraud.

There are several steps you can take to minimize the risks of online shopping:

- Make sure the merchant is an authorized dealer for the product you're buying and that the product comes with a U.S. warranty. If you're buying products intended for offshore markets, that probably won't be possible, in which case the merchant should make it clear how it will handle repairs and warranty claims.

- Ask about the merchant in newsgroups and message boards. Are its customers happy with the service they received? Were products shipped when promised? Were problems dealt with quickly?

- Be suspicious of prices that are dramatically lower than those available elsewhere.

- If you're paying by credit card, make sure the merchant has a policy of not billing until goods are shipped. And make sure all the terms are completely clear: the total cost (including shipping and handling), return policies, warranty, etc. Terms are usually posted on the site.

A credit card is probably the safest way to pay for online purchases. If you don't receive the goods, you can complain to the card issuer. Then, if the merchant can't prove to the card issuer that you ordered and received the goods, a chargeback will be applied and your account credited. But the process involves a fair bit of time and hassle. However, if you've paid by check or money order, you have no such recourse. With C.O.D. shipments, you at least know you received a package, but you can't see what's in it until you've paid the carrier (usually by cash, certified check, or money order).

Unless you're buying from a dealer, credit cards are rarely involved in used-equipment purchases. While some sellers will ask for cash up front, C.O.D. is usually acceptable, but, as stated above, there's no chance to inspect goods before paying for them. And because the condition of used merchandise varies far more than the condition of new equipment, your best bet is to buy from a seller that is within driving distance so you can check out what you're buying before you pay for it.

G.B.



ALL THE NEWS THAT'S FIT TO SHARE

The two most popular uses of the Internet are e-mail and the World Wide Web. But it's worth exploring another Internet service, Usenet newsgroups. These work like the message boards found on many A/V-related Web sites. Someone starts a discussion thread, others jump in with their responses, and still others respond to the responses.

Whereas comments to Web-based message boards sit on the server that hosts the Web site, Usenet messages work more like e-mail. When someone posts a message to a newsgroup, it is sent to all of the Internet services that carry that newsgroup; then it sits on the provider's news server, along with all other postings for that newsgroup. To access Usenet newsgroups, you need a piece of software called a "news reader," which tells your Internet provider what newsgroups you want to subscribe to. Thereafter, whenever you're online and want to read your newsgroups, new messages are downloaded to your computer. You can download entire messages or just the "headers" (descriptions of what's inside the messages).

In newsgroups, you'll find information about used equipment for sale and people seeking it. (I saw adjacent messages, for example, offering a 1946 wire recorder and a Nakamichi Dragon cassette deck.) People seeking and offering opinions on specific com-

newsgroups, you can get a real-world user's perspective.

In the following list of A/V-related newsgroups, the content should be self-evident:

alt.home-theater.announce
alt.home-theater.marketplace
alt.home-theater.misc
alt.music-lover.audiophile
alt.music-lover.audiophile.hardware
alt.video.digital-tv
alt.video.dvd
alt.video.dvd.software
alt.video.dvd.tech
rec.audio
rec.audio.high-end
rec.audio.marketplace
rec.audio.misc
rec.audio.opinion
rec.audio.tech
rec.audio.tubes
uk.rec.audio

Discussions also take place on the message boards of A/V forums on the commercial online services. These include the *Stereo Review* and *Car Stereo Review* areas on America Online and the consumer electronics forums (CEAUDIO and CEVIDEO) on CompuServe. G.B.



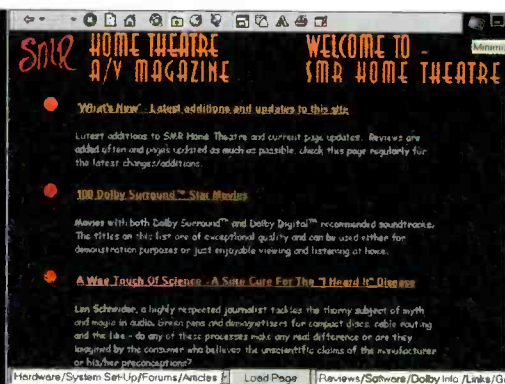
ponents, plus those asking for and providing advice on solving system problems, are online as well. The discussions are as varied as the individuals taking part in them. Because newsgroups aren't moderated, they're sort of the wild frontier of the Internet. Some boors do hang out on the A/V newsgroups, but most of the discussion is surprisingly reasoned, informed, and polite—though there is a fair bit of off-the-cuff opinion. From

other, GoodSound, offers reviews of more affordable equipment than the high-end gear featured on SoundStage!. Neither SoundStage Live! nor GoodSound is as visually distracting as the main SoundStage!

Of the sites devoted to DVD, my favorite is the DVD Resource Page. This is a labor of love for Steve Tannehill, who toils as a software engineer in Dallas by day and watches movies and writes articles about them by

also find useful background articles on such subjects as Easter eggs (hidden features in DVDs) and anamorphically squeezed discs.

For an even newsier approach to DVD, point your browser at The Digital Bits. The



site. The reviewing approach and writing style, though, are much the same.

In addition to broad-appeal online electronics magazines, there are several sites with a more specific focus.

night (or very early morning). Besides its more than 250 perceptive DVD movie reviews, you'll find DVD-related news, updated daily, and a forum where you can ask questions and answer other people's. You'll

news stories and well-written rants by Bill Hunt, who owns and maintains the site, are updated daily. Last summer, Digital Bits had daily reports from the Video Software Dealers Association convention in Las Vegas, outlining film studios' plans for DVD.

Another section lists planned DVD releases by the studios. In addition, there are movie reviews and a limited number of equipment reviews plus links to many other DVD-related sites.

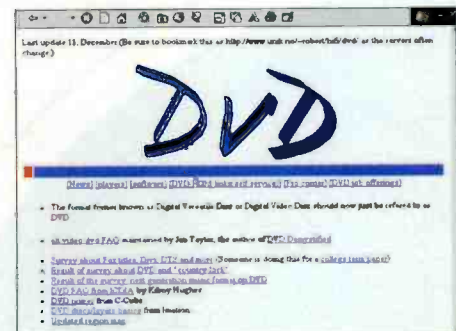


While the movie reviews at The DVD Post are generally mundane, this site is still worth visiting for its extensive list of current and upcoming DVD titles and its list of DVD rental locations.

MiniDisc fans should check out the MiniDisc Community Page. This is the work of Eric Woudenberg, a Bell Labs research scientist who became interested in MiniDisc during a six-year stint in Japan. The site has an extensive list of MiniDisc products (including photos and, in some cases, reviews contributed by readers) and links to other MiniDisc-related Web pages. Most interesting, however, are the frequent updates contributed by Woudenberg and his readers. One recent intriguing item described a TOC extender that lets you get 80 minutes of stereo audio onto a 74-minute disc. Unfortunately, you need a special master disc, and there was no hint as to how to get one.

A private site maintained by Peter Kant has well-considered, well-written FAQ (frequently asked questions) pages about all types of audio components. The now-retired Kant formerly worked as a recording engineer for Bulgarian State Radio. This is a good site for anyone who wants to bone up on some basic audio theory or needs helpful advice.

Several industry and professional associations' sites are also worth checking out. The Audio Engineering Society's Web site has information on the organization and its publications (including its preprints of convention papers, which can be bought through the site). The site of the Academy



WEB ADDRESSES

Academy Advancing High Performance Audio & Video
www.avacademy.com

Audio Café www.audiocafe.com

Audio Engineering Society

www.aes.org

Audio Review www.audioreview.com

Audio Revolution

www.audiorevolution.com

DVD Post www.dvdpost.com

DVD Resource Page

www.dvdresource.com

Digital Bits www.thedigitalbits.com

E-town www.e-town.com

Steve Ekblad's private site

www.wssh.net/~wattsup/page3.html

Enthusiast's Page

www.audio-hometheater.com

GoodSound www.goodsound.com

HiFi on WWW

www.unik.no/~robert/hifi/hifi.html

HiFi on WWW's DVD site

unik.no/~robert/hifi/dvd

Home Theater Forum

www.hometheaterforum.com

Peter Kant's private site

www.home.inreach.com/kant

MiniDisc Community Page

www.connect.com/~eaw/minidisc/
whole_page.html

SMR Home Theatre on the World

Wide Web www.smr-home-theatre.org

SoundStage! www.sstage.com

SoundStage Live!

www.soundstagelive.com

Stereo Review's Sound & Vision

www.soundandvisionmag.com

DEALERS

Audio Advisor www.audioadvisor.com

Audio Shopper

www.audioshopper.com

Cassette House www.tape.com

Crutchfield www.crutchfield.com

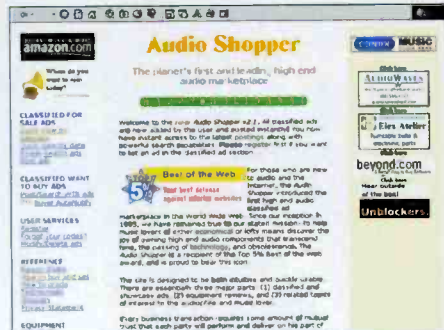
Digital Eyes www.digitaleyes.net

J&R Music World www.jandr.com

Minidisco www.minidisco.com

One Call www.onecall.com

Sound City www.soundcity.com



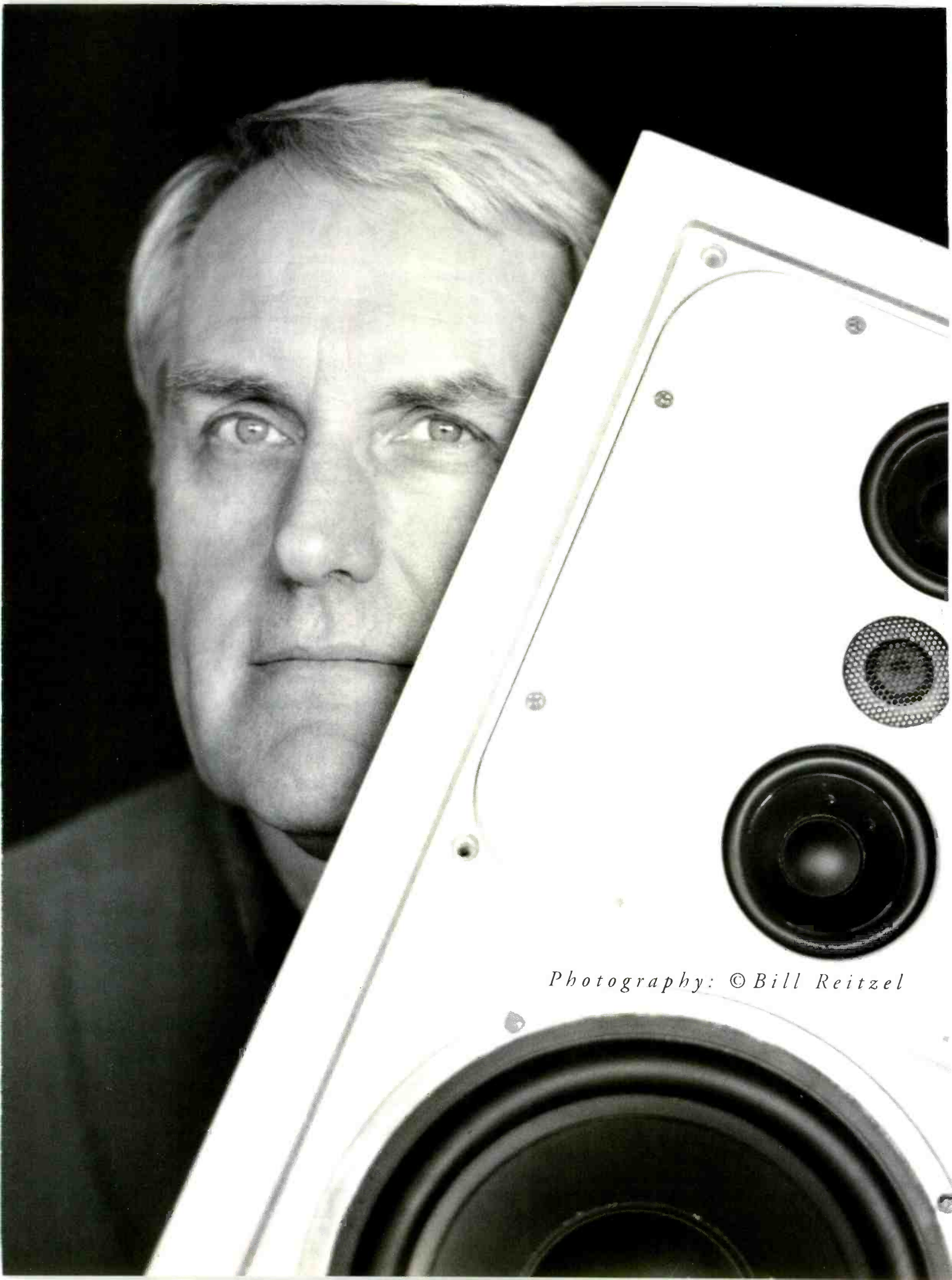
Advancing High Performance Audio & Video contains A/V-related news stories and links to member companies.

If any site whets your interest in a new component, information is a mouse-click or two away. Not only is the Internet the world's biggest newsstand, it's also the world's biggest brochure rack. Almost all equipment manufacturers have Web sites where you can get product info and read product reviews. Most also list their dealers, so if you want to hear the product in question, you can usually find a retailer near you.

There are far too many manufacturers on the Web to list here. Fortunately, besides the company listings at the back of *Audio's* Annual Equipment Directory (in the October issue), there are several sites that do just that. The Enthusiast's Page is a well-maintained site with more than 2,000 links to equipment manufacturers, dealers, and organizations involved in consumer electronics. You'll also find links to manufacturers' pages at a site maintained by Steve Ekblad, who works for a Chicago-area audio chain. Another great source for links to manufacturers is a Norwegian site called HiFi on WWW. A related site has links to just about everything published about DVD.

It's easy to spend hours surfing through online magazines. And once you get to the manufacturers' sites, those hours can turn into days. So make sure your Internet provider gives you a liberal amount of monthly connect time. And make sure you leave some time for listening to music and watching movies!





Photography: © Bill Reitzel

Laurie Fincham

of

THX[®]

by David Lander

When high fidelity was in its infancy, hobbyists and manufacturers alike looked to film sound for inspiration. The first hi-fi systems that Avery Fisher cobbled together for friends had second-hand movie-house amplifiers. JBL and Altec, both makers of theater speakers, were important names.

Decades later, the power and the glory that high fidelity had come to enjoy began infiltrating the film industry. Cerwin-Vega provided theater speakers and amplifiers for the sonic stunner *Earthquake*. More important, Dolby Laboratories, well known in hi-fi for its system that reduced tape hiss, developed Dolby Stereo, a convenient way to bring genuinely high-fidelity four-channel sound to movie theaters.

In 1977, George Lucas's *Star Wars* was released in Dolby Stereo. It hit like a thunderbolt, and multichannel movie sound rocketed to the forefront of public consciousness. Today, with dynamic soundtracks fueling record-setting box office receipts and home theater booming, a circle has closed. And because it now appears that few people will buy separate audio-only

home entertainment systems, established film-sound parameters are certain to influence the anticipated standard for multichannel music recording. The movies are poised to influence hi-fi's future once again.

Laurie Fincham is uniquely positioned to understand both the world of high fidelity and that of cinema sound. An internationally recognized loudspeaker engineer who, during a 25-year stint with KEF, pioneered the use of computers in speaker design and evaluation, Fincham is a recent emigrant in two senses of the word: In 1993, he relocated from his native England to California to become Senior Vice President of Engineering at Infinity Systems. After more than four years there and a few months as an independent consultant, he crossed another border and joined Lucasfilm as Director of Engineering for its THX division.

Since January 1998, Fincham's job has been to further the THX mission: assuring that multichannel movie soundtracks are heard, both in commercial and home theaters, in precisely the manner their creators intended.

D.L.

The first standards for film sound were laid down by the movie studios, which owned the theaters where their films were shown and had control over how their soundtracks were replayed there. In the 1950s, after the government cried antitrust and forced the studios to divest themselves of theaters, the Society of Motion Picture and Television Engineers provided standards. But these didn't satisfy George Lucas, who, in 1982, started THX to assure that the effects he and his fellow filmmakers put on their soundtracks would be faithfully reproduced in theaters. In 1990, that program was extended to home theater equipment through a licensing program that allowed manufacturers to display the THX logo—provided their equipment met certain standards, which involved proprietary technologies. Would you explain these technologies briefly, beginning with crossover networks?

THX was the first, really, to formalize and refine the use of active crossover networks for movie sound. It specified particular filter shapes and, perhaps more important, introduced the idea of delay sections, so that there could be time alignment between the various drive units in a cinema loudspeaker system.

What, specifically, is re-equalization?

During the recording process, film sound is usually balanced with boosted high frequencies. This compensates for the inevitable high-frequency attenuation that occurs in the theater, because of listening distance and absorption. As a result, when a soundtrack is replayed in the home, it often sounds too bright. Re-equalization corrects this, so you hear the same thing in the home as you would in the cinema.

And timbre matching?

In a surround sound system, the surround speakers are often at the sides of the listener or even behind him. Timbre matching is a process whereby the sound quality of the surround speakers is adjusted until it matches the timbre of the front speakers and compensates for their different positions within the room.

And decorrelation?

Decorrelation is a process that ensures the surround speakers will produce the correct spatial effect under all conditions. With the original Dolby Pro Logic system, we had the two rear speakers producing a double mono signal that resulted in a phantom image—a big, lumpy, soggy thing—that didn't externalize correctly. Essentially, the decorrelation circuit looks for the similarity between the two surround signals and then alters their relative phase response. The signals are spread across the rear soundstage, and you don't get this localizable lump. It continues to be a relevant process, because

many films are available with only the original Dolby Surround soundtrack.

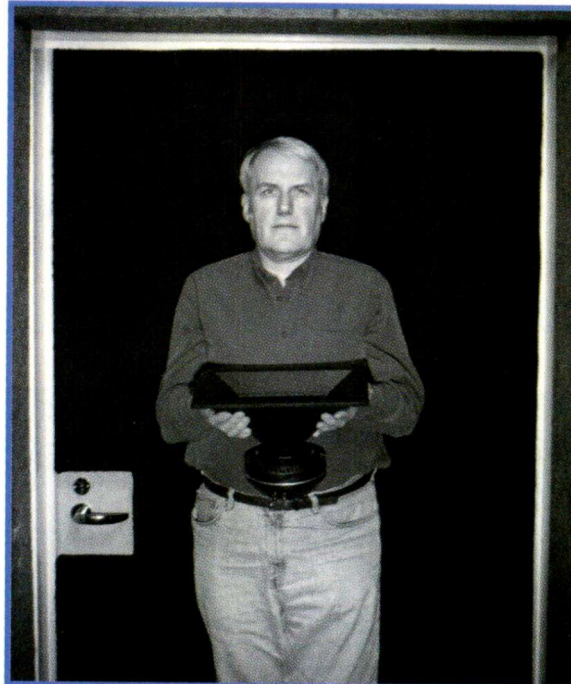
You also specify a form of peak management.

In 5.1 soundtracks, there's often a great deal of bass information. The peak management system automatically protects the subwoofer from overloading.

What is speaker position time synchronization?

Not all speakers are equidistant from the listener. When there are significant differences or you're sitting in some asymmetric way, it's important to resynchronize the sounds, through the use of delay circuitry, to make sure they arrive in the right order.

THX recently devised a new set of standards called Select and renamed the original set THX Ultra. Why?



The Select specification allows design economies by modifying performance requirements to fit a new set of conditions. It was based on the premise that not everybody has a large listening room or the desire to hear sound played at the same levels as in a theater, which was the purpose of the original THX specification. We did a lot of testing to find out how receivers worked—with real music, not sine waves—and came up with a spec aimed primarily at very good but affordable receivers. We retained the patented technologies, so you had everything you had before except you had it all in one box. This was coupled with the recognition that a more typical room would be closer to 2,000 square feet than 3,000. The smaller room brings about two things: First, the same amount of power out-

put from the speaker results in a higher listening level—you can actually turn the volume *down* and still have the same level. Second, in a smaller room, because you're going to be somewhat closer to the speakers, the reflected sound is of less importance. That meant we could relax some of the

Quite a lot of what we're doing is on how people hear sound and the way they react to it.

directional requirements of the speakers—which had led to considerable complexity and cost—without reducing their sound quality. We also included in the Select specification an alternative category for monopole surround speakers. Providing it was designed correctly and had the correct timbral match to the front speakers, a monopole would be a very good, cost-effective alternative to a dipole.

In addition to setting standards, THX goes so far as to research circuit designs. Why?

You can't just write a standard from a lofty height. You've really got to be practical and design something that makes sense from a manufacturer's point of view as well as from a performance point of view.

You've said you do a lot of incidental research as well.

You can't test things without knowing how they work. Quite a lot of what we're doing is on how people hear sound and the way they react to it. Because we have Skywalker Ranch, which is one of the busiest and most important cinema-sound establishments in the country, we get to talk to the sound designers about what they're doing and how they do it. A large percentage of the most important films are mixed down at the Ranch, so we have the opportunity to see and hear this stuff firsthand.

How many engineers does THX currently employ?

Ten.

Is the division involved in manufacturing?

On the professional side—digital crossovers, analog crossovers, little monitoring systems for multichannel recording. We design a few things like that, have them made for us, and test them all here. It's generally in new categories that we would do this. Let's say we see a part of the business emerging where there are no established standards. Simply writing a standard is not sufficient if the specified equipment isn't available. If necessary, we satisfy that need.

What does the theater alignment program involve?

TAP is a quality-control service for theaters. We go in and actually do a great raft of tests, not only to maintain and quality-assure film sound but also to maintain picture quality.

THX gets involved in the design of specific theaters, does it not?

Yes. We have a design department that goes through architects' drawings and makes recommendations on shape, layout, acoustic treatment, number of speakers, size of amplifiers, and so forth. If it all goes ahead, they get the stuff installed and we send a technician over to certify the thing. We do measurements in the hall and on the electronic equipment. To date, we have certified about 3,000 theaters around the world.

And there's a digital mastering program.

We supervise the transfer, via telecine, of the original film to a digital master tape from which we are able to make dubs for producing DVDs, laserdiscs, and VHS tapes. It's another part of the chain, if you like: the optimum transfer from film to a digital master tape.

THX recently announced a service called PM3. What is it?

PM3 stands for "professional multichannel monitoring and mixing." It's a design and consulting service for recording studios that need 5.1-channel capability for film, video, and TV, and it's derived from our 10 years of experience in theater construction as well as nearly 10 years in high-end home theater. Also, we gained a great deal of experience at Skywalker Ranch, where many rooms are used for monitoring and it's essential that they're similar in sound quality. From this experience, we wrote a set of standards that tells people how to build their own rooms for monitoring purposes yet maintain a consistency in performance. So it's a consulting service, and part of what we do is provide customers with standards they should adhere to for the replay equipment, the room layout and acoustics, the distance from the listener to the screen, and so forth. These standards will also be applicable to multichannel music recordings.

What are the implications for home music listeners?

When multichannel sound becomes the standard, there will be conditions under which it can be recorded. That means, in our

Home THX program, we can pretty well guarantee our replay system will do the best job with multichannel music.

In the absence of a multichannel music recording standard, we're seeing more and more speakers optimized for movie soundtracks. Does this have negative implications for serious music listeners?

While all this settles down, I think, you are going to get home theater systems optimized for film soundtracks, particularly spectacular soundtracks. In the same way that some speaker and replay systems were optimized for rock 'n' roll, you could argue that some home theater systems are optimized for Bruce Willis. They're not for sonic purity, because it's all biff, bang, wallop, but I think it just reflects the infancy of that particular part of the industry.

Will sonic purity eventually play an important part in films?

As sound designers become more familiar with the possibilities of multichannel soundtracks, there will be less concentration on the obvious novelties and it will mature—much the way stereo did, away from the sound of passing trains and games of Ping-Pong. The film industry won't be resolutely directed at blockbusters for 17-year-olds. There will be other, thoughtful films, where what the actors are saying is as important as what they're blowing up.

And music will be a key element of at least some of these movies.

Absolutely. Even from a commercial point of view, *Titanic's* success was as much to do with the voice on the single that came out of it as it was to do with the film. In other movies, probably more so: The music in *Rob Roy*, for example, had some very nice orchestral bits in the beginning, with some lovely shots of Scotland.

How will speaker design reflect this? You maintain that most—not all, but most—speakers are ultimately optimized for the kind of program material favored by the largest number of people. The segment that prefers orchestral film sound to special effects, however, is likely to be relatively small.

The point about optimizing a speaker for one particular application is that, in the end, that's the only thing it's good for. My view is very simple: All speakers should be completely neutral transmitters of the original program material. Neutrality relates to the timbral balance, which in turn depends not just on frequency response but also on the speaker's directional characteristics. With existing film soundtracks, dipoles are an excellent choice for surround speakers. In the future, the nature of soundtracks may change, so it's important that we develop systems that have an inherent flexibility, that do the best possible job with any source material. I'm suggesting that the directional characteristics of speakers be variable, so they can change to suit the particular program material being replayed.

What will trigger the required changes?

I believe DSP will be the key to that. There will probably be some flag encoded in the program material that tells the speakers to have a particular directivity for a particular application. That would be much more sensible than having everything polarized, where you could play this material or that material but not both. You don't want to have a speaker that is one-size-fits-all.

Are speakers with variable directionality part of the industry's future?

Technically, there's absolutely no reason why it shouldn't happen. And since it could happen, it probably will.

As multispeaker systems are currently configured, how important are the various channels?

Ranking the reproducing channels in order, I would say that the center channel is most important, followed by the subwoofer and the surrounds. The reason I choose the center channel is because it contains the dialog, which allows you to follow the film. A lot of soundtracks are difficult to follow anyway, so it's very important that the reproducing system doesn't add to that difficulty.

How crucial is a center channel to music listening?

I'm biased here. I think the center channel is really a good thing, and I think everybody will be grateful for it in a few years—once they get used to the idea of more speakers. They'll find that their overall enjoyment of the performance is greater, and greater over a wider listening area. Clearly, the center channel does a much better job with center images, but more important than that, it has a more accurate timbral quality that cannot be achieved with a system in which the left and right channels are creating a phantom image. That's particularly true on voices. If you doubt it, turn the balance control and take the sound out of one speaker. That will always sound more accurate.

Audiophiles make a big fuss over imaging, but you tend to minimize its importance. Why?

I think it's true to hi-fi, not to a musical performance. Two-channel stereo was always going to be a compromise, but in the end, that compromise became an art form in itself.

Part of which is setting the system up precisely and, even then, being limited as to where the listener sits.

I call it hair-shirt audio. It's a difficult thing to enjoy in a social way. It's okay for one man or one woman, but it's difficult for it to be a group experience. Home theater is a family-type thing. Two-channel stereo has become more and more accurate about less and less; that's the way I feel about it. In the end, music is to be enjoyed. Nothing must grate on you. There are aspects of multi-channel sound that are really rather pleasant. In some cases, they're more true to life, but if they can't be true to life, let them be pleasurable.

You've said that multichannel sound has a "womb effect."

Yes. It surrounds you. It's warm, comfortable, enveloping—a wholly pleasurable experience. It isn't a very difficult thing to enjoy. It's not a super-aesthetic thing. Nowadays, probably, more people listen to music in cars than at home. In a car, stereo accuracy is nearly impossible, yet despite this, the overall effect is extremely pleasant. It's enjoyable because it's all around you.

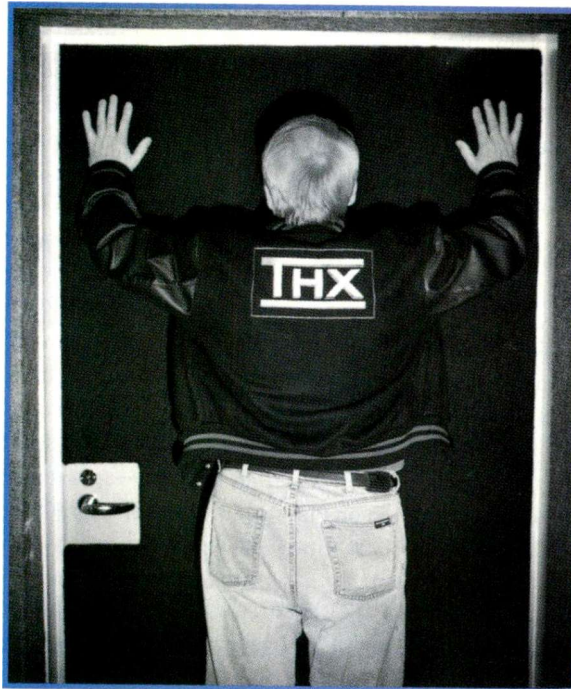
What advice would you offer engineers who previously designed

speakers for music and will now have to add film sound to the mix?

Don't ever give up on the things you thought were important. Keep on doing what you did before, but be mindful of the special demands of the soundtrack. I've always argued that a home theater system isn't different; it simply wants more. In other words, there are greater demands in terms of bandwidth and level. And probably the speakers have to be rather more efficient than regular hi-fi speakers to prevent having a room full of power amplifiers.

You've cited the "sheer intrusiveness" of multiple speakers in a room. How can that be minimized?

Installing in-wall speakers is a really good way if you don't mind making a commitment to keeping your house. There are now excellent-quality in-wall speakers. We have certified in-walls for the left,



center, and right channels as well as for the surrounds. And clearly there will be improvements in the way you get your sound around to the various speakers in the room. There'll probably be daisy chains with digital links or something like that, so you won't have to run scads of wires from your central receiver or multiple amplifiers. There are experiments with wireless links; they tend to be a little bit on-and-off in quality or rather expensive, but they will get better, because the need to drive information around the house is going to become ever greater. And when it does, it's going to make speakers neater and tidier to incorporate. That's a key issue: How do you make speakers smaller and less obtrusive yet at the same time keep the quality up?

How do you?

I think you do it by caring, as much as anything else. If you care enough about it, you'll find a solution to it.

Can virtual channels be used for serious music listening?

Absolutely. In a way, you'd almost be going back to two-channel stereo. What I mean by that is, these virtual systems do depend

very largely on your being at a specific position with respect to a limited number of speakers. But if, for other reasons, you're happy to sit there, the effects are quite outstanding; they're less dependent on the acoustics of the room than practically any other system. You can have two speakers that are no more than 6 or 8 inches apart and do all this. It's absolutely amazing.

Given the innovations digital technology has produced, where do you expect the best-sounding new speakers to come from?

The independent designers will have to carry the torch for good sound. The reality is that most loudspeaker designers do as they're told.

A

Two-channel stereo was always going to be a compromise, but in the end, that compromise became an art form in itself.



HIGH-END SOUND FOR THE REAL WORLD

If you're not inclined to spend several thousand dollars on a set of high-end speakers, don't worry. You don't have to.

Paradigm® Reference speakers... eminently satisfying state-of-the-art sound that heightens the sheer enjoyment of music and home theater.

Visit your nearest Authorized Paradigm® Reference Dealer today and experience these spectacular speakers for yourself.

Compare them to the most expensive speakers you can find. You'll be amazed.

www.paradigm.ca



PARADIGM® REFERENCE
THE ULTIMATE IN HIGH-END SOUND FOR MUSIC AND HOME THEATER™

In the US, contact AudioStream, MPO Box 2410, Niagara Falls, NY 14302 tel 905.632.0180
In Canada, contact Paradigm, 205 Amnagem Blvd., Mississauga, ON L5T 2V1 tel 905.564.1994
Copyright ©1998 Paradigm Electronics Inc. and Baxson Corp.

EDWARD J. FOSTER

SONY TA-E9000ES A/V PREAMP



To call Sony's new TA-E9000ES pre-amplifier "full-featured" verges on understatement. That might not be immediately apparent from the deceptive simplicity of its front panel, but it's hinted at by the panel's string of logos (Dolby Digital, DTS, and MPEG Multichannel). To decode those surround formats, the 9000 has a 32-bit floating-point processor (the first such DSP chip used in a home high-fidelity component, Sony says). A pair of 32-bit fixed-point DSPs add the usual enhancements and embellishments (and then some). This pre-

amp's innovative controls and setup facilities include a novel volume-control circuit. As a preamp should these days, the 9000 has plenty of analog and digital audio connections and analog A/V connections. And then there's the remote, which more than deserves to be called full-featured in its own right.

Whatever your choice of program sources, the TA-E9000ES will likely accommodate them very well. On the audio front, it has analog connections for a moving-magnet phono cartridge, a tuner, a CD player, and two recorders (nominally designated "MD/DAT" and "Tape"). Its A/V connections include inputs for three sources and inputs and outputs for three video recorders. Sony also offers digital audio inputs for four

sources and a digital output for the "MD/DAT" recorder. (This output can be used only for digital sources; the signals the 9000 digitizes from analog sources are not fed to this jack.)

The TA-E9000ES has Toslink optical connectors for all digital inputs (and for the "MD/DAT" digital output). The "CD" and "DVD" inputs also have S/P DIF coaxial jacks, and the laserdisc ("LD") input has coaxial jacks for S/P DIF and AC-3 RF signals. (While I'd like to see coaxial and optical digital connectors for every source, having three such inputs gives the 9000 an edge over much of its competition.) All coaxial connectors and the "DVD" Toslink input can handle sampling rates from 32 to 96 kHz and word lengths up to 24 bits, but the remaining optical inputs cannot.

Analog line outputs are provided for two powered subwoofers and two center-channel power amplifiers; there are single outputs for each left and right front and surround channel. On the A/V side, the TA-E9000ES has outputs for two video monitors. There's an external video "Processor" loop, into which you can connect a titler, a composite- to S-video converter, or other video components. Because the processor loop precedes the video recording outputs, whatever the processor does to the picture can be recorded as well as displayed—a rather nice and thoughtful touch.

Without exception, every video input and output accommodates composite- and S-video signals but not component-video signals. The omission of component video follows the pattern of most A/V components rather than leading the way, as a component of the 9000's stature should.

It is time for the audio industry to come to grips with reality, acknowledge the benefits of component video, and provide for it.

The list of audio, video, and digital jacks (all gold-plated, by the way, for better reliability) does not quite cover all of this pre-amp's rear-panel connectors. On the mundane side, there are two switched AC convenience outlets with a 1-amp total rating. A bit more interesting are the jacks for

**THE TA-E9000ES
IDENTIFIES AND
DECODES WHATEVER
SURROUND FORMAT
YOU FEED IT.**

Dimensions: 17 in. W x 6 in. H x 15¼ in. D (43 cm x 15 cm x 38.7 cm).

Weight: 28.2 lbs. (12.8 kg).

Price: \$1,700.

Company Address: 1 Sony Dr., Park Ridge, N.J. 07656; 201/930-1000; www.sel.sony.com.

the S-Link control system, for daisy-chaining with other Sony products (such as its TA-N9000ES five-channel power amp, CD players, and recorders) and operating them all from the preamp's remote. A separate jack enables a Sony TV to turn on when the preamp does.

But what really caught my eye on the back were a mini-jack labeled "Analyzer/MIC In" (sic) and an RS-232C D-connector. Both are reserved for "use with future upgrades," though it doesn't take much foresight to imagine what they might be. The TA-E9000ES's operating software is

**I'M IMPRESSED
BY THE SONY'S
INTUITIVE CONTROLS
AND THE CLARITY
OF ITS DISPLAYS.**

stored in an 8-megabit flash memory that's accessible via the RS-232C jack, so software upgrades are an obvious possibility. With new software and a test microphone, automated speaker setup—even correction of room acoustics—might be feasible. With its two Sony 32-bit fixed-point DSPs and a new Analog Devices ADSP21062 SHARC 32-bit floating-point DSP, the 9000 has the computational horsepower to do a lot of digital processing. Right now, that horsepower is dedicated to decoding Dolby Digital, DTS, and MPEG surround bit streams (the "SHARC" chip does that) and to generating more tone-control functions and soundstage processing options than many people would find use for. New software could reconfigure the 9000 to do other things. But I'm getting ahead of myself!

As it stands, the TA-E9000ES identifies and decodes whatever surround format you feed it (as well as mono or stereo MPEG, DTS, and Dolby Digital bit streams), illuminating legends in the display to show the signal format and which speakers are being used for it. For example, a 5.1-channel bit stream will turn on the "L," "C," "R," "LS," "RS," and "L.F.E." (low-frequency effects) legends if your setup includes speakers for them but will light only the "L," "C," and "R" legends (and fold surround information into the left and right front channels) if

you have no surround speakers. If you have surround speakers but no center, the same signal will light up all but "C" and fold the center-channel information equally into the left and right front channels. Even if you have all five speakers, however, a digital signal containing fewer channels will cause only the legends for the speakers required to light up.

You can opt to treat two-channel digital or analog signals as stereo or process them as Dolby Pro Logic. If you treat the signal as Pro Logic and you're using a five-speaker array, the "LS" and "RS" surround legends darken; a single "S" legend glows, indicating a monophonic surround channel.

In addition to straightforward surround decoding, the TA-E9000ES offers more DSP-enhanced cinema modes than you can shake a stick at. Since these "enhancements" are calculated with 32- rather than 24-bit precision, Sony claims that their resolution is far better than you'll find in competitors' equipment. Three of the DSP embellishments are based on the acoustics of several venues at Sony Pictures Entertainment (the Cary Grant Theater, the Kim Novak Theater, and the Music Scoring Stage). Others include "Night Theater" ("retains a theater-like environment while listening at low volume levels"), "Mono Movie" ("creates a theater-like environment from movies with monaural soundtracks"), and "Stereo Movie" (which does similarly for stereo soundtracks).

The TA-E9000ES has virtual surround modes to simulate the presence of more speakers than you're using. With a single pair of surround speakers, you can simulate three sets—or five sets elevated approximately 30° above the listeners. Other modes simulate surround with only front speakers, taking the three front channels' sound to create one or three sets of virtual surround speakers. Because Sony uses two 32-bit DSPs in parallel to create

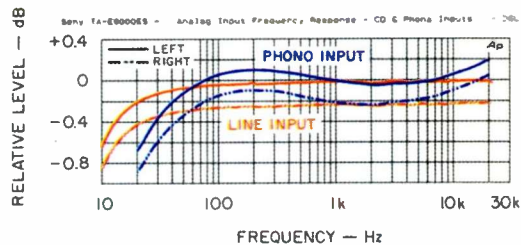


Fig. 1—Frequency response, via analog inputs.

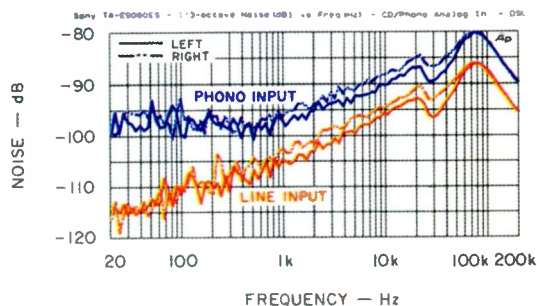


Fig. 2—Noise analysis, via analog inputs.

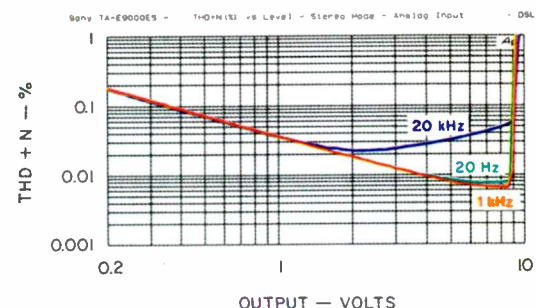


Fig. 3—THD + N vs. level, via analog input.

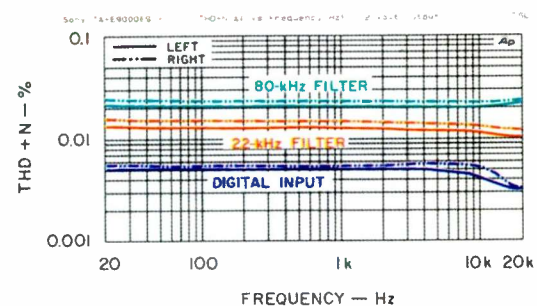
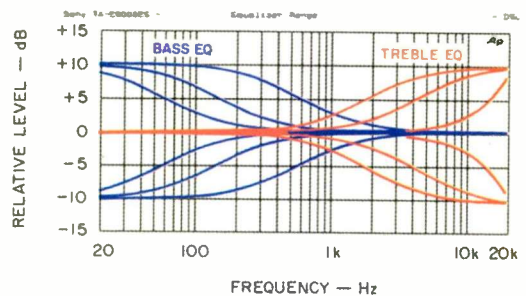
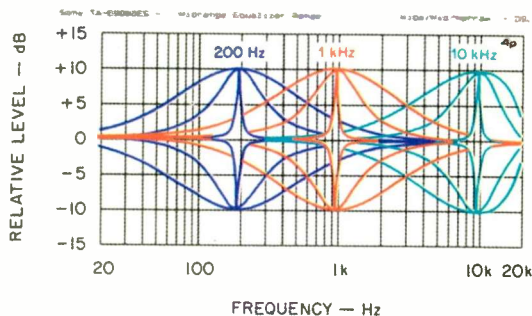


Fig. 4—THD + N vs. frequency at 2 volts out, via analog inputs (at two test-filter settings) and digital input.

the ersatz sound fields, they can even be layered one upon another, combining the acoustics of one of Sony Pictures' sound stages with your choice of virtual surround speakers.



A



B

Fig. 5—Characteristics of bass and treble controls (A) and of midrange parametric equalizer (B).

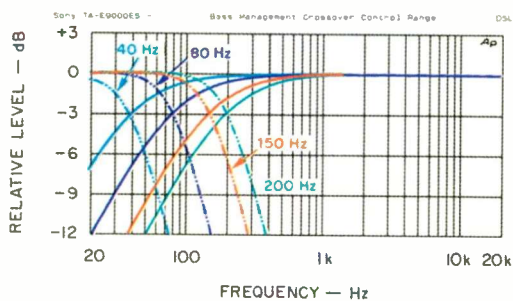


Fig. 6—Crossover responses.

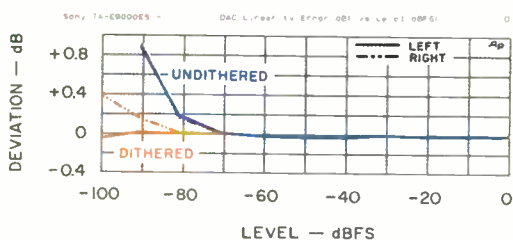


Fig. 7—DAC linearity.

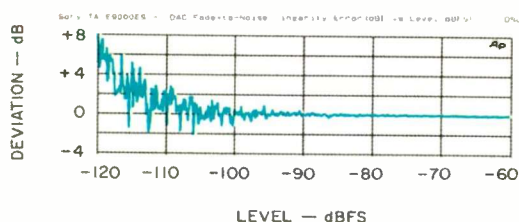


Fig. 8—Fade-to-noise test.

All told, this preamp offers 17 DSP-enhanced cinema modes in addition to unenhanced decoding. Further, there are nine modes for straight music listening (“Small Hall,” “Large Hall,” “Opera House,” “Jazz Club,” “Disco/Club,” “Church,” “Live House,” “Arena,” and “Stadium”) and one for video games. You can store customized versions of any surround field, adjusting the level of the effect and the volume in each channel and, for about half the modes, varying the ersatz room’s wall reflectivity and reverberation characteristics.

And that describes only the DSP circuits’ spatial functions. They also enable you to change tone quality in a staggering number of ways, with extremely flexible bass, midrange, and treble adjustments that work in stereo as well as all surround modes. Most A/V components’ tone controls function only in stereo mode because response alterations made prior to the matrix surround (Dolby Pro Logic) processor cause decoding errors, and altering response after the processing would require tone-control circuits for all five channels. The TA-E9000ES has independent sets of tone controls for the main channels, the center channel, and the surrounds—and Sony has gone beyond the norm in providing unusually complete control facilities.

These comprise bass and treble adjustments and a midband parametric equalizer. Each bass and treble control has shelving response and ± 10 dB of adjustment in 0.5-dB steps. Each bass control’s turnover frequency can be adjusted from 99 Hz to 1 kHz in 21 steps; the treble turnover is adjustable from 1 to 10 kHz in 23 steps. In between is a parametric midrange equalizer with a choice of three bandwidths (“Wide,” “Middle,” and “Narrow”), a center frequency that can be adjusted in 37 steps from 198 Hz to 10 kHz, and a con-

trol range of ± 10 dB in 0.5-dB increments. You can store favorite settings in the five available memories. And these settings are all stored individually for each sound field. The digital processing power this must take boggles my mind!

The TA-E9000ES’s “Digital i” volume control is even more noteworthy. Combining digital and analog techniques, it adjusts signal level by changing the parameters of the preamp’s 1-bit Current Pulse D/A converters. (It does not digitally recalculate word values or adjust volume strictly in the analog domain, both of which have technical limitations.) After dejittering, eight-times oversampling, and feedforward digital filtering, digital information for each channel is converted to 1-bit pulse streams and fed to independent Current Pulse DACs. Volume is adjusted by changing the current sources that feed the converters rather than by altering word values. The level of the current source for each DAC is controlled by a static DAC that receives information from the volume control and



**THE TA-E9000ES
USES VIRTUAL SURROUND
TO SIMULATE
MORE SPEAKERS
THAN YOU REALLY HAVE.**

from such other level-adjustment functions as balance and speaker setup. Theoretically, Sony’s “Digital i” circuit should have the excellent tracking characteristics of a digital volume control with an analog control’s superior resolution at low levels.

As to speaker setup, Sony goes well beyond the usual arrangements. Once you inform the TA-E9000ES which speakers you have and whether they are “Large” or “Small,” you can set each crossover frequency in 10-Hz steps from 40 to 200 Hz, an unusually precise and flexible arrange-

ment. To adjust relative channel levels, you set left/right balance for the main and then the surround speakers, set overall level for the surround speakers, set levels for the center speaker and the subwoofer, and adjust the level of signals sent from the LFE channel to the subwoofer without affecting bass frequencies redirected to the sub from other channels. Most of these adjustments are in 0.5-dB steps, with a range from +10 to -20 dB and then to "Off" for the center speaker and the surrounds and from 0 to -20 dB for the subwoofer.

SONY'S INNOVATIVE DIGITAL i VOLUME CONTROL COMBINES DIGITAL AND ANALOG TECHNIQUES.

Delays are adjusted in terms of speaker-to-viewer distances, in feet (3 to 40, in 1-foot steps) or in meters (1 to 12, in 0.1-meter steps). You cannot select different delays for the left and right speakers of either the front or the surround pair; Sony assumes that you've placed the left and right speakers symmetrical to the primary viewing/listening position. Although this is not uncommon, it might be confining for those whose home theaters are in irregularly shaped rooms. What is uncommon is that you can set the subwoofer's delay with respect to the other speakers, for a more coherent sound; you can also reverse the subwoofer's polarity, which is nice.

Even more unusual, and perhaps unique, the TA-E9000ES has settings for your surround speakers' placement ("Side," "Middle," or "Behind" you) and height ("Low" or "High"). These settings affect only the virtual surround modes; in other modes, the 9000 assumes that your surround speakers are "low" and "behind" you, regardless of the settings.

The supplied remote is sexy and of sufficient complexity to come with its own instruction manual. Further, it is bidirectional, sending commands to the preamp and receiving information from it. During setup, its LCD touchscreen must be taught to associate each menu's displayed legends with the screen's underlying touchpoints,

which you do with a plastic pointer cleverly hidden in a slot on the remote. After that, you make selections by touching legends with a finger or, if your fingers are too large, with the pointer. You also can scroll through some menu sections with a dial at the upper right of the remote, pressing the dial to enter your command. Actual buttons are provided for muting, volume level, on/off, the sleep mode, and turning on the remote's backlight. A side roller adjusts screen contrast. Along the left of the screen are legends ("Function," "Soundfield," "List," "Sub," "Set Up," and "Reload") to call up first-level menus and download parameter settings stored in the preamp's memories. The ability to download information from the preamp comes in handy if you accidentally erase some of the remote's settings or lose them because its batteries have died. It also enables the remote to work with any software upgrades that may someday be loaded via the preamp's RS-232 port.

Using the remote is fairly straightforward. Pressing "Function" brings up a screen full of icons representing program sources. Touching one of them selects that source and then brings up a screen of operating controls for it. With another screen, you choose sound fields and adjust them. "Setup," naturally, calls up the setup menus.

The TA-E9000ES can be operated quite well from its front panel. The controls there are intuitive, and their functions are explained reasonably well in the owner's manual. I'm impressed with the clarity of the front panel's display and the fact that some buttons illuminate to indicate basic settings—for example, when the equalizer is active or when you're in stereo mode. With such a well-designed panel, I sure don't miss on-screen menus. I'm also impressed with the extras that Sony has included, such as the "Audio Split" button, which

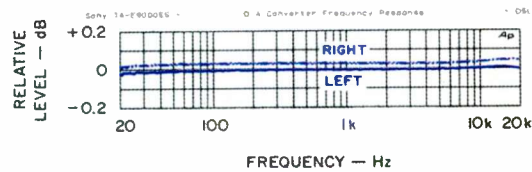


Fig. 9—Frequency response, DAC section.

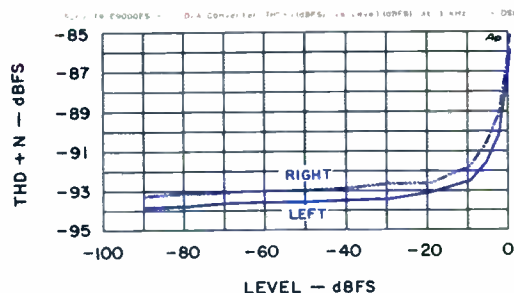


Fig. 10—THD + N vs. level, DAC section.

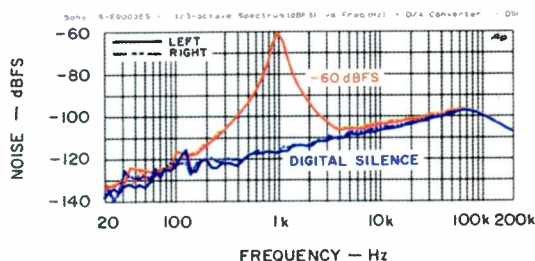


Fig. 11—Noise analysis, DAC section.

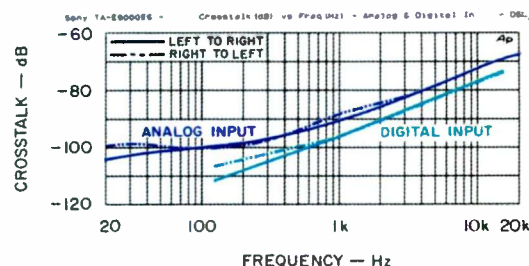


Fig. 12—Crosstalk, stereo mode.

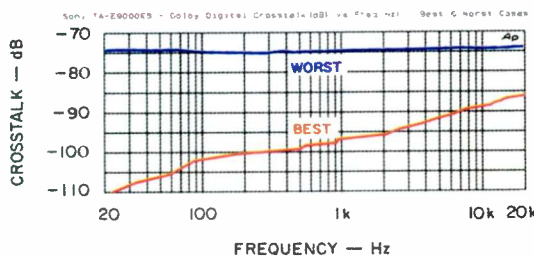


Fig. 13—Crosstalk, Dolby Digital mode.

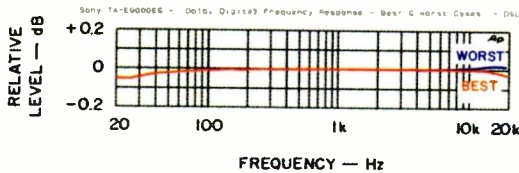


Fig. 14—Frequency response, Dolby Digital mode.

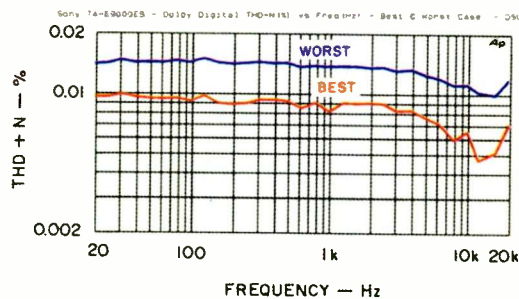


Fig. 15—THD + N vs. frequency, Dolby Digital mode.

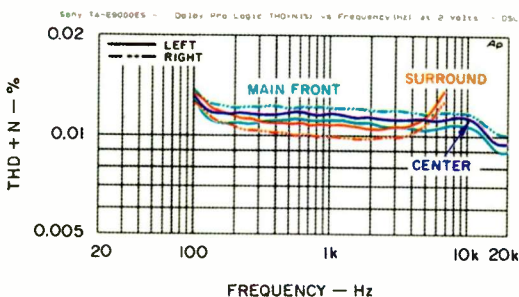


Fig. 16—THD + N vs. frequency, Dolby Pro Logic mode.

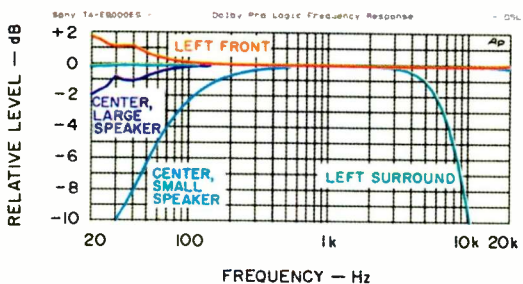


Fig. 17—Frequency response, Dolby Pro Logic mode.

lets you play any audio source in combination with a selected video program. This preamp is not only a digital wonder, it's also very well conceived!

Measurements

I tested two samples of the Sony TA-E9000ES. The first seemed to be working reasonably well until I checked its D/A con-

verter's linearity, one of my last bench tests. Everything was fine from 0 to -80 dBFS, but the output cut out at -90 dBFS. I'd never encountered this before, and I repeated the test several times to be sure I wasn't making a mistake. Even odder, the 9000 didn't cut out at -90 dBFS when it was fed analog signals and digitized them internally. Only when fed a digital bit stream, dithered or undithered, did it become confused.

When the second sample arrived, I began with the linearity test and found no problem at all. In fact, the converters in the second sample were among the most linear I've ever measured! I started the full test series over again, but it soon became apparent that there was little difference between the samples when I used analog signals, save for slightly lower distortion on the second. Therefore, I decided to use the first sample's results for tone-control response, bass-management response, input and output impedance, and record output levels. All other results are from the second sample.

Figure 1 shows frequency response of the TA-E9000ES via its analog line input and the phono input's RIAA equalization error (which amounts to the same thing as frequency response); the anti-aliasing filters ahead of the A/D converters limit treble response to 23 kHz. Note how flat the response is! Even with this very sensitive level filter ripple in the curve taken at the line input (which includes the effects of the anti-aliasing filter before the input A/D converter and the reconstruction filter after the output D/A converter). Phono equalization is notably accurate from 20 Hz to 20 kHz, too. There's a 0.2-dB mismatch in output level between the channels; the mismatch was the same at the line and phono inputs and wasn't present when I used a digital input, so I expect it's caused by a mismatch in A/D converter gain. No big deal, but there's no way to correct it.

Noise was quite good for line or phono signals, as demonstrated by the A-weighted noise results listed in "Measured Data" and the third-octave noise spectra in Fig. 2. Note the absence of power-line-related hum and how benign the noise is; it's practically "white," i.e., its energy rises at 3 dB/octave (10 dB/decade). Of course, the RIAA equalizer modifies the noise characteristic of the phono preamp, but it's still remarkably benign in the TA-E9000ES.

Except for the slight yet needless channel imbalance, I'm impressed with the Sony's line preamp. Not only was its input impedance higher than typical (without affecting noise), but there was also an adequate safety margin before A/D converter overload. The 3.1-volt figure listed in "Measured Data" was obtained using the IHF/EIA standard gain setting.

Like many digital preamps, the TA-E9000ES has switchable gain. But the Sony's "Output Low" setting, which reduced gain by 15 dB, didn't affect input overload. That's rather odd. Although digital preamps often let you select gain, they

**THE DIGITAL
PROCESSING POWER
IN THE SONY'S
TONE CONTROLS ALONE
BOGGLES MY MIND.**

change it at their input stages, to accommodate "hot" analog signals that might overload their A/D converters. The 9000 changes gain in the output amplifier instead. This is why, if I were to criticize the 9000's phono preamp, it would be for relatively (but not remarkably) low gain and a marginally low input overload point. Phono input impedance, however, is near ideal.

The TA-E9000ES can deliver more output—9.4 volts—than any power amp will know what to do with. And the 9000 can deliver it over the full audio frequency range, as seen in Fig. 3, my plot of total harmonic distortion plus noise (THD + N) versus output. At a more realistic operating level, like 2 volts (and even that's more than you usually need), THD + N is less than 0.016% over the full audio band. This can

MEASURED DATA

STEREO MODE

Output at Clipping (1% THD at 1 kHz): 9.39 V.

Maximum Voltage Gain: 14.4 dB.

THD + N at 2 V Output, 20 Hz to 20 kHz: With 80-kHz measurement bandwidth, less than 0.0255%; with 22-kHz bandwidth, less than 0.0159%.

Output Impedance: 200 ohms.

Frequency Response, Tone Controls at "0": 20 Hz to 20 kHz, +0, -0.19 dB; -3 dB below 10 Hz and at 23.15 kHz.

Tone-Control Range: Bass, ± 9.7 dB at 100 Hz; midrange, ± 10 dB at 1 kHz; treble, ± 9.8 dB at 10 kHz.

Subwoofer Crossover Points: High-pass, -3 dB at 40, 80, 150, or 200 Hz and -6 dB at 24, 47, 88, or 118 Hz; low-pass, -3 dB at 40, 80, 150, or 200 Hz and -6 dB at 52, 105, 200, or 260 Hz.

Nominal Crossover Slope: High-pass, 6 dB/octave; low-pass, 12 dB/octave.

RIAA Equalization Error, 20 Hz to 20 kHz: +0.28, -0.72 dB.

Sensitivity for 0.5 V Output: Line input, 95.4 mV; MM phono input, 1.82 mV.

Muting: Total.

A-Weighted Noise: Line input, -86.4 dBV; MM phono input, -79.8 dBV.

Input Impedance: Line input, 100 kilohms; MM phono input, 49.7 kilohms plus 180 pF.

Input Overload (1% THD at 1 kHz): Line input, 3.1 V; MM phono input, 59.9 mV.

Channel Separation: Greater than 72.7 dB, 100 Hz to 10 kHz.

Channel Balance: ± 0.11 dB.

Recording Output Level: Line input, 490 mV for 0.5 V out; MM phono input, 255 mV for 5 mV out at 1 kHz.

Recording Output Impedance: 1.03 kilohms.

D/A CONVERTER SECTION

Frequency Response: 20 Hz to 20 kHz, ± 0.02 dB.

THD + N at 0 dBFS, 20 Hz to 20 kHz: Less than 0.0058%.

THD + N at 1 kHz: Below -85.1 dBFS from 0 to -90 dBFS and below -92.6 dBFS from -30 to -90 dBFS.

Maximum Linearity Error: Undithered signal, 0.95 dB from 0 to -90 dBFS; dithered signal, 0.4 dB from -70 to -100 dBFS.

S/N: A-weighted, 96.3 dB; CCIR-weighted, 87.1 dB.

Quantization Noise: -86.8 dBFS.

Dynamic Range: Unweighted, 92.2 dB; A-weighted, 94.8 dB; CCIR-weighted, 85.2 dB.

Channel Separation: Greater than 73.3 dB, 125 Hz to 16 kHz.

DOLBY DIGITAL (AC-3) MODE

Channel Balance: +0.06, -0.04 dB.

Frequency Response: Main, center, and surround channels, 21 Hz to 20 kHz, +0.03, -0.08 dB; low-frequency effects channel, 20 to 120 Hz, +0, -0.62 dB.

THD + N for 0-dBFS Signal: Main, center, and surround channels, 0.0073% or less at 1 kHz; LFE channel, 0.0041% at 30 Hz.

THD + N at -10 dBFS, 20 Hz to 20 kHz: Main, center, and surround channels, 0.0153% or less.

Channel Separation: 73.2 dB or greater, 100 Hz to 10 kHz.

DOLBY PRO LOGIC MODE

Output at Clipping: 9.38 V or higher for main, center, and surround channels at 1 kHz.

THD + N at 2 V Output: Main and center channels, less than 0.0141%, 100 Hz to 20 kHz; surround channels, less than 0.0139%, 100 Hz to 7 kHz.

Frequency Response: Main channels, 100 Hz to 20 kHz, +0.16, -0.02 dB (-3 dB below 10 Hz and at 23.3 kHz); center channel, "Large" speaker setting, 100 Hz to 20 kHz, +0, -0.12 dB (-3 dB below 10 Hz and at 23.08 kHz); center channel, "Small" speaker setting, 84 Hz to 23.08 kHz, +0, -3 dB; surround channels, below 10 Hz to 7 kHz, +0, -3 dB.

A-Weighted Noise: Main channels, -85.8 dBV; center channel, -89.7 dBV; surround channels, -86.7 dBV.

Channel Separation at 1 kHz: 46.5 dB or greater.

be seen in Fig. 4, which also reveals that, as you'd expect, THD + N is higher with analog input than with digital. And it's higher when measured via the analog input and the 80-kHz analysis filter I normally use when testing analog preamps than via the 22-kHz filter I typically use with digital audio devices to remove ultrasonic noise related to sampling and reconstruction. When dealing with a preamp that digitizes analog signals, the latter approach is also appropriate, so I'd give more credence to the 22-kHz results in Fig. 4 and "Measured Data."

Figure 5 offers a glimpse of what you can do with the Sony's tone controls. For the bass and treble controls (Fig. 5A), I used maximum boost and cut at the maximum and minimum turnover frequencies and at a middle setting. (Those points are, respectively, 1 kHz, 99 Hz, and 250 Hz for the bass and 10, 1, and 2.5 kHz for the treble.) As you can see, each of these controls has an adjustment range of almost ± 10 dB and a shelving response characteristic. The mid-range "parametric" equalizer's performance is even more remarkable (Fig. 5B). These plots were made using the equalizer's three bandwidth settings ("Wide," "Middle," and "Narrow"), maximum and minimum boost and cut, and three center frequencies (10 kHz, 200 Hz, and 1 kHz). The equalizer's settings for center frequency are right on the money, as is its adjustment range (± 10 dB). And remember, these are just a sampling of the frequency and level settings you can choose—independently in the main front, center, and surround channels! Wow!

Figure 6 shows four of the TA-E9000ES's many crossover characteristics. I've included curves for the minimum (40-Hz) and maximum (200-Hz) crossover frequencies and two in between—80 Hz, the crossover point most often used in home theater setups and the Sony's default setting, and 150 Hz. The low- and high-pass curves are 3 dB down at the designated frequencies, but the slopes (6 dB/octave on the high-pass and 12 dB/octave on the low-pass) are only half as steep as those in many other products and as required by Lucasfilm for Home THX components. I hasten to add that the 9000 does fulfill Dolby Labs' requirements in this respect and redirects bass perfectly, in correspondence with the choices made for speaker size. Dolby Labs permits bass-man-

agement schemes of varying complexity, depending on the “level” of the product. The 9000 shoots for the highest level and attains it, though I still would have preferred sharper filters.

Let’s turn now to the D/A converter. As you can see in Fig. 7, the second sample I tested did not cut out on low-level digital signals. With a dithered signal, there is no linearity error at all for the left channel and the error for the right is only 0.4 dB at –100 dBFS. The fade-to-noise plot (Fig. 8) also suggests better-than-usual linearity. Frequency response (Fig. 9) is ruler-flat and free of filter ripple (even though the scale I used for relative level is 0.1 dB/division, far more sensitive than usual). And note that the channel imbalance I had found at the analog inputs is essentially absent. (The “mismatch” of ± 0.015 dB is within the limits of measurement error.)

Figure 10 shows THD + N versus level for the DACs. Any converter whose THD + N drops 6 dB below –90 dBFS is okay in my book. In Fig. 11 are third-octave spectrum analyses of the output when the DACs are fed a “silent” digital bit stream and a 1-kHz digital signal at –60 dBFS. The curves are free of power-line-related components (as were the noise spectra taken using the analog input), but there’s no evidence of the noise shaping usually seen with delta-sigma converters. (Noise shaping sharply increases noise energy at frequencies above the audio band because it shifts in-band quantization noise into that region.) On the other hand, the Sony’s noise energy rises smoothly and has white-noise characteristics to 70 kHz, then rolls off. This noise spectrum is, effectively, quite similar to the thermal noise of an analog circuit—in fact, I can’t be sure that what we’re seeing *isn’t* the thermal noise of the output amplifier rather than the quantization noise of the DAC! Perhaps because Sony used no noise shaping, the S/N results in “Measured Data,” though respectable, are below average. The results for dynamic range and quantization noise (which I consider far more important) are more typical of current DACs but certainly do not establish any new record.

Figure 12 compares the stereo crosstalk characteristics for the analog and digital in-

puts. Although channel separation is better via a digital input (as is to be expected), the difference between the analog and digital inputs is so small that it certainly will not be noticed. On the whole, channel separation is even better in Dolby Digital (AC-3) mode than in stereo, as reflected in the best and worst Dolby Digital channel pairings (Fig. 13). Crosstalk was best between the left surround and center channels, where sepa-



**WITH THREE 32-BIT DSP
CHIPS, THE TA-E9000ES
HAS THE COMPUTATIONAL
HORSEPOWER TO DO
A LOT OF PROCESSING.**

ration was greater than 88.2 dB out to 10 kHz. It was worst between the left surround and right front channels, but even here, minimum separation (73.2 dB) was about the same as it was in stereo operation.

Balance among the three front and two surround channels in Dolby Digital mode was excellent, which testifies to the accuracy of Sony’s “Digital i” volume control and level-adjusting system. The differences in the channels’ frequency responses (with “Large” speaker settings used all around) were negligible. Figure 14 contains the “best” and “worst” response curves for Dolby Digital mode; they are virtually identical, even on this extremely sensitive level scale. Sony’s filters and converters are really, really flat!

Figure 15 shows best- and worst-case THD + N versus frequency, through the Dolby Digital decoder. These curves are not directly comparable to those in Fig. 4 for the digital input because the AC-3 curves were taken at –10 dBFS rather than at 0 dBFS. (Neither the Home THX nor the Dolby Labs test DVD has a usable 0-dBFS distortion sweep.) The –10-dBFS reference signal is only about a third as strong as a 0-dBFS signal, so one would expect THD + N, expressed in percent, to increase by a factor of 3. That’s essentially what happens.

Dolby Pro Logic performance is great. THD + N, at the 2-volt output level and plotted as a function of frequency, is shown in Fig. 16. I start these curves at 100 Hz because measuring Pro Logic decoders in the bass region with steady-state sine waves is problematic. And, of course, the surround-channel curve stops at 7 kHz, the prescribed upper limit for that channel. That said, the curves for the various channels are remarkably similar. Noise and distortion remain below 0.015% throughout each channel’s operating region, which is excellent, as are all of the A-weighted noise readings in “Measured Data.”

In Fig. 17 is the TA-E9000ES’s frequency response in Dolby Pro Logic mode. All channels were measured using the “Large” speaker option, and the center channel’s response was also taken using the “Small” speaker option (formerly called “Normal” mode). You should ignore the deviations from flat response in the left front channel’s bass and in the center channel’s bass with the “Large” speaker setting; the deviations result from testing with sine waves, which (as I’ve said) is problematic. All of the 9000’s Pro Logic response curves are about as perfect as they get. Surround-channel response is limited to 7 kHz, as it should be, and the front channels continue flat all the way to 20 kHz.

Use and Listening Tests

The Sony TA-E9000ES is an extraordinarily interesting product, one that’s arguably in a class by itself. Its six A/V inputs (three with recording capability), five analog audio inputs (two with recording capability), and five digital audio inputs (one

with digital recording capability and three with optical and coaxial interfaces)—to say nothing of its video processor loop and internal AC-3 RF demodulator—mark the 9000 as one of the most versatile A/V pre-amps on the market. With S-video connectors doubling every composite-video jack, it imposes fewer constraints on video interfacing than most other products. The only thing missing is a component-video bus, but few current products are so advanced as to provide one.

The touchscreen-activated remote provides full control and is easy to use. It does seem to have a healthy appetite for batteries, and the backlighting and screen contrast could be greatly improved, but I had little difficulty operating it when I could see what I was doing. The menus are intuitive, and most of the touchpads are big enough to be operated reliably with a finger—with mine, at least. Two-way communication enables the remote's memory to be refreshed when necessary (when a program source is added or changed and control codes need to be reloaded, for example). When used with some Sony products, such as CD players that have a disc memory, the remote also can display disc and song titles.

All of this is very nice, but what really sets the TA-E9000ES apart from the crowd are its multiple 32-bit DSPs, 8-megabyte flash memory, and that cryptic RS-232C port on the back. Sony is officially silent about its plans for the port (a spokesperson stated that "Sony doesn't like to promise something before it's ready to deliver"). But I wouldn't be surprised if the first sample's loss of output on low-level digital signals were a fluke in software code, since I can't come up with a ready hardware explanation. If that proved to be the case, my sample could have been "repaired" simply by downloading a new instruction set. Way to go! No more repair facilities, just a connection via the Internet!

Whether that supposition proves correct or not, the RS-232C port raises the possibility of upgrading—even of "redesigning"—the TA-E9000ES in the future. Right now, for example, two of the 32-bit DSPs are devoted to sound-field processing while the SHARC chip handles Dolby Digital, DTS, and MPEG decoding. No offense meant, but how likely is it that MPEG decoding will be used in the United States? Even DTS

is far from a sure thing. Freeing that memory and computational power for other purposes would enable the 9000 to perform a variety of other tasks. What those might be is a matter of speculation.

Lots more horsepower (and memory-occupying instructions) are currently used to generate the TA-E9000ES's fantastically versatile tone controls. Some people may neither need nor want such versatility. To be honest, the "Narrow" setting of the parametric equalizer has such high Q that it's unusable as a normal tone control, but if you're into generating weird effects, you

**THE TA-E9000ES'S
SOFTWARE IS STORED
IN FLASH MEMORY,
SO SOFTWARE UPGRADES
ARE A POSSIBILITY.**

might like to play with it. The high-Q setting is also likely to require the most computation, so forgoing it might allow Sony to include one or more other functions that are far more valuable. (I'd be happy to trade it for sharper crossover filters.)

One could even sacrifice some of Sony's sound-field effects, although I must say that they're among the better ones I've heard—far less obvious and gross than usual. Eliminating a few of them—perhaps the layered ones—would free up huge amounts of horsepower for other purposes. Now, I'm not saying this is what will be done or even that it's what should be done; I'm simply saying that it could be done. I can envision a day when you have your Sony TA-E9000ES and I have mine, each customized to our own needs. I can envision a day when we change our minds and "redesign" our systems via the Internet. I can even envision third-party software, but that's getting pretty far out there. For this versatility, I'm willing to accept DACs that, although decent and arguably indistinguishable from the best in a home theater application, are not up to the high standards that Sony has demonstrated in the past.

In short, the TA-E9000ES is an outstanding and exceptionally flexible A/V pre-amp/processor that holds out the promise of becoming even more so in the future. A



FREE Audio Catalog

At Cambridge SoundWorks we make unique, critically-acclaimed audio and video sound and music systems designed by Henry Kloss (founder of Acoustic Research, KLH & Advent). We sell them—along with components from companies like Sony, Harman Kardon, Marantz and others—factory-direct, with no expensive middlemen. Call today and find out why *Audio* magazine said we may have "the best value in the world."

- Call toll-free - 8AM-Midnight (ET), 365 days a year—even holidays.
- Save hundreds on components and systems from Cambridge SoundWorks, Sony, Marantz, Harman Kardon, Panasonic, JVC and more.
- Audio Video consultants will answer your questions before and after you buy.
- 30-Day Total Satisfaction Guarantee on all products.

"The Best I've Heard."
Stereo Review



Model 88 by Henry Kloss combines a remarkable AM/FM tuner, advanced electronic design, component-quality amplifiers and a speaker system which includes a built-in powered subwoofer. Also includes a slim, easy-to-use remote, and two sets of stereo inputs. *Audio* calls it a "blockbuster."

Model 88 \$199⁹⁹
Introductory Price:

1-800-FOR-HIFI

**CAMBRIDGE
SOUNDWORKS**

Top Rated Audio Products...Direct From Our Factories

311 Needham Street, Suite 104, Newton, MA 02464
Tel 1-800-367-4434 Fax 617-527-3194
Canada 1-800-525-4434 Outside U.S. or Canada 617-339-5936

©1999 Cambridge SoundWorks, Inc.
Cambridge SoundWorks is a registered trademark and Model 88 by Henry Kloss is a trademark of Cambridge SoundWorks, Inc.

www.HIFI.com

9B ST



Hearing is Believing... Feel the Emotions

Bryston's 9B ST delivers extraordinary quality to your entire home theatre surround sound experience.

Feel the emotions: be shocked, be happy, feel sad, scared out of your wits, surprised, be moved, be excited, feel like you want to cry with joy. The Bryston 9B ST amplifier will awaken all of your emotions in a simple elegant package designed to provide 5 channels of uncompromised sound quality.

Tel 1-800-632-8217 Fax 705-742-0882 www.bryston.ca

BRYSTON



D. B. KEELE, JR.

JMlab COBALT 820 SPEAKER

The Cobalt 820 is the top model in JMlab's seven-speaker Cobalt series. But it's not the top speaker in the company's total line, which includes 27 speakers that range up to the Grand Utopia at \$70,000 per pair. The last loudspeaker from this French company that I reviewed, the Spectral 913.1 (*Audio*, November 1995), performed notably well.

JMlab is named for Jacques Mahul, its founder and current president. Previously chief engineer and head of R&D of another French speaker company, Audax, he founded both JMlab and Focal in 1980. Focal, which manufactures the raw drivers used by JMlab, also supplies more than 50 speaker manufacturers worldwide (including, in the United States, Avalon Acoustics, Legacy Audio, Snell Acoustics, Thiel, Westlake Audio, and Wilson Audio Specialties). JMlab/Focal is France's largest speaker maker.

The Cobalt 820 is a three-way, front-ported vented-box design. Its drivers are arrayed vertically, with two 7-inch woofers below a 1-inch inverted-dome tweeter and a 5-inch midrange on top. Just below the bottom woofer is a generously flared port tube, 2¼ inches in diameter and 2½ inches long. The 820's slim cabinet is only 8½ inches wide but, at about 40 inches, is fairly tall. The grille frame, solidly made of half-inch medium-density fiberboard (MDF), plugs into the front panel.

The cones of the 820's long-excursion woofers are made of a material that JMlab

Rated Frequency Response: 40 Hz to 23 kHz, ±3 dB.

Rated Sensitivity: 91 dB at 1 meter, 2.83 V rms applied.

Rated Impedance: 8 ohms, nominal; 3 ohms, minimum.

Rated Power Handling: 200 watts.

Dimensions: 40⅜ in. H x 8⅝ in. W x 12¼ in. D (102.5 cm x 22 cm x 31.2 cm).

Weight: 51.9 lbs. (23.6 kg) each.

Price: \$2,500 per pair; available in natural, red cherry, or black cherry wood veneers.

Company Address: c/o Audio Plus Services, P.O. Box 3047, Plattsburgh, N.Y. 12901; 800/663-9352; www.audio-plusservices.com.



calls Polyglass, a combination of cellulose and a synthetic material called Neoflex to make it strong and light, coated with hollow glass microspheres in a resin binder. (The granular coating feels like a very fine grade of sandpaper.) A rubber surround attaches the cone to a cast metal frame. The voice coil is about 1½ inches in diameter and is wound on an aluminum former; it is powered by a large ferrite magnet, ¾ inch thick and 4 inches in diameter.

This speaker's midrange driver is much like its woofers, even using an identical magnet. Its cone is variously described in the JMlab catalog as the same Polyglass found in the woofers and as Neoglass (with no explanation of the discrepancy); like the woofers, it is attached by a rubber surround. Instead of a dust cap, however, the midrange has a stationary, bullet-shaped phase plug at the center of the cone. The voice coil, 1 inch in diameter, is wound on a

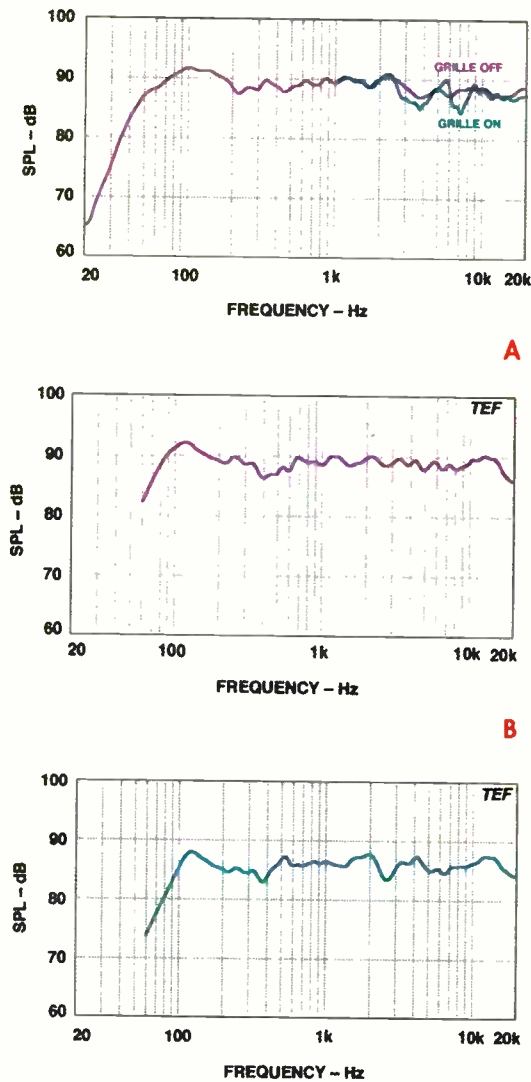


Fig. 1—On-axis frequency response of Cobalt 820 (A), Cobalt CC 20 center-channel speaker (B), and Cobalt SR 20 surround speaker (C).

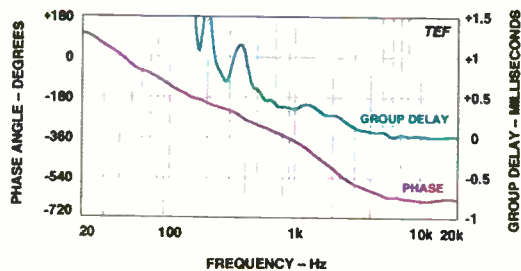


Fig. 2—On-axis phase response and group delay, Cobalt 820.

Nomex former. The back of the midrange is enclosed by a sealed plastic tube. The same diameter as the driver and filled with wadding, the tube extends to the rear of the Cobalt 820's cabinet.

also offers an optional base, whose heavy weight and large footprint greatly increase the cabinet's stability.

The 820's crossover contains 15 components that make up a second-order (12-

The tweeter, made of titanium with a thin coating of titanium dioxide (which JMLab calls Tioxid), is suspended by a large flat foam surround; the voice coil's diameter is about $\frac{3}{4}$ inch. In front of the tweeter dome, on a plastic brace, is something that JMLab variously calls a phase plug and an "acoustical impedance control device"; it is a small cone, about $\frac{3}{8}$ inch in diameter and $\frac{1}{4}$ inch deep, whose point is aimed at the diaphragm's center. The Cobalt series catalog does not say what this structure is for, but other companies use similar devices to flatten their tweeters' on-axis response and broaden response off-axis. I consider it much too small to affect the response—after all, $\frac{3}{8}$ inch is only about a quarter of a wavelength at 16 kHz!—but I'd have had to break it off to measure the tweeter's performance without it.

Because the company supplied a pair of Cobalt SR 20 surround speakers (\$700 per pair) and a Cobalt CC 20 center channel (\$600), I checked them out briefly. A similar Tioxid tweeter is used in the CC 20 and SR 20 but with a slightly larger phase plug than in the 820. In the CC 20, the tweeter is flanked by two $6\frac{1}{2}$ -inch woofers; the SR 20, a front-radiating speaker, uses the Tioxid tweeter with a $6\frac{1}{2}$ -inch woofer. Both systems have sealed enclosures.

The Cobalt 820's cabinet, of $\frac{3}{4}$ -inch MDF, is made more solid by a front-to-rear brace just above the top woofer, by a side-to-side brace behind the bottom woofer, and by the midrange's enclosure tube. JMLab provides spikes for the bottom of the cabinet, metal footer discs to protect hardwood floors from the spikes' points, and stick-on foam discs that can be used instead of the spikes. The company



The Cobalt 820's dual pairs of gold-plated binding posts are convenient for bi-wiring.

dB/octave) filter for the parallel-connected woofers, a bandpass filter (consisting of a second-order high-pass in cascade with a third-order, 18-dB/octave, low-pass) driving the midrange, and a third-order high-pass filter for the tweeter. All inductors have ferrite cores. Connections to the Cobalt 820's drivers and input terminal cup are soldered. The terminals themselves are gold-plated, five-way binding posts, arranged in dual pairs to facilitate bi-wiring but connected together with gold-plated straps for normal cabling.

Measurements

Figures 1A, 1B, and 1C show, respectively, on-axis anechoic frequency response of the JMLab Cobalt 820, Cobalt CC 20, and Cobalt SR 200. (These measurements were taken 2 meters from each cabinet front, for the 820 at a level halfway between the midrange and tweeter, and smoothed with a tenth-octave filter. All curves are based on elevated free-field measurements, combined with ground-plane measurements in the 820's case.)

Except for a low-frequency bump at 100 Hz, the Cobalt 820's response with the grille off is quite smooth and flat and fits a tight, 3.5-dB, window from 49 Hz to 20 kHz. Below 35 Hz, the response rolls off at 24 dB/octave. Above 3 kHz, the nominal crossover from the midrange to the tweeter, the response shelves off by about 2 dB. (Beyond 20 kHz, the tweeter's output underwent a series of peaks and dips, indicating the presence of several ultrasonic dome resonances; a 91.7-dB peak at 20.3 kHz was fol-

lowed by a dip to 71.8 dB at 22.9 kHz, then another peak of 93.2 dB at 25.9 kHz. Above that frequency, response dropped fast, falling to 78 dB at 30 kHz, the highest frequency I measured.) The 820's grille causes fairly significant response variations above 2.5 kHz, where maximum deviations range from +2.5 to -4 dB.

As the Cobalt CC 20 center channel and SR 20 surround speakers weren't officially part of this review, I measured only their on-axis frequency responses. The CC 20's response (Fig. 1B) is very uniform and, except for a bass rolloff that starts earlier, at 90 Hz, is a very close match for the 820's. It should make an admirable companion to a pair of 820s in a home theater, where matched timbre in the three front channels

**THE JMLab 820 SPEAKERS
REQUIRE ONLY ABOUT
A THIRD TO A QUARTER
AS MUCH POWER
AS MY USUAL SPEAKERS.**

is extremely important. The SR 20's response (Fig. 1C), though not as smooth as either the 820's or the CC 20's, still fits a fairly tight, 5-dB, window from 90 Hz to 20 kHz. Its level is about 2.5 dB lower than the other speakers', however.

To check the phasing between the Cobalt 820's woofers and midrange, I reversed the woofers' connections via the bi-wire terminals, which caused a deep reduction in output in the two octaves centered near the 400-Hz nominal crossover frequency. This demonstrates that the woofers and midrange are solidly in phase through their crossover region when these drivers are connected normally, an ideal condition that minimizes lobing and maintains proper directional characteristics at crossover. The fact that the speaker's output was reduced over a wide, two-octave, band when I reversed the connections indicates that the drivers' responses overlap significantly at crossover. This would have been a problem if the drivers were significantly out of phase when normally connected; fortunately, they were not. For the record, the Cobalt 820's sensitivity, averaged from 250 Hz to 4 kHz, was 89.4 dB.

Below 15 kHz, the right and left speakers matched closely, within ± 1 dB. At higher frequencies, one tweeter's output rose above its mate's, the difference reaching 3.5 dB at 20 kHz. The disparity in treble output is probably due to the dome resonances above 20 kHz, which are hard to control.

Figure 2 shows the 820's phase and group-delay responses, referenced to the tweeter's arrival. A direct-radiator speaker's phase curve commonly slopes down, as seen here, because its midrange's output follows its tweeter's. In the 820, the drop is smooth until about 5 kHz, in the tweeter's band, where it levels out at about -640° . By averaging the group delay between 700 Hz and 2.5 kHz, I calculated that the midrange lag was approximately 0.33 millisecond.

The 820's horizontal on- and off-axis responses are shown in Fig. 3. In the primary listening window, within $\pm 15^\circ$ of the axis, the response is extremely uniform all the way to 20 kHz. Even 35° off axis, it is essentially flat to 12.5 kHz. All curves are quite uniform.

The Cobalt 820's vertical on- and off-axis responses (Fig. 4) are also very uniform in the $\pm 15^\circ$ listening window. The symmetry between the above- and below-axis responses through the upper crossover region (3 kHz) indicate ideal phasing between the midrange and tweeter. Comparing Figs. 3 and 4, we see that the high-frequency response above 6 kHz is as uniform and even above and below axis as it is to either side.

The Cobalt 820's impedance (Fig. 5A) varies widely, from lows of 2.9 ohms at 125 Hz and 2.6 ohms at 2.1 kHz up to 14.7 ohms at 58 Hz and 15.7 ohms at about 18 Hz. The dip at 35 Hz shows the approximate point of the vented enclosure's tuning frequency. Based on these impedance extremes, keeping cable series resistance to no more than about 0.037 ohm should ensure that peaks and dips caused by cable effects will be no larger

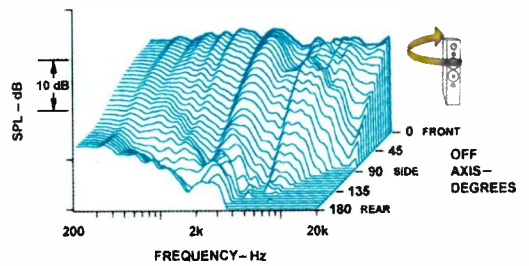


Fig. 3—Horizontal off-axis frequency responses.

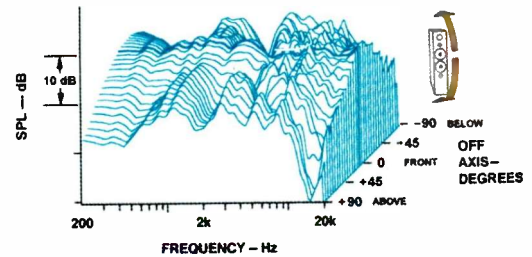
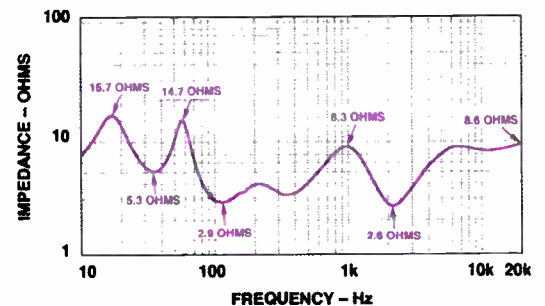
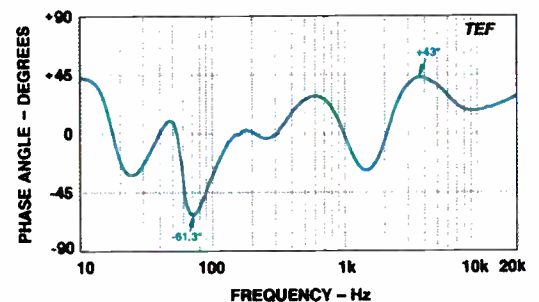


Fig. 4—Vertical off-axis frequency responses.



A



B

Fig. 5—Impedance magnitude (A) and phase (B).

than 0.1 dB; for a run of 10 feet, this corresponds to 12-gauge (or heavier), low-inductance cable.

The 820's impedance phase (Fig. 5B) varies from -61.3° at 70 Hz to $+43^\circ$ at 3.6

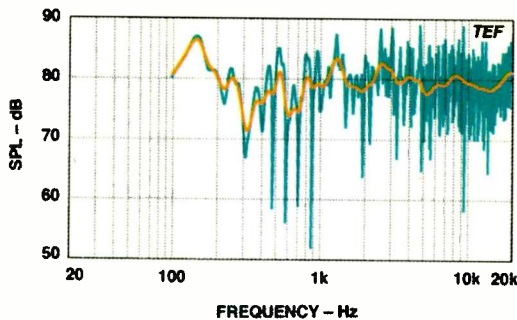


Fig. 6—Three-meter room response.

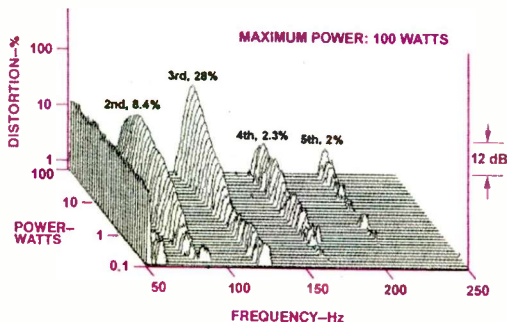


Fig. 7—Harmonic distortion for E_1 (41.2 Hz).

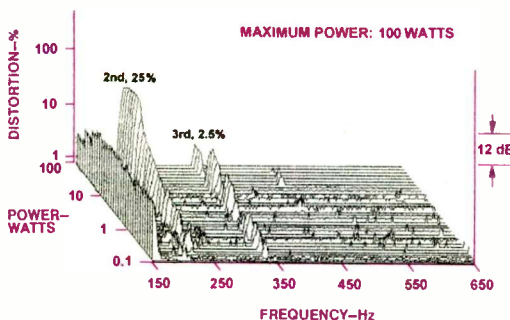


Fig. 8—Harmonic distortion for A_2 (110 Hz).

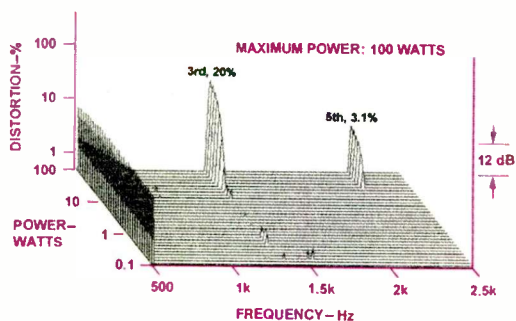


Fig. 9—Harmonic distortion for A_4 (440 Hz).

kHz, near the upper crossover. These phase extremes, coupled with the 820's low impedance minimums, indicate that the JMLab will be a fairly difficult load for most amps and that it should not be driven in parallel with other speaker systems.

Driving the Cobalt 820 with a high-level sine-wave sweep caused very little wall vibration (though there was some minor vibration of the top and sides at 400 Hz), a sign that the cabinet is quite rigid. The woofers had a healthy maximum excursion of about $\frac{3}{4}$ inch, peak to peak, and overloaded quite gracefully. (There was, however, significant dynamic offset with sine-wave signals of more than 10 volts rms between 70 and 110 Hz.) The woofers' excursion reached its minimum at 39 Hz, close to the 820's vented-box resonance. The vent did its job quite well, reducing cone excursion at this frequency by a significant two-thirds, which I measured by closing the vent temporarily to check the speaker's performance without it.

For Fig. 6, raw and smoothed 3-meter room response, I placed the 820 in the right-hand stereo position and aimed it at the test microphone, which was at ear height (36 inches) at the listening position. Above 200 Hz, the smoothed curve fits a fairly tight window of 12 dB; above 800 Hz, it fits a much tighter, 6-dB, window.

I analyzed the Cobalt 820's harmonic distortion at 41.2 Hz (E_1), 110 Hz (A_2), and 440 Hz (A_4) for input power levels up to 100 watts (28.3 volts rms into the rated 8-ohm load). At 41.2 Hz (Fig. 7), the second harmonic is highest (about 13%) at 20 watts and relatively low (8.4%) at full power. The third harmonic rises to a significant 28% at full power, although the JMLab speaker still sounded clean at this level, producing a loud 104 dB SPL at the 41.2-Hz test frequency. The fourth and fifth harmonics are both less than 2.5%.

With a 110-Hz signal (Fig. 8), the second harmonic again reaches its maximum, a significant 25%, at 20 watts but rises no farther. This is because the woofers exhibit significant dynamic offset at the 110-Hz fundamental with inputs of 20 watts or more. This offset, an outward cone displacement, rounds off one side of the acoustical waveform coming from the cone, and the resultant asymmetry raises the level of the second harmonic. The third harmonic has an intermediate peak (about 3.5%, this time at about 12.5, not 20, watts) and then drops and rises again (to 2.5% at full power).

At 440 Hz (Fig. 9), the third is by far the dominant harmonic. Again, distortion jumps at about 20 watts, staying below my analyzer's measurement floor at lower power levels before the third and fifth harmonics pop up out of the background. Although the Cobalt 820 sounded quite harsh when reproducing the 440-Hz tone at 100 watts, the culprit this time was saturation of the

**SYMPHONIC MUSIC
BENEFITED
FROM THE COBALT 820s'
SMOOTH AND WIDE
DISPERSION.**

3.5-millihenry iron-core inductor in the woofer crossover, not dynamic offset. Saturation causes symmetrical distortion, increasing the odd, rather than the even, harmonics.

When the 820 is fed an equal mixture of 440-Hz (A_4) and 41.2-Hz (E_1) tones at power levels from 0.1 to 100 watts, its intermodulation distortion rises smoothly to a quite audible 9.1% at 100 watts (Fig. 10). Both the woofers and the midrange radiated significant amounts of the higher, 440-Hz, tone during this test, probably because all of these drivers are active at frequencies this close to their crossover.

Figure 11 shows the short-term, peak-power input and output of the Cobalt 820, measured using a 6.5-cycle shaped tone burst. As the 820's nominal impedance is 8 ohms, power levels were calculated by assuming that the measured peak voltages were applied across an 8-ohm resistor. At 20 Hz, the maximum input power is only

10 watts. It rises rapidly to a peak of 300 watts at 50 Hz, dips to 110 watts at 350 Hz, rebounds to 1,480 watts at 1.5 kHz, falls again to 860 watts at 2.6 kHz, and finally rises to 3,600 watts above 6 kHz. The first part of the dip between 80 and 700 Hz is caused by the woofers' dynamic offset, which limits the 820's acoustic output. The rest of this dip, and the dip between 2 and 4 kHz, are caused by saturation in the speaker's crossovers. When I bypassed the lower crossover and fed my amp directly to the woofers, the permissible input power rose significantly, as illustrated. At 400 and 500 Hz, the input power rose from 120 watts up to 900 watts, a very significant 9 dB!

With room gain, the Cobalt 820's peak acoustic output is weak (84 dB) at 20 Hz but then rises rapidly to a plateau of about 117 dB between 55 and 90 Hz. After falling significantly, to 110 dB at 400 Hz, the maximum output rises again, staying at about 120 dB from about 1 to 3.2 kHz and then rising to a loud 124 dB above 5.5 kHz.

Use and Listening Tests

The JMLab Cobalt 820s weigh 52 pounds each, which made them very easy to unpack and position. One speaker of the pair sustained some shipping damage, arriving with a corner of the cabinet bashed in, but it worked just fine. The Cobalt 820s were supplied in natural cherry, the CC 20 center speaker in a darker red cherry, and the SR 20 surround speakers in redburn lacquer (a

SOUNDS REMAINED IMPRESSIVELY CONSISTENT WHEN PANNED BETWEEN THE MAIN AND CENTER SPEAKERS.

finish available only on the center and surround speakers). All three finishes were very attractive, but I liked the red cherry best. The front panels of the 820s and the CC 20 were finished in semigloss black lacquer and looked quite good even with the grilles off (which was how I did most of my listening). All surfaces of the surrounds were finished in redburn and were quite good-looking. The cabinetry and workmanship on all three models were first-rate.

The JMLab speakers have separate manuals for stereo listening and home theater. Both manuals describe the company's entire line, not just the Cobalt series. The stereo listening manual covers just about every area of setup and operation, including room acoustics, placement, accessories, cabling, and amplifiers. The equally detailed home theater manual covers subwoofers, surrounds, and center-channel speakers extensively.

I did most of my listening to the Cobalt 820s in my regular stereo setup. I positioned them as I do most speakers, about 2 feet from the side walls and 3 feet from the wall behind them. I canted them in toward me and used single wiring (facilitated by the 820's very accessible rear terminals). My other equipment included a Krell KRC preamp, a Crown Macro Reference power amp, an Onkyo CD player, Straight Wire cabling, and, as in most of my previous reviews, B&W 801 Matrix Series 3s for comparison.

On The Dixie Chicks' smash country CD *Wide Open Spaces* (Monument 68195), the Cobalt 820s performed commendably, with overall balance and tonality quite close to the B&Ws'. Vocals were clean and clear at moderate to loud levels, although the JMLab speakers slightly emphasized sibilants and were brighter than the B&Ws. Despite that brightness, the 820's treble characteristics were well balanced with its low end. Vocals did sound slightly strained at very loud concert levels, but I rarely use such levels for normal listening. The JMLabs' bass kick nearly equaled the B&Ws'.

The Cobalt 820 speakers were more sensitive than the 801s, so I attenuated their input signal by about 4 to 5 dB to match levels. In other words, the B&W speakers require two-and-a-half to three times more amplifier power than the JMLabs, a significant difference.

The Cobalt 820s could be played loud and cleanly on rock, pop, and jazz that did not have much content below 40 Hz. On pipe organ and other music that did have high energy below 40 Hz, they came out second best to the B&Ws (most speakers

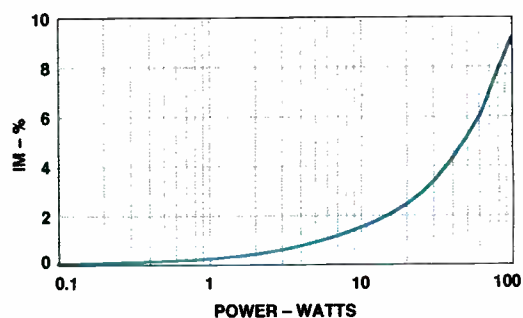


Fig. 10—IM distortion for A₄ (440 Hz) and E₁ (41.2 Hz).

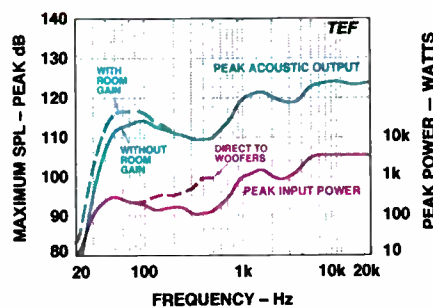


Fig. 11—Maximum peak input power and sound output.

do). But even with organ music, the 820s' low-frequency overload was minimal and their sound was still fairly clean at high levels. Though these JMLab speakers did not deliver the very lowest wall-shaking bass notes, they still made a good account of themselves.

Symphonic music profited greatly from the 820's smooth and wide dispersion. Imaging and center-channel stability were outstanding. The 820s were also very well suited to re-creating chamber music, including its small-room ambience. In fact, they performed quite well on most everything I played.

After my initial round of listening tests and measurements, I set up an additional listening session to see if I could hear the effects of crossover inductor saturation on music, closely comparing the JMLabs' sound to the B&Ws' at high volume levels. On normal wideband music recordings, both speakers sounded equally clean, and I really couldn't hear much difference between them until I raised the volume to extreme concert levels. When played super



Cobalt CC 20 center-channel speaker (left) and Cobalt SR 20 surround speaker (bottom).



loud, the 820s did tend to sound slightly strident, but not nearly so much as I would have predicted from the measurements. This is because the crossover inductors saturate only when most of the signal's energy

is concentrated in the crossover bands, not when it is spread across the spectrum, as it usually is in music. Therefore, music sounds clean through the Cobalt 820s even when played loud. The stridency was, however, easy to hear on narrow-band transient signals, such as tone bursts and band-limited noise, and was especially audible on sine waves (though only when the sound was already very loud).

The JMLab Cobalt 820s passed both my pink-noise tests with flying colors. On the stand-up/sit-down test, I heard hardly any change in the upper midrange when I stood up. Pink-noise response was also quite good: There was some high-frequency emphasis, although the tonal differences from band to band were less than on the pair of B&W 801s.

On third-octave band-limited noise, the Cobalt 820s produced no usable output below the 32-Hz band yet had quite good output at 40 Hz, though I could detect significant port noise in those bands. At 63 Hz and above, the JMLab 820s mostly equaled the B&W 801s' performance except for the noticeable dynamic offset in the bands from 80 through 125 Hz and the sudden harshness at very high levels in the bands from 250 to 400 Hz, which was caused by inductor saturation.

When I moved the JMLab speakers to my home theater, they did not let me down. I was impressed by the way sounds retained their tonal character when panned between the 820s and the CC 20 center speaker. The SR 20 surrounds performed up to my high expectations and beyond. And the sensitivity of all three models helped them reproduce loud special effects well.

The JMLab Cobalt 820, Cobalt CC 20, and Cobalt SR 20 proved to be excellent all-around performers. They are good looking, well built, and—compared to other high-end speakers—reasonably priced. Go out and hear them for yourself. **A**

MERCURY

S E R I E S

This is not a Quiet Revolution

This is a heart thumping, ear crunching, blood racing, spine tingling, hair raising, ground shaking kind of revolution!

The excitement of a true home theater experience at an affordable pricepoint is not easy to come by. Tannoy has transcended the norm by providing a truly realistic sound sensation in an attractive, contemporary cabinet design. How do we accomplish this? Unlike many of today's inferior highly resonant plastic enclosures, large Mercury enclosures are constructed from medium-density fiberboard for its inert, low-coloration characteristics. Tannoy employs only the highest quality bass and treble units; in fact, all of the internal components for the Mercury Series were chosen for their performance parameters first. The crossover is knit with precision components, delivering balanced and seamless audio quality. This is the sort of performance one expects from a senior loudspeaker manufacturer with more than 70 years experience as the worldwide leader in professional studio, post, film and broadcast monitoring worldwide.

The Mercury Series provides rich, powerful bass, dynamic, clear and accurate sound quality, ensuring Mercury provides not merely hype, but good, old-fashioned value. Mercury is at home in any application, providing the dynamic delivery of home theater presentations as well as punchy and accurate stereo playback. It's a demanding world out there, so choose the line of loudspeakers that are as versatile as your requirements are demanding.

TANNOY

Tannoy/TGI North America
 300 Gage Avenue, Unit 1
 Kitchener, Ontario, Canada N2M 2C8
 519 745 1158 • Fax: 519 745 2364
 Web site: <http://www.tannoy.com>



Defining Dolby Digital.[®]

The new GTP-740 Surround Sound Tuner/Preamp.

ADCOM
DIGITAL

GTP-740

Dolby Digital
Cinema
Dolby Pro Logic
symphony hall
stadium
jazz club
5-chan. stereo
2-chan. stereo



full
75%
50%
25%

surround mode

dialog enhance

dynamic range

CINEMA

1 2 3 4
FM/AM seek/manual

ADCOM[®]

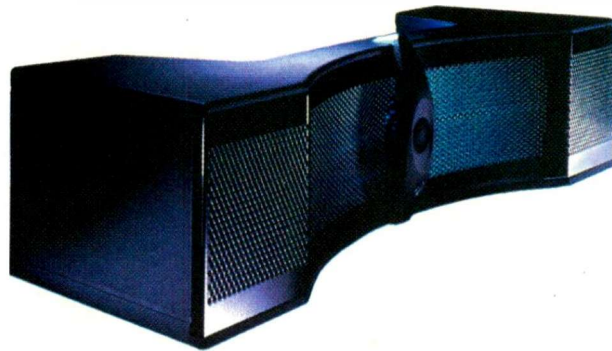
Designed for your ears.
And what's between them.

10 Timber Lane • Marlboro, NJ 07746 • Tel: 732.683.2356 • Fax: 732.683.2358

Web: <http://www.adcom.com> © 1998 ADCOM

DOLBY Digital is a trademark of Dolby Laboratories Licensing Corp.

REVOLUTION HOME THEATER
Ultimate precision



Experience a formidable ensemble of our exclusive CLS (curvilinear electrostatic) technology. The **Cinema** center channel combined with the **Aerius i** (front) and **Script** wall-mount (rear) render music and video with razor sharp imaging and clarity unmatched by anything in their class. Matching steel mounting brackets (**Script**) and stands (**Cinema**) reward you with endless flexibility in placement and resonate with proper ergonomic design. Let the performance begin.

Available at fine audio retailers world wide.

e l e c t r o s t a t i c


MARTIN LOGAN

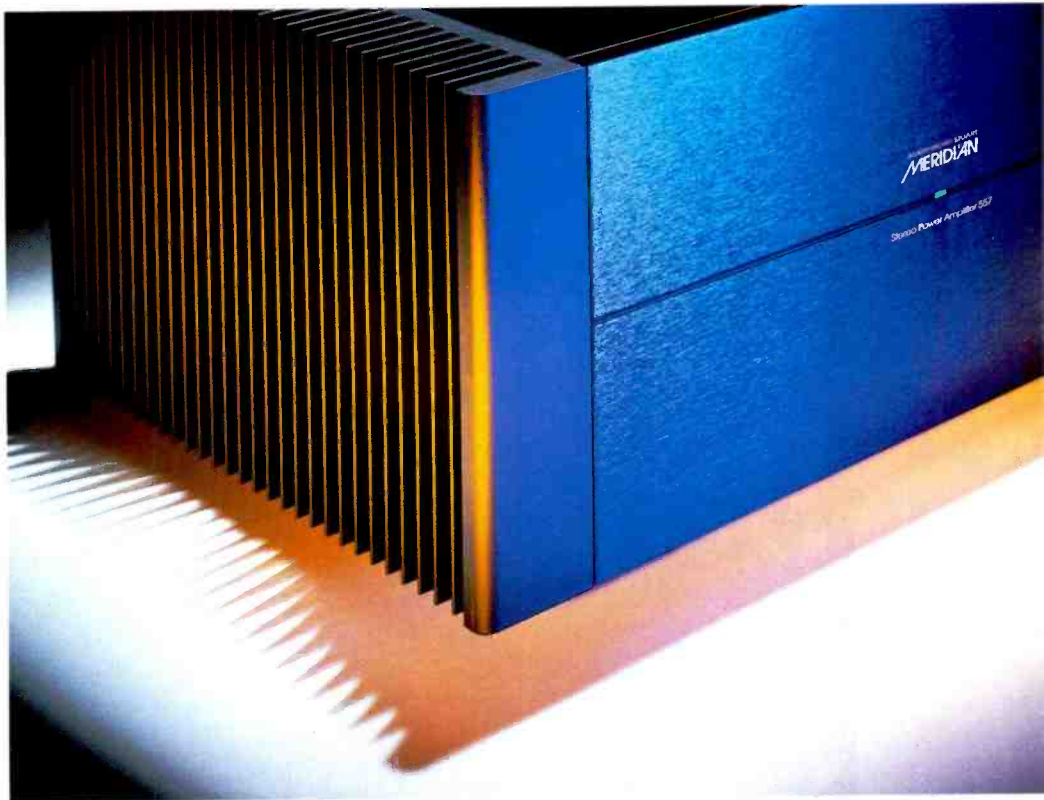
www.martinlogan.com
tel. 785.749.0133 fax: 785.749.5320

MERIDIAN 557 AMPLIFIER

The Meridian 557 is a strictly analog component from a company best known for advanced digital technology. Founded some 20 years ago as Boothroyd/Stuart, Meridian owes much of its fame to its introduction of the first "high-end" CD player, improving upon a technology promoted as already "perfect." Since then, the company has produced a singular line of DSP-enhanced active loudspeakers and the Meridian Lossless Packing system, which was recently adopted for data "squeezing" in the new DVD-Audio standard.

The 557 power amplifier exemplifies other aspects of Meridian-think: It is thoroughly engineered, employs some fresh circuit ideas, and is beautifully constructed and finished. You can't say the 557 is inexpensive, but it is fairly priced by esoteric audio standards. This particular power amp, a third-generation model (though it isn't designated "Mk. III"), embodies many circuit changes that set it apart from its identically named predecessors.

The Meridian 557's front panel bears only a single, green power LED. Besides balanced XLR and unbalanced RCA inputs, the rear panel carries two paralleled pairs of output binding posts per channel to facilitate bi-wiring. The posts are U.S.-friendly, with holes and 3/4-inch spacing to accept single or dual banana plugs; they are also of unusually nice, all-metal construction with fully removable nuts and large-diameter wiring holes. A power switch, an IEC AC socket with integral line fuse, and a screw-driver-activated bridging switch are also on



the rear panel. There is no DC-trigger terminal for auto on/off switching; Meridian recommends leaving the 557 switched on unless it's not being used for an extended period. (Idle consumption is specified as 30 volt-amperes.)

Physically, the 557 is fairly imposing: It's a nearly 60-pound rectangular solid of quite high-quality metalwork that includes handsome heat-sink castings as well as heavy-gauge sheet-steel rear and bottom panels. The front panel looks to be a solid half-inch aluminum billet (it's actually an extrusion about 1/8 inch thick overall, with solidity-enhancing ribs and anti-resonant padding along its open inner

surfaces), while the top is the black-glass plate (which shows fingerprints with relentless clarity) that's become a signature of Meridian's components.

Under the hood, the 557's arrangement appears quite traditional. Each channel is served by a separate board, nestled against the heat sink, that contains the input, volt-

age-gain, and output circuitry; all but the output stages appear to be discrete-transistor/IC hybrids. Both boards are supplied by separate three-lead windings from a massive toroidal transformer; each

board carries 20,000 microfarads of storage capacitance. Each channel employs four bipolar pairs of Motorola NPN and PNP

**MERIDIAN'S 557
DELIVERED THE NUANCE
AND TRANSPARENCY
I EXPECT FROM
A TOP-FLIGHT AMP.**

Rated Output: More than 200 watts per channel into 8 ohms or 300 watts per channel into 4 ohms; bridged, more than 390 watts into 16 ohms, 650 watts into 8 ohms, or 950 watts into 4 ohms.

Rated Distortion: Less than 0.05%, 20 Hz to 20 kHz.

Dimensions: 15 3/4 in. W x 7 in. H x 12 5/8 in. D (40 cm x 17.6 cm x 32 cm).

Weight: 59.4 lbs. (27 kg).

Price: \$2,395.

Company Address: 3800 Camp Creek Pkwy., Bldg. 2400, Suite 122, Atlanta, Ga. 30331; 404/ 344-7111; www.meridian-audio.com.

Excuse us for being... Simply Spectacular



We're Mirage®. We're known for our Bipolar and Omnipolar® speaker designs that revolutionized the high-end speaker industry. Now, Mirage® introduces the FRx-Series, once again establishing a new standard in performance and styling in the affordable speaker arena. See it. Hear it. At your Mirage® dealer today.

The New FRx-Series...

**SIMPLY SPECTACULAR
IN PERFORMANCE.**

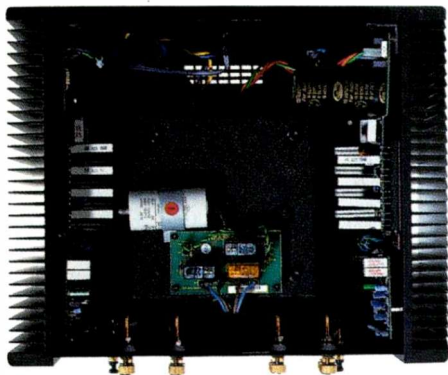
**SIMPLY ELEGANT
IN STYLING.**

**SIMPLY AFFORDABLE
IN PRICE.**

Mirage®

SEE THE MUSIC!

AUDITION THE FRx-SERIES AT THE AUTHORIZED MIRAGE DEALER IN YOUR AREA OR LOOK US UP ON THE WEB: www.miragespeakers.com
A DIVISION OF AUDIO PRODUCTS INTERNATIONAL CORP., 3641 MCNICOLL AVENUE, SCARBOROUGH, ONTARIO, CANADA M1X 1G5
TELEPHONE (416)321-1800 FAX (416)321-1500



THE 557 LOOKS FAIRLY IMPOSING, A 60-POUND RECTANGULAR SOLID OF HIGH-QUALITY METALWORK.

output transistors, nominally rated to deliver 100 audio-frequency watts per pair with a very generous safe-operating area (1 amp at 100 volts for 1 second). The 557's internal metalwork looks about as meticulous as the external hardware, and the wiring is top-grade—professionally soldered and using premium cables (such as the heavy van den Hul links that feed the speaker outputs). First-class p.c. boards with plated-through holes are employed. Parts quality appears high throughout the amp, as does construction detail.

Meridian says the third-generation 557 has a “super-balanced” input stage (which even balances signals at the unbalanced jacks) that has near-perfect impedance symmetry. The amp's physical layout and lead dress were carefully laid out in mirror symmetry to preserve full audio quality in bridged mode.

The output stages use a variation of the “error-corrected” topology proposed in 1984 by noted British audio thinker and pedagogue Malcolm Hawkesford. In this design, highly localized negative feedback in the output stage maintains very low output impedance over a wide operating band. A Meridian engineer characterized its operating mode as “almost idealized Class B,” adding that it achieves very low quiescent current draw (about 1 milliamper) despite all devices being turned on at all times. The power supply includes bifilar transformer

windings, which are said to enhance rail stiffness, and custom-made Samwah storage caps. Protection consists of output stage overexcursion and thermal sensors that simply clamp the outputs under dangerous conditions, as well as a conventional line fuse.

Measurements

Following my usual practice, I completed my listening before putting the Meridian under the microscope. My bench-test results were pretty close to faultless by most standards of modern amplifier performance. (Except as indicated, I made all measurements via the 557's unbalanced RCA inputs.)

I powered the amp from an ordinary household AC circuit. As a result, line voltage sagged by 4 to 5 volts when I drove both the Meridian's channels into clipping while driving 4-ohm loads. This is a fairly common phenomenon, and the 557 still easily passed its specified power hurdles. I suspect that perhaps 5% more power might be on tap if I had a stiffer AC source (such as the development-lab supplies on which many amp manufacturers derive power specs). But for most of us, typical domestic wiring will have to suffice. Unless you routinely clip your amps while listening to organ music, it shouldn't matter.

In stereo, the Meridian 557 delivered around 220 watts per channel at its clipping point into 8-ohm loads and 350 watts at 4 ohms. When bridged for single-channel output, the 557 produced 710 watts into 8 ohms and something in excess of 1 kilowatt into 4 ohms. (I cannot configure a 4-ohm resistive load to handle more than 1 kilowatt and was reluctant to risk melting my expensive power resistor.) Meridian specifies bridged power at 4 ohms, but its instructions for mono connection refer to “a loudspeaker of 6 to 15 ohms.”

Frequency response was very flat in all modes (note the expanded vertical scale in Fig. 1). The results shown for 1-watt output

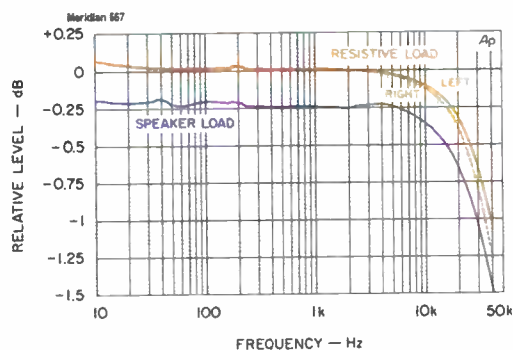
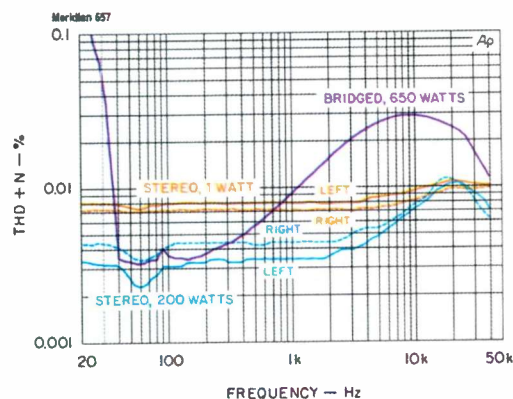
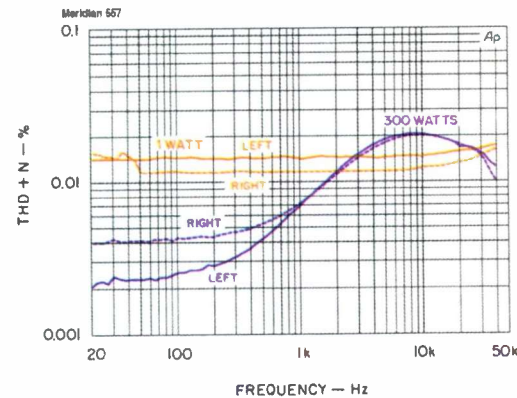


Fig. 1—Frequency response.



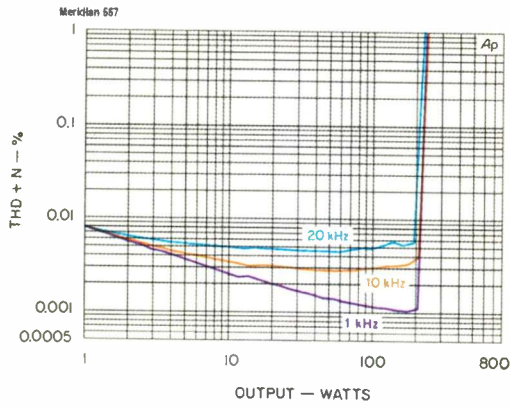
A



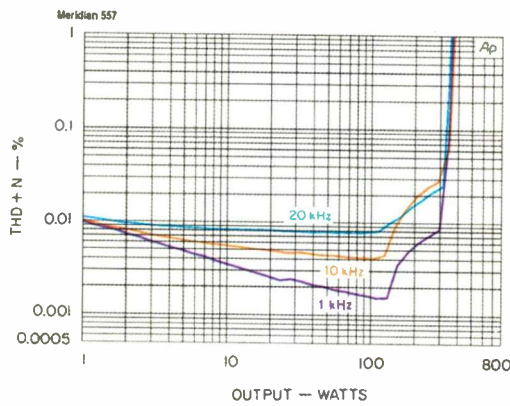
B

Fig. 2—THD + N vs. frequency with 8-ohm loads (A) and 4-ohm loads (B).

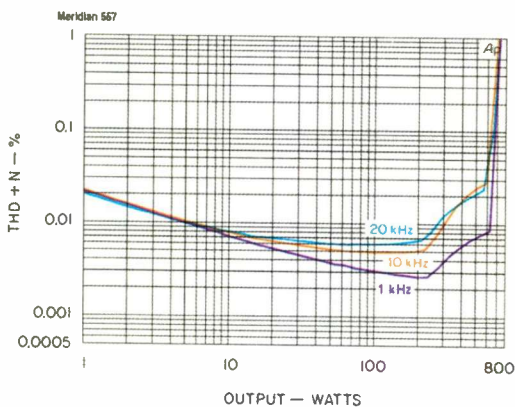
and an 8-ohm resistive load were essentially unchanged with 4-ohm loads, in bridged mode, and at various other power levels. The curve for left-channel response into a speaker load (a typical small, sealed-box two-way loudspeaker) is a near image of the resistive-load curves—so near, in fact, that I had to lower it by 0.25 dB so you could see it. This extreme similarity, which augurs well for consistent performance with a



A



B



C

Fig. 3—THD + N vs. output power for stereo operation into 8-ohm loads (A), stereo into 4-ohm loads (B), and bridged operation into 8-ohm load (C).

range of loudspeakers, can be credited to the 557's very low and excellently consistent output impedance. That impedance measured just 0.02 ohm at 1 kHz and was virtually constant up to about 8 kHz. When viewed another way, the 557's damping factor was high, at 405, out to several kilohertz, falling only to 113 at 20 kHz.

I tested total harmonic distortion plus noise (THD + N) versus frequency at rated power—200 watts in stereo and 650 watts bridged into 8 ohms (Fig. 2A) and 300 watts into 4 ohms (Fig. 2B)—and at 1 watt. The results are in no way unexpected, except perhaps for the relatively higher distortion in bridged mode at low frequencies with 8-ohm loading. (This topped out at about 0.3%—still negligible—at 15 Hz.) I suspect that has more to do with the bridging input circuitry than with the Meridian 557's amplification.

When plotting THD + N versus power output (Fig. 3), it's customary to show distortion at 20 Hz, 1 kHz, and 20 kHz. However, the Meridian's distortion at all lower frequencies was effectively identical to the 1-kHz results, so I have plotted distortion for 1, 10, and 20 kHz. Both channels were exercised for this test and yielded virtually identical results, so I am showing only the left channel's. The results for 8-ohm loading (Fig. 3A) exhibit the usual slight increase in distortion as frequency and power rise, but THD + N remains very low right up to the clipping point of around 225 watts at all frequencies. Nothing significant, other than the clipping point, changes with 4-ohm loading (Fig. 3B) or bridged operation into an 8-ohm load (Fig. 3C).

I found IHF dynamic headroom to be around 1 dB for 8-ohm and bridged operation and a slightly more significant 1.3 dB for 4-ohm stereo use. Note, however, that the 557's clipping headroom (power at clipping divided by rated power) is itself approximately 0.5 dB, so true dynamic headroom (short-term headroom above steady-state clipping) is actually pretty negligible.

In all, the 557 is one of the best-behaved high-power amplifiers I've seen. It's worth noting that it achieved these fine results with about 115 volts from the AC line at full power and that it did not once buzz, spark, shut down (except when deliberately shorted by

a screwdriver), emit dangerous aromas, or otherwise exhibit displeasure. It didn't even get particularly hot. (An hour running at one-third power made its surfaces quite warm but not uncomfortably hot.)

A noise spectrum at 1 watt out into 8 ohms (Fig. 4) confirms that the 557 meets or surpasses Meridian's noise rating of -90 dB (noise in bridged mode does rise a bit higher than that, but only above 20 kHz). Bridged-mode noise is 6 dB higher than in stereo mode, which is pretty normal for the sort of active-input balanced design used in this amp. The more dramatic increase in 60- and 120-Hz hum with bridged operation is less immediately explicable; it, and the 300-Hz peak I take to be associated with it, could be inherent in the amplifier, but they stand an almost equal chance of being ground gremlins in my test setup. (I did try all the usual grounding and cabling permutations to eliminate them.) Either way,



THE 557'S FREQUENCY RESPONSE WITH A REAL SPEAKER LOAD WAS VIRTUALLY THE SAME AS INTO A RESISTOR.

though, the balanced connection's common-mode rejection should substantially outweigh even noise of this magnitude in environments where induced noise is a potential problem. But, as I've found more than once, ordinary unbalanced wiring could well be the better choice in many homes.

Channel separation at 1 watt out was at least 75 dB at all audio frequencies, which is very fine. The Meridian's A-weighted S/N ratio, around 90 dB (83 dB balanced), was several decibels short of the best power amps I've measured but 6 dB or so better than merely average ones. More important

MEASURED DATA

Output Power at Clipping (1% THD + N at 1 kHz): 8-ohm loads, 221 watts/channel; 4-ohm loads, 350 watts/channel; bridged mode, 8-ohm load, 710 watts; bridged mode, 4-ohm load, more than 995 watts (see text).

Dynamic Output Power: 8-ohm loads, 256 watts/channel; 4-ohm loads, 473 watts/channel; bridged mode, 8-ohm load, 798 watts.

Dynamic Headroom re Rated Output: 8-ohm loads, +1 dB; 4-ohm loads, +1.3 dB; bridged mode, 8-ohm load, +0.9 dB.

THD + N, 20 Hz to 20 kHz: 8-ohm loads, less than 0.01% at rated output and less than 0.03% at 20 watts and at 1 watt; 4-ohm loads, 0.04% at rated output, less than 0.03% at 20 watts, and 0.03% at 1 watt.

Damping Factor re 8-Ohm Loads: From 20 Hz to 1 kHz, 405; at 20 kHz, 113.

Output Impedance: 20 milliohms at 1 kHz.

Frequency Response: 20 Hz to 20 kHz, +0, -0.3 dB.

Sensitivity: For 1 watt (0 dBW) into 8-ohm loads, 158 mV; for rated output into 8-ohm loads, 1.43 V.

A-Weighted S/N: Unbalanced input, 89.7 dB; balanced input, 83 dB.

Input Impedance: Unbalanced, 15 kilohms; balanced, 34 kilohms.

Channel Separation: Greater than 75 dB, 20 Hz to 20 kHz.

Channel Balance: Within 0.05 dB, 20 Hz to 20 kHz.

to me, the 557 was utterly free of any mechanical transformer buzz (which absolutely drives me *crazy*) and of any fan noise. So it's real-world quiet, a big plus in my book.

Use and Listening Tests

I auditioned the Meridian 557 in the simplest possible system. I fed the amp's unbalanced inputs from a high-performance CD player whose analog volume control could be adjusted from the player's remote. The loudspeakers I elected to use were Platinum Audio Solos, which I duti-

fully bi-wired to the 557's dual pairs of binding posts using Wireworld cables. The Solos are small but unusually capable, with solid output down to about 40 Hz and—usefully for amplifier evaluations—relatively low sensitivity (about 85 dB at 1 meter for a 1-watt input).

Meridian's amplifier powered this stripped-down setup with just about total mastery. Dynamic contrasts were fully involving, yet treble delicacy and bass authority were both absolutely top-shelf. Reference Recordings' latest serving of ultra-brass music from Frederick Fennell, *Marches I've Missed* (RR-85 HDCD), sounded terrific. The combination of big bass drum and superbly recorded cymbal work is a stern test for any system, particularly one with a small, vented speaker. The 557 passed that test easily. The trio sections of these marches typically combine a steady tuba "oomp-pah" sound with bass drum and up-beat cymbals. The "Hall of Fame" march on track 12 is a typical example, demanding plenty of power and tight speaker control to produce a natural, unwavering playback without floppy drum sound or smeared cymbals. The Meridian supplied that power and control with ease.

The 557 had ample power for these highly dynamic recordings, and it kept the small Platinums under strict control, free from bass bloat or ringing. It also produced sumptuously detailed sound from a wide variety of CDs. I've recently been spending time (too much!) renewing my acquaintance with Shostakovich's monumental string quartet cycle, as played by the Éder String Quartet. (The six volumes on Naxos are available at a great price and carry quite lovely recordings made in a Budapest church.) The hypnotic opening of the 15th quartet's *Serenade* (Naxos 8.550976) requires both extreme delicacy and substantial dynamic range. It sounded dramatically alive and naturally etched, with a rich sense of space and depth, especially when played back in an absolutely silent room. The Meridian contributed absolutely no audible noise—electrical or mechanical. Hearing this system reinforced my belief that there's no real substitute for large amounts of high-quality power, even for music pro-

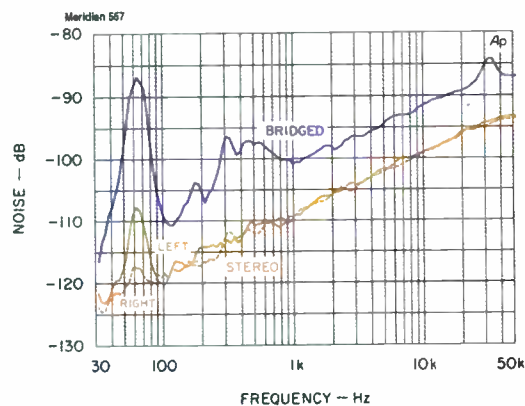


Fig. 4—Noise analysis.

grams as dynamically "modest" (hah!) as string quartets.

Lyle Lovett's *I Love Everybody* (MCAD-10808) has some terrific tracks, including an outstandingly up-front and snappy trap drum on "Penguins" that sounded satisfyingly punchy and believable through the 557. With the Meridian at work, stand-up

**IN ALL MY TESTS,
THE MERIDIAN 557
WAS PRETTY CLOSE
TO FAULTLESS.**

bass—on such cuts as "La to the Left"—carried natural weight, and the extremely natural vocal recording and very fine detail shined through over the entire album.

This latest version of Meridian's 557 delivered the transparency and nuance I'm accustomed to hearing from top-flight systems while providing more than enough power reserve for my studio's 2,500+ cubic feet. When I deliberately clipped the amp on high-level rock, its sound first hardened a bit and then grew harsh at about the expected rate, which is to say, comparatively quickly. But I could not get the 557 to reach this point, even with the decidedly low-sensitivity Solos, under any sort of normal listening. And short of such deliberate clipping, I was entirely unable to hear any particular characteristic that could be attributed to the Meridian. I believe, in short, this is a very fine amplifier and one that is finely made.

When was the last time your speakers made you look twice?



INTRODUCING

Gekko™ Flat Speakers, a visual revolution in sound.

Gekko™ Flat Speakers deliver the most advanced sound wave technology in a revolutionary design that will make you look (and listen) twice.

Gekko Flat Speakers are remarkably thin (less than two inches thick) and ideal for wall mounting. This means

that music is carried at ear level, not foot level. Plus, patented Sweet Space™ technology spreads sound out to every space in the room. Whether for home theater, or music enthusiasts, Gekko Flat Speakers disperse sound waves evenly so everyone everywhere can appreciate superior sound.

And, Gekko Flat Speakers don't only sound great, they also look great. The ArtGekko™ Collection provides top-quality art prints and specialty frames that cover your speaker. Now your musical taste and artistic vision are blended in one speaker that offers a truly multi-sensory experience.

GEKKO™

THE NEW VISION IN SOUND

Call our toll-free number to learn about Gekko Flat Speakers, or look us up on the web at www.gekkoaudio.com.

1-800-278-3526

NCT Audio Products, Inc. One Dock Street, Suite #300, Stamford, CT 06902

AURICLE

BASCOM H. KING

TANNOY CHURCHILL SPEAKER



The Churchill's external crossover is finished to match the main enclosure.

I have long known and respected Tannoy's Dual Concentric two-way coaxial speakers. Every model I've heard has delivered easy, natural, and musical sound with realistic dynamics. But I'd never had one in my home system until I auditioned the Churchill, currently the top model in Tannoy's North American line.

The Churchill is a formidable, distinctive, and quite beautiful hunk of speaker, weighing in at 180 pounds (plus 35 pounds for its external crossover) and priced at \$14,000 per pair. The enclosure is designed to minimize internal standing waves: Its trapezoidal shape minimizes lateral reflections, while vertical reflections are minimized by the V-shaped port's duct, which bisects the cabinet's interior. Every enclosure is hand-crafted to traditional fine furniture standards from hardwoods and has Gaboon ebony edging.

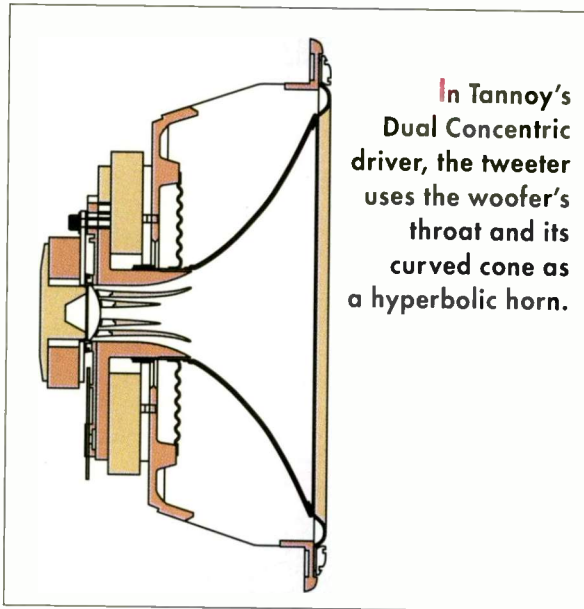
Company Address: c/o TGI North America, 300 Gage Ave., Suite 1, Kitchener, Ont. N2M 2C8, Canada; 519/745-1158; www.tannoy.com.



Bisecting the cabinet is a V-shaped port duct, to minimize vertical reflections.

A removable panel on the back enables you to tune the Churchill's bass by adding lead shot or by adding or removing batts of open-cell foam, neither of which I tried. Tannoy says adding shot will make the bass sound a bit more solid by enhancing the enclosure's coupling to the floor and by making the cabinet even less likely to resonate. The company also says that removing one or two of the four foam batts in the cabinet will slightly raise the enclosure's tuning frequency, giving you more energy between 30 and 50 Hz but less below 30 Hz.

THE TANNOY CHURCHILL IS A FORMIDABLE, DISTINCTIVE, AND QUITE BEAUTIFUL HUNK OF SPEAKER.



In Tannoy's Dual Concentric driver, the tweeter uses the woofer's throat and its curved cone as a hyperbolic horn.

(Anyone who wants to extend the bass lower at the expense of output between 30 and 50 Hz can get additional batts from TGI, Tannoy's distributor.)

The Churchill's 15-inch driver is an updated version of the Dual Concentric drivers Tannoy has been using since 1947. In the Dual Concentric design, a horn tweeter's magnetic system and diaphragm are behind the woofer's voice coil and magnet structure. The tweeter's horn begins as a flared waveguide in the woofer's pole piece and is continued by the hyperbolic curve of the rigid woofer cone. The horn, together with the design of the crossover, is said to produce a coherent spherical acoustic wavefront. The voice coil of the Churchill's tweeter is immersed in a cooling magnetic liquid (presumably Ferrofluid), the woofer has a large edge-wound voice coil (2 inches in diameter), and the driver's frame is a very rigid casting.

The Churchill's crossover is specified at 1 kHz and uses a fourth-order low-pass filter and a second-order high-pass. It's in a separate cabinet, for isolation from microphonic effects caused by sound-pressure variations within the speaker enclosure. The crossover's Solen Hepta-Litz inductors are arranged in a magnetic-null orientation for minimum interaction. Matched Solen capacitors and Dale precision resistors are also used. Dual WBT input connectors enable bi-wiring from your power amplifiers to the crossover input. A shielded multi-conductor Kimber Kable connects the crossover to the speaker via a large Neutrik twist-lock, high-current connector. The

connector's size and the cable's length let you place the crossover 6 to 14 inches from the speaker; if the crossover is near the speaker, any excess cable will slide into the crossover's cabinet.

I placed the Churchills well out in my listening room, a position I'd found good for Dunlavy SC-III and B&W 801 Matrix Series 3 speakers. It was immediately obvious that the Tannoys had a very neutral, honest sound and that they presented the dynamics of music in a more realistic and palpable way than those other speakers. I was struck with how big and powerful the sound was. Bass quality and extension were the best I have experienced from speakers far out in the room, even though I was using a pair of 9-watt amplifiers (experimental single-ended amps, with 300B output tubes, designed by Mike Sanders of Quicksilver Audio). But then, the Churchills are unusually sensitive speakers, rated at 95 dB SPL (anechoic, not half-space) at 1 meter for a 2.83-volt input.

(I have since had great success using these speakers with other amplifiers: the Manley Labs Stingray and E.A.R. V20 integrated stereo tube amplifiers, the single-ended DeHavilland Electric Company Aries mono and Wyetech Topaz 211A stereo tube power amps, Quicksilver Audio Silver 60 and M135 mono push-pull tube power amps, a Sumo Polaris solid-state stereo power amp, and an Arnoux 7B digital switching amplifier.)

The Tannoy Churchills did not have as wide and well-defined a soundstage as the Dunlavy SC-IIIs, but they imaged nicely in my setup. Their tonal balance was quite good, and the slightly excessive mid-bass I sometimes hear in my room was absent. Somehow, high frequencies were easier to hear yet weren't overly bright. Clarity and delineation of detail were quite thrilling. In fact, the Churchills' clarity and resolution make them excellent tools for hearing dif-

ferences in other components of the listening chain. Some of my friends could hear a small horn "honk" near 1 kHz, the crossover frequency, but I can't really say that I heard it—at most, I could imagine I heard it if I listened really hard.

I augmented my listening impressions with some measurements. The Churchills' step response, as captured by a MLSSA system, indicated that the woofer and tweeter were in phase but that the tweeter's signal arrived about 270 microseconds before the woofer's, whether the test was made 1 or 2 meters away from the speaker. The Churchill's quasi-anechoic frequency response was reasonably smooth and extended well past 20 kHz.

Tannoy's literature states that the Churchill is "impedance compensated," with special networks in the crossover making the speaker's impedance phase and amplitude fairly constant with frequency, like a resistor's. However, Tannoy provides this compensation only in the middle and upper frequencies (my testing confirmed this). From 200 Hz up, this 8-ohm speaker's impedance stayed between 5.6 and 8.8 ohms, which is quite reasonable, but in the bass it varied

from 4.5 ohms at 131 Hz to 21 ohms at the enclosure peak, 45 Hz. The 45-Hz peak, says Tannoy, "helps tube amps—especially single-ended designs—come to life." (The Churchill's impedance phase was

about -53° at 53 Hz but stayed within $\pm 20^\circ$ from 80 Hz to 20 kHz.) According to Tannoy, a flat midband and high-frequency impedance characteristic is also very helpful to tube amps, which are quite sensitive to impedance variations there. (This is borne out when I use a dummy speaker load to test tube amplifiers' frequency responses.) Impedance variations give solid-state amps no problem in terms of frequency response.

I was quite impressed with the Churchills and truly enjoyed my time with them. If they're a bit too rich for your blood, my favorable impressions of other Tannoy loudspeakers lead me to recommend that you check out some of the company's less-expensive systems. A

I WAS IMMEDIATELY AWARE OF THE TANNOYS' REALISTIC, PALPABLE DYNAMIC AND NEUTRAL, HONEST SOUND.

PARLIAMENT

Lights



THE
PERFECT RECESS



© Philip Morris Inc. 1999

8 mg "tar," 0.6 mg nicotine av.
per cigarette by FTC method.

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

ADCOM GCD-750 CD PLAYER



Adcom's GCD-750 is priced at \$1,250—affordable, but a step up from the many moderately priced (\$300 to \$700) CD players that sound really good. The GCD-750 is also a step up in performance, giving you good high-end sound that falls short of the ultra-high end by a surprisingly small margin. Although its price is serious money, this player takes you seriously into the music, revealing the best recordings' finest details with only a minimum of digital hardening.

The GCD-750's useful features include a large LCD screen (though it's

Company Address: 10 Timber Lane, Marlboro, N.J. 07746; 732/683-2356; www.adcom.com.

hard to read off axis), front-panel LED indicators (for power, digital lock, and HDCD), and a remote that can also control an Adcom preamp.

There are balanced and unbalanced analog outputs and a coaxial digital input so that you can use the 750 as a D/A converter for other sources.

Its unusually rugged transport incorporates a high-quality three-beam laser assembly (one beam to read data from the CD, two side beams to maintain tracking accuracy), cradled in a heavy steel chassis for stability and shock protection.

Digital data is passed, via a Pacific Microsonics 20-bit HDCD filter, to

two differential pairs of Burr-Brown 1702 premium 20-bit DACs, which Adcom says sound better than even some 24-bit DACs. Each DAC has its own locally regulated power supply to maintain channel matching; all told, the GCD-750 has seven regulated power supplies.

The audio section of a CD player is as important as its digital and DAC sections, and the GCD-750's draws on the work of Nelson Pass and Adcom's experience with its GFP-750 preamp and GFA-5802 power amp. (In fact, that amp and preamp and this player make one hell of a combination.) The 750's analog stage is Class-A and follows Pass's minimalist philosophy of keeping circuit paths as simple as possible for quick reactions to transients and accurate reproduction of low-level signals. Adcom uses very fast discrete MOS-FET devices here and says that this enables dithering to be "tuned . . . [to] smooth out harshness without losing essential detail."

Although that last claim sounds a bit like the advertising copy for a filter cigarette, the GCD-750 is a lot smoother and sweeter than most of its competition and has very good warmth and depth. It isn't tube-like, but it does very well indeed in making natural recordings come alive. With this player, you can tell why so many audiophiles fall in love with

**THE GCD-750'S SOUND
FALLS SHORT OF
THE ULTRA HIGH END BY
A FAR SMALLER MARGIN
THAN ITS PRICE DOES.**

Mercury Living Presence CDs and high-quality CD remasterings of Reiner's Chicago Symphony recordings. With thinner-sounding play-

ers or those having a shallow and more two-dimensional soundstage, the reasons for this passion can be a real mystery.

The GCD-750 was equally good at revealing the virtues of good new recordings, of course. The sound of HDCD recordings was among the best I've heard from moderately

priced CD players. The 750 conveyed the sonic advantages of Telarc's and Chesky's best recordings, the quality of the hall sounds and ambience in Dorian CDs, and the benefits of Classic Records' and Mobile Fidelity's very fine remastering.

The GCD-750's overall timbre may seem slightly soft or forgiving until you realize you're still hearing musical detail but not the touch of upper-octave hardness and glare that's all too common among competing CD players. Top-octave transparency was exceptional for a unit in this price range. Midrange and upper-octave detail was not smoothed away to make the sound more forgiving. Bass was very good, detailed, and extended—another test of a good CD player.

**THE TIMBRE MAY SOUND
SOFT AND FORGIVING—
UNTIL YOU REALIZE
HOW MUCH MUSICAL
DETAIL YOU CAN HEAR.**

The GCD-750's dynamics and transients were very good and musically lifelike, if not up to those of state-of-the-art players. Dynamic contrasts were musically natural, with a slight mid-hall perspective that was far more listenable than the more aggressive dynamics of many other players.

The Adcom's mix of timbre and dynamics resulted in very natural reproduction of instruments and of male and female voices, with unusually good preservation of mid-range warmth. There was none of the percussive hardness I hear from many CD players on loud piano and harpsichord passages, nor was there any tendency to harden the sounds of stringed instruments or tenor or soprano voices—a trait particularly obnoxious with closely miked recordings. The GCD-750 simply sounded musical.

It still takes top bucks to get top quality. But the Adcom GCD-750 does deliver true high-end sound and gives you excellent value for the money. It faces competition in the under-\$2,000 price range, but don't let any dealer tell you that you must pay more just to get high-end sound. Many players selling for \$2,000 or more don't sound better; a surprising number sound worse. A

Find What You're Looking For Without Leaving Home!



Make shopping easy

Discover the fun, comfortable alternative to hassling with traffic, parking and crowds. Get the Crutchfield catalog.

You'll love the selection

Crutchfield brings you the line-up of virtually every major brand, including Sony and Sony ES, Pioneer, Kenwood, Yamaha, Polk Audio, NHT, Infinity, and Eosone. You get to see the whole line, not just a few selected models.

You'll appreciate our approach

You get straightforward, no-hype coverage of each model's features and specs, detailed color photos, and exclusive comparison charts.

Can't afford what you really want?

Inside the Crutchfield catalog, you'll also discover the secret to taking our discount prices even further. It's the Easy Payment option, a painless way of making even the very best equipment affordable. So don't wait. Get your copy on its way today.

Call today for your FREE catalog!

1-800-955-9009

Ask for extension "AU"

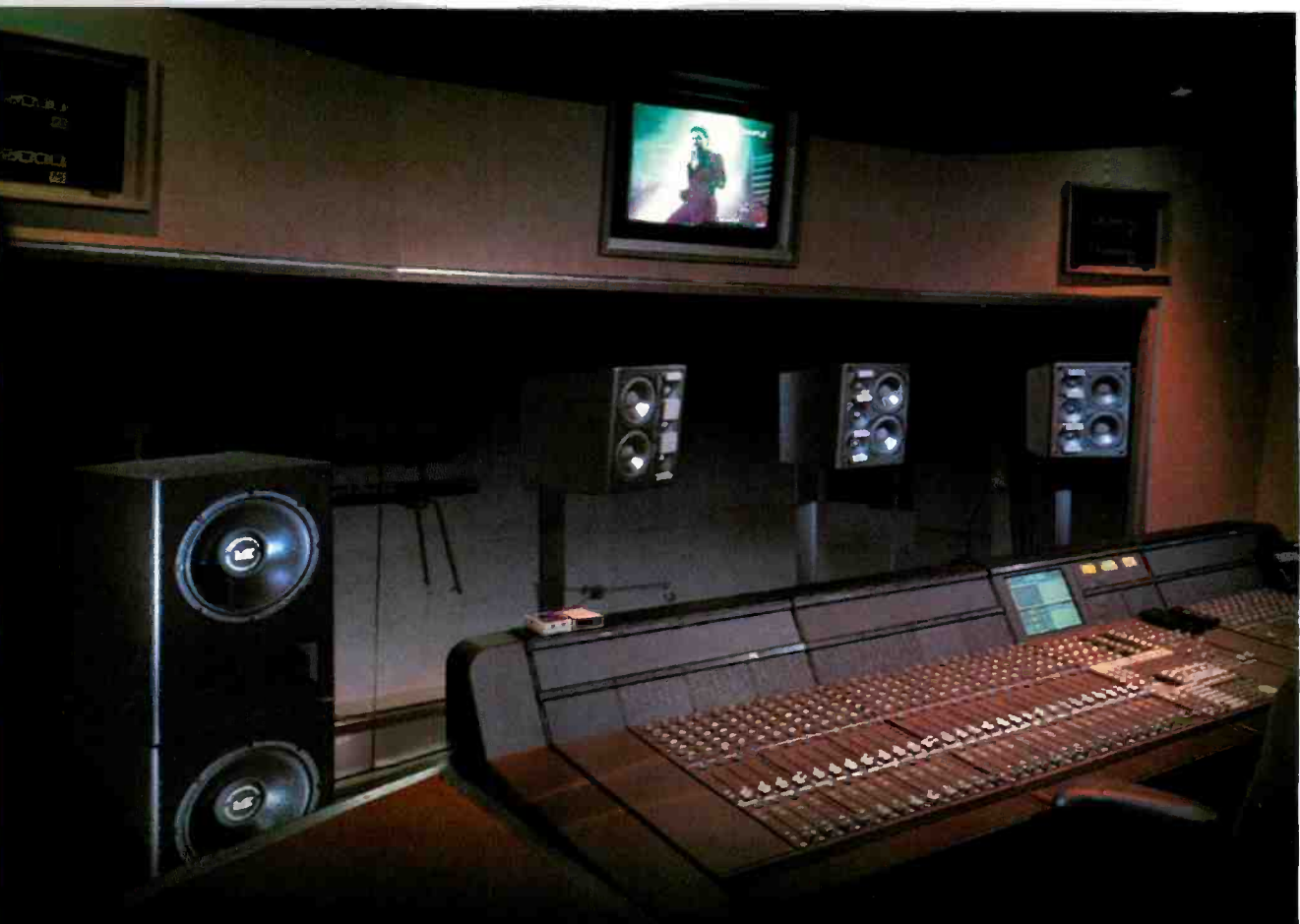
Or visit our website at www.crutchfield.com

Shop online • Request a free catalog • Browse our Info Library

CRUTCHFIELD®

The Complete Car Stereo and Home Audio/Video Catalog

Miller & Kreisel



The M&K Subwoofers

**Better Built. Better Sound.
Longer Warranty. Studio-Proven.**

You Can Even Check Our References.

Skywalker Sound, Sony Music, Warner Bros, 20th Century Fox, Dolby, DTS, and more than 100 of the world's most respected studios use M&K subwoofers for their most critical listening decisions. Does your home system deserve anything less?

For 25 years, M&K subwoofers—like all M&K home speakers—have brought the sound of the studio into thousands of homes. From our industry reference MX-5000 II (one of four THX-certified subs) to the tiny and powerful VX-100, M&K has a model for your specific application and budget.

Visit your nearest M&K dealer for a complete demonstration. Who knows? One day you might even be one of our strongest references.



Miller & Kreisel Sound Corporation

10391 Jefferson Blvd. Culver City, CA 90232 · 310/204-2854 · fax 310/202-8782
faxback 800/414-7744 · www.mksound.com



Dunlavy Audio Labs' SC-Vs will likely attract two types of audiophiles: those who can afford to pay \$14,995 for a pair of speakers and those who are interested in the finest equipment while dreaming of someday being able to afford it. I have good news for both. Potential buyers will find that the SC-V has few competitors under \$20,000. And those who are put off by price will find much of the same voicing—save for the SC-V's awesome deep bass—in Dunlavy's less expensive speakers. During a visit to the company's plant, where I heard A/B comparisons of those other models, I found that most of my impressions about the SC-Vs (if you make allowances for price differences and a few sonic subtleties) apply to Dunlavy speakers costing as little as \$3,995 a pair. And that's a pretty affordable dream.

Few speakers come close to delivering the Dunlavy SC-V's tight, deep, room-moving bass. Its timbre is excellent, as are its dynamics and transient performance. This is a truly clean and transparent speaker, and it approaches the holographic imaging and depth of the best small monitors.

Aside from cost, the SC-V's main drawback is that it is big. It is nicely styled and finished for a large, rectangular box, though no amount of styling can disguise the fact that it is 75½ inches tall, 27 inches deep, and 15 inches wide. Because this speaker weighs 330 pounds, including its detachable wood base, it takes a bit of manhandling to position. Yet you do need massive speakers if you want the kind of true deep bass that you can get only from large sealed enclosures. And the SC-V's heft—together with its construction of laminated, veneered fiberboard (ranging from ¾ inch to 2 inches thick)—superbly

Company Address: P.O. Box 49399, Colorado Springs, Colo. 80949; 719/592-1159; www.dunlavyaudio.com.

AURICLE
ANTHONY H. CORDESMAN

DUNLAVY AUDIO LABS SC-V SPEAKER



minimizes cabinet vibrations at all frequencies. This is particularly important in a speaker that can deliver massive power below 25 Hz. Sound-absorbing material is used on all relevant surfaces, to minimize diffraction. I never found the Dunlavy SC-Vs vibrating or coloring any part of the frequency spectrum, even at the highest listening levels.

The SC-V reflects the design values of John Dunlavy, whose back-

ground is in aerospace and electronics and who is highly respected for his innovations in audio and antenna design. Dunlavy stresses the importance of applying engineering theory to speaker design and verifying the success of a design through measurement. Here, he has placed the SC-V's seven drivers (two 12-inch woofers, two 6½-inch mid-bass drivers, two 3-inch midranges, and one 1-inch fabric-dome tweeter) so

as to preserve their phase alignment, reduce room boundary effects, and maintain sharp stereo imaging. The boundary-effect reduction stems from a vertically symmetrical driver array that simulates a point source at reasonable listening distances. Dunlavy believes that this configuration usually provides the best and smoothest sound coupling to a typical room. And it avoids lobing, thus reducing the amount of sound reflected from the floor between the loudspeaker and the listener. The SC-V's driver array is also horizontally symmetrical so that the stereo image will not skew or blur.

Dunlavy does not use radical driver designs, because he finds that ribbons and most electrostatics do not measure or perform as well as cones and domes. He also believes that diaphragms made of ceramics or exotic metals store energy because they lack internal damping and thus are subject to ringing and phase distortion that can degrade impulse response. I don't agree with all of Dunlavy's views, because I have listened to outstanding speakers whose drivers violate his principles. Nevertheless, his driver choices enabled the SC-V to provide some of the best sound I have yet heard.

I was likewise impressed by Dunlavy Audio Labs' exceptional quality control. The company has three anechoic chambers, including a small one used for measuring each driver to make sure it meets or exceeds its specs. Every speaker system is tested in a larger chamber, after which the company may tune each crossover (always a first-order, phase-coherent design) and fine-tune the driver selection. (The anechoic test data for every system is kept on permanent file.) For these reasons, Dunlavy can confidently specify frequency response with a tolerance of ± 1 dB for all its speakers.

It's therefore not surprising that the SC-V's rated frequency response looks more like a preamp's than a speaker's: ± 1 dB from 25 Hz to 22 kHz and -1.5 dB at 20 Hz, measured at realistic listening distances of $7\frac{1}{2}$ to 20 feet. Its impedance, nominally 4 ohms, ranges from a minimum of 3 ohms to

a maximum of 6 ohms, and rated sensitivity is 91 dB (though the SC-V sounded more efficient to me than many speakers with the same specification). Dunlavy recommends at least 100 watts of amplifier power per channel to get the best dynamics from this speaker, but I found a 70-watt tube amplifier could drive it very well indeed.

Only a few speaker manufacturers have the courage to provide performance curves for anything other than on-axis frequency response, and they usually measure that at ideal distances and using low signal levels. Dunlavy, however, provides test results to back up its claims that the SC-V has "extremely flat amplitude and phase response, incredibly low distortion, true phase

coherency, simulated point-source radiation, inaudible cabinet diffraction, symmetrical radiation patterns, broad vertical/horizontal dispersion, and precise pair matching." All of these tests and their

purpose are fully described on the Dunlavy Audio Labs Web page.

The Dunlavy SC-V is simultaneously one of the most accurate and one of the most musical speakers ever made. I spent two months relistening to my collection of CDs as well as to the new 24-bit/96-kHz recordings from Chesky and Classic Records. The SC-Vs provided as much—and as musically right—detail as I have heard from any speakers. Their cone and dome drivers revealed as much musical detail as the best ribbon drivers I've auditioned. I could clearly hear the subtle differences between different pressings of the same record and between original and remastered versions of CDs, not to mention the differences between 24-bit/96-kHz and 16-bit/44.1-kHz versions of the same recordings. These are very revealing speakers.

The SC-Vs had very smooth overall frequency response, and their timbre was consistent at every volume level. They had much more dynamic life than most large speakers, with a touch of the energy and excitement I normally associate with horn speakers. This made them exceptionally good at handling rapid dynamic contrasts and transients, and there was no tendency

to compress the music at any level. My only reservation about timbre is that *any* high-end speaker that is flat beyond 20 kHz at the listening position can be a bit merciless in revealing minor signal defects. With the SC-V, there was none of the hardness I've heard from some speakers, but its flat upper-octave response was not romantic or forgiving.

The SC-V's bass was stunning, more or less tied for the title of best bass I've ever heard with the VMPS Super Tower III Special Ribbon Edition (which I reviewed in the August 1998 issue). The Dunlavy reproduced tons of bass below 30 Hz, down into the region where you feel it more than hear it. Even though the standing waves in my room prevented me from fully exploring the lower limits of the SC-V's response, the ultra-low bass I could hear was powerful and extremely clean.

This speaker did extremely well with the incredibly deep bass on Jean Guillou's performance of Mussorgsky's *Pictures at an Exhibition* (Dorian DOR-99117) and on other organ recordings. It had outstanding transient performance on percussion, including bass-drum spectaculars like the opening passages of "Fanfare for the Common Man" on Aaron Copland's *The Music of America* (Telarc CD-80339). You owe it to yourself to listen to this speaker to hear how tight and deep bass can go and how clean it can be. I was particularly impressed by the SC-V's ability to handle the very deep bass on tracks 1 and 8 of Jennifer Warnes' *The Hunter* (Private Music 01005-82089) without thickening or adding any coloration to her voice. The SC-V also provided the most natural reproduction I have heard of Ray Brown's bass viol trio on *SuperBass* (Telarc CD-83393), preserving all of the soundstage detail and ambience and the lower-midrange dynamics.

The SC-V's superb bass response would not matter much if the Dunlavy were not equally good in every other area. Place it carefully (as called for in its owner's manual), sit at least 7 feet away, and the output from its drivers will blend seamlessly into an almost point-source sound. Like the Thiel CS7.2, the SC-V demonstrates that large speakers can provide all the focus and soundstage detail of the best small monitors but with none of their limitations in frequency response and dynamics.

**THE SC-V COMBINES
MASSIVE BASS WITH THE
HOLOGRAPHIC IMAGING
OF THE BEST
SMALL MONITORS.**

Angling the SC-Vs to get that soundstage took some experimentation, despite Dunlavy's excellent instructions and the additional setup information on its Web site. I got best results by placing the speakers fairly far apart on the long wall of my room and toeing them in toward me.

No top-quality speaker can deliver its best soundstage over a wide area, yet the SC-V's soundstage was wide enough to let me and two others hear the Dunlavys at their best. This speaker was musical from virtually any listening position. And minor changes in listening position and head movements had no impact on imaging or on the mix of upper-octave energy.

The SC-V's ability to present the best soundstage from recordings of virtually any type, from solo guitar to opera, was impressive. You can get more detail only from a few ribbon speakers—but that detail might actually stem from a touch of ringing in the ribbon. This speaker's string and woodwind tone and definition were excellent, and it reproduced all the details of female voice quite naturally. I often use Judy Collins' recordings—it really doesn't seem to matter which one—to hear how a speaker deals with breathing and "shh" sounds. Some speakers make her aspirates hard, some soften them, but the SC-V got them right.

The Dunlavy SC-V reproduced the midrange and upper octaves of solo violin and piano accurately. Its exceptionally clean upper-octave harmonics came through quite clearly on flute, solo violin, the upper register of the piano, cymbals, and the full range of brush and snare-drum sounds.


I disagree with John Dunlavy on one point, which bears only indirectly on his speakers. He feels very strongly that most high-end interconnects and cables use "smoke and mirrors" technology and do not deliver on their promises. He has made his own wires, based on what he feels are well-defined engineering principles, and they are quite good—though not, to my mind, as good as the SC-Vs. At the risk of seeming to prefer magic, I am using some very good interconnects and cables from AudioQuest, Discovery, and Wireworld, and I found that several of them had better midrange and upper-octave clarity and sweetness with my electronics than the Dunlavy cables did. I also kept coming back

to the Kimber Select speaker cables and interconnects I now use as a primary reference. They provided me with the smoothest midrange and upper octaves I could get from the SC-Vs, and they have superb definition. The Kimber Selects also rivaled the Wireworld products for the best bass. They did not have quite the overall bass power of the Dunlavy interconnects and speaker cables, but they had better definition and seemed to go slightly lower.

Despite the SC-V's price and despite my listening room's standing-wave problems,

which keep me from getting all the deep bass the Dunlavy could produce, I was so impressed that I have bought them to use as additional reference speakers. They can be driven by virtually any good stereo amp (or pair of mono amps), they are exceptionally efficient and dynamic, and they are both stunning and musical. But what I said at the beginning of this review bears repeating: Other speakers from Dunlavy Audio Labs have many of the SC-V's virtues, at lower prices, making audiophile dreams much more affordable. A

one bell, one whistle,



and a button to turn them off.

It's not about a pile of features you'll never use. It's about delivering the best sound for the dollar. The NAD 317 integrated amplifier is built simple to provide - foremost - a faithful and musical performance. And, as with all NAD products, it maintains a reputation for true value, performance and simplicity.

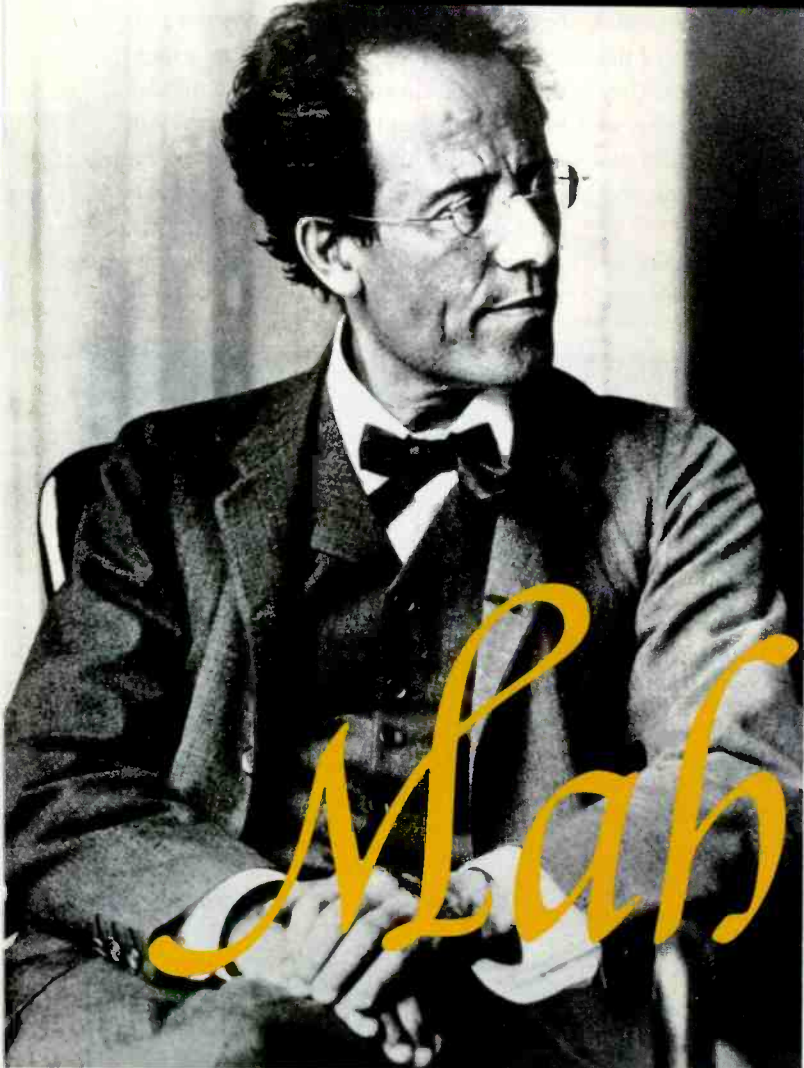
NAD - pressing all the right buttons.

NAD 317 Integrated Amplifier
 80 watts into 8 ohms, bridgeable to 240 watts,
 6 line level inputs (including 2 tape in/outputs),
 pre out/main in, all discrete circuitry,
 "defeatable Soft Clipping™", remote control with NAD Link.

NAD
pure. and simple.

800.263.4641 www.NADelectronics.com
 NAD Electronics of America, 6 Merchant Street, Sharon, MA 02067

CLASSICAL RECORDINGS



New York Philharmonic—The Mahler Broadcasts, 1948-1982

The New York Philharmonic with various conductors and soloists

NEW YORK PHILHARMONIC

NYP 9801-9812

12 CDs, ADD, 15:03:32

Sound: C to A, Performance: B to A+

Perhaps the best way to begin reviewing this historical Gustav Mahler compendium is to state that it deserves to be nominated as album of the year. This follow-up to the New York Philharmonic's highly successful first limited edition, *The Historic Broadcasts, 1923-1987*, is a 12-disc all-Mahler set that contains performances by some of the most distinguished players of the last half-century, a veritable cornucopia of

musical treasures. That two important Mahler conductors are missing can be ascribed to Mahler himself never having been involved in a broadcast and to Leonard Bernstein's available Mahler performances with the New York Philharmonic and other orchestras being on other labels. But look at what this box, with its six two-disc jewel cases, does contain!

The catalyst for my own Mahler enthusiasm happened to be the first performance featured here, which marked the return in 1959 of John Barbirolli, as guest, to the New York Philharmonic after 16 years. I attended both the Friday and Saturday performances and then listened to the Sunday broadcast. I was hooked, both by the work and by Barbirolli's atmospheric, characterful, and vivid conducting. But there was also frustration, for I never was able to find a copy of that notable broadcast. Were the price tag for this \$225 box only for that one performance, I would still be tempted to buy it.

It is not so easy to single out other favorites. The 1964 "Songs of a Wayfarer" with Dietrich Fischer-Dieskau and William Steinberg, which follows the First Symphony, is not only a fine performance but also, with the inclusion of two of its songs later appropriated by Mahler for that symphony, a clever bit of program sequencing. Another superb Barbirolli item is his Ninth, which is just a

little more personal and passionate than the conductor's recording with the Berlin Philharmonic. Each conductor—Pierre Boulez in the Third, Klaus Tennstedt in the Fifth, Dimitri Mitropoulos in the Sixth, Rafael Kubelik in the Seventh, Leopold Stokowski in the eighth, and Bruno Walter and the notable singing by Kathleen Ferrier in "Das Lied von der Erde"—in his own way presents his individual views of the composer's architectural structures, *weltschmerz*, resignation, sarcasms, and ecstatic visions as well as his own way of eliciting the sheer, overwhelming power of Mahler's music. All are among the best one can hear. Of course, several of these conductors (notably Boulez, Tennstedt, and Kubelik) made subsequent commercial recordings of this repertoire, all sonically more up-to-date. But these broadcasts are the ones that most effectively convey the sense of occasion.

Disappointments? In contrast to other "Resurrection" Symphony recordings, Zubin Mehta's No. 2, for all its erupting *graves* and apocalyptic noises, seems bent on superficial effects; one wishes his performance had more breadth as well as less glaring brasses. If Georg Solti's No. 4, with lovely singing from Irmgard Seefried in the finale, appears less enthralling than some other versions, it nonetheless is welcome for its lack of hypertension.

The first half-hour of the final two-disc album is devoted to gripping performances by Mitropoulos of the Ernst Krenek version of just two movements from the unfinished 10th Symphony (prior to Deryck Cooke's



Photograph: © Archive Photos

A \$5,000 SPEAKER WITH A \$2,000 PRICE TAG

Your goal when buying speakers should be simple:

"Find the best speaker at the best price."

At under \$2,000*, the Signature III from LEGACY is just that. With these performance advantages, it's hard to imagine why anyone would consider another speaker near this price range.

- Exclusive Ribbon Tweeter
- Tri-woofer Alignment
- Rear Ambient Tweeter
- Dynamic Braking System
- Ten Year Warranty
- Choice of 8 different wood finishes

Call us today at **1-800-283-4644** to receive our catalog. We'll be happy to discuss your system and room layout.

And with our

100% Satisfaction Guarantee

if you're not satisfied we'll pick them up at your door.**

LEGACY
A U D I O

3023 E. Sangamon Ave., Springfield, IL 62702
217-544-3178 • Fax: 217-544-1483
www.legacy-audio.com

OUR 1999 SHOWS: **April 24-25th** • Boonton, NJ • 421 Main St.
May 1st-2nd • Livonia, MI (Detroit) • 17123 N. Laurel Park Dr. (Holiday Inn)
October 16th-17th • Orlando, FL • Buena Vista Palace
November 5th-7th • Mason, OH (Cincinnati) • Ameri-Suites • 5070 Natorp Blvd

*A pair of Signature IIIs in a standard finish is \$3,850, an additional \$300 for a premium finish.

**Just call within 10 days of receiving our products. We'll have them picked up at your door, refund your original purchase price, and even pay the return shipping cost.



The most intimate union of
amplifier and loudspeaker.

Monocle

DEFINING AFFORDABLE HIGH END
LOUDSPEAKER CABLES

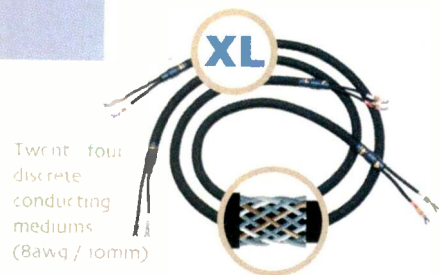


Sixteen
discrete
conducting
mediums
(93awg / 6mm)

WBT Spade Lugs

Twenty years of avant-garde manufacturing and engineering enable KIMBER KABLE to offer the most significant "sane" loudspeaker cables in High End audio.

The Monocle, BiFocal (biwire) and TriFocal (triwire) cables allow signal to flow untouched by external vibration and RF influences. Each model has been engineered and precisely manufactured by KIMBER KABLE to deliver the highest fidelity while maintaining a conservative price.



Twenty four
discrete
conducting
mediums
(8awg / 10mm)

Monocle X - \$580 eight foot pair*
Monocle XL - \$880 eight foot pair*

* Price includes WBT connectors

Visit our web site or contact us for more information and your nearest dealer.

KIMBER KABLE

Revealing the Nature of Music
Since 1979

2752 South 1900 West • Ogden Utah 84401
801-621-5530 • fax 801-627-6980
www.kimber.com

reconstruction), with the remainder being given over to colorful interviews of Barbirolli, Walter, and Stokowski. There's also a fascinating and valuable 1964 documentary, *I Remember Mahler*, by William Malloch, which originally aired on KPFC in Los Angeles. One hears the skillfully edited voices of those—including the composer's daughter, Anna—who knew, heard, or worked as musicians under Mahler. Lasting 106 minutes, the piece offers far more than the half-hour segment on Golden Legacy's *Mahler Plays Mahler* (GLRS-101), a CD that also contains all his 1905 piano roll recordings.

The playing of the Philharmonic is always grandly breathtaking, and the expert transfers from the various sound sources by Seth Winner are nothing short of admirable. The later performances, such as those in stereo (Nos. 2, 3, 5, and 7) are the ones, naturally, that come off best. But barring a few less satisfactory cases, everything here is listenable. Constriction may be heard in such massed passages as Stokowski's No. 8 of 1950, and some occasional graininess might be noticed in the 1962 taping of Solti's No. 4. The retention of audience noises in between movements also helps to communicate the atmosphere and setting of the original broadcasts.

Not least of what makes this New York Philharmonic package so attractive is its inclusion of two superb booklets, each 246 pages. The first, "Mahler in New York," contains an amazing collection of articles, lists of all the Mahler performances by the New York Philharmonic and of the composer's own programs from his seasons directing the orchestra, essays on Mahler and his predecessor, reviews of Mahler's conducting and music, reproductions of his marked scores, a list of the orchestra's management and benefactors, comments by contemporary players of the or-

chestra about their Mahler performances, and features by and about Walter and Bernstein. "The Mahler Broadcasts," the second booklet, contains all the original Philharmonic program notes, reviews of the performances, full texts and translations, biographies of the participants, the membership roster of all those New York Philharmonic players who participated in the broadcasts, and producer Sedgwick Clark's astute appraisal of all that one hears in this extraordinary set. The booklets are copiously illustrated, beautifully printed, and in many cases include color, such as those pages taken from annotated musical scores.

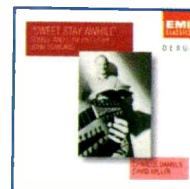
Altogether, this is an absolutely stunning production and deserves the greatest praise. (For phone orders, call 800/557-8268; the Web site is: www.newyorkphilharmoni.org.)

Igor Kipnis

Sweet Stay Awhile: Songs and Lute Pieces by John Dowland

Charles Daniels, tenor; David Miller, lute
EMI CLASSICS CDZ 72266 22, 63:49

John Dowland (1563-1626) composed some 80 songs with lute accompaniment. Though these are often transcribed for classical guitar or even piano, their delicate beauty is best displayed on their original instrument. David Miller shows what a lute can do in skillful hands, and baroque expert Charles Daniels' clear, penetrating tones perfectly match Dowland's succinct masterpieces. From the quiet charm of "I Saw My Lady Weepe" to the strange chromatic harmonies of "Thou Mightie God, That Rightest Every Wrong," the duo interprets the music with deftness and sensitivity. *Patrick Kavanaugh*



L.A.G.Q.

Los Angeles Guitar Quartet
SONY CLASSICAL SK 60274, 60:43
Sound: A-, Performance: B

Not content to simply play guitar transcriptions of classical masterworks, the Los Angeles Guitar Quartet, like the Kronos Quartet—the string quartet that has revolutionized classical presentation and repertoire—looks to contemporary music and global cultures for its material. On this album, that means willful eclecticism. There are suites of African pieces, South American melodies, and klezmer tunes. The quartet plays jazz pianist Chick Corea's Rodrigo-inspired "Spain," a piece by



classical composer Peter Maxwell Davies, and music for Japanese shakuhachi. The Los Angeles Guitar Quartet puts staples on its guitar strings to imitate the African mbira and uses paper clips and foil to help make the instruments resonate like a Balinese gamelan. Though it does sound fascinating and is all beautifully played and recorded, I wish the group had dug in a little deeper. The South American panpipe tunes, in particular, are facile. This quartet is best heard on the African cross-picking of "Djembe," L.A.G.Q. guitarist Andrew York's "Passage," and Dusan Bogdanovic's poignant "Mysterious Habitats," played by John Dearman. *John Diliberto*

JAZZ & BLUES

r e c o r d i n g s

hank mobley



er, nearly masked his abundant creativity. Amid the excitement of early 1950s hard bop, Mobley was a busy sideman with Max Roach, Dizzy Gillespie, Horace Silver, Kenny Dorham, and Julius Watkins.

Nine original albums, including two never before released and four titles that had never been reissued in the United States, are represented on *The Complete Blue Note Hank Mobley Fifties Sessions*. Eight rambunctious quartet tracks open the proceedings, an appropriate introduction to the fine talent heard on these six discs. The next five tunes showcase an unusual front line of tenor plus two trumpeters, Donald Byrd and Lee Morgan. Vibraphonist Milt Jackson is showcased on the next five bluesy jaunts.

By March 1957, Mobley was exploring the typical bop quintet setting, featuring trumpeter Art Farmer. Septets follow, enlisting stylized altoists John Jenkins and Shafi Hadi and trumpeters Byrd and Bill Hardman. The remaining sessions are quintets, with influential trumpeters Dorham, Farmer, and Morgan.

Photo: Francis Wolff. ©Mosaic Images

The Complete Blue Note Hank Mobley Fifties Sessions

MOSAIC RECORDS 181, six CDs, 6:41:53
Sound: A, Performance: A

When Hank Mobley stepped into Rudy Van Gelder's recording studio in March 1955 to record his first sides as a leader for Blue Note, he already had differentiated himself from the pack. Unlike the style of tenor titans Sonny Rollins, John Coltrane, and many others, Mobley's was not as overtly aggressive. He took a less dramatic approach—more

conversational, with a beautiful, lilting sound and a spinning lyricism rather than sheets of sound. His easy manner of delivery, howev-



HERBIE HANCOCK

Gershwin's World
VERVE 314 557 797, 67:25
Sound: A, Performance: B+

In his ongoing mission as jazz's Everyman, whether funk fire-starter with the re-formed Headhunters or urbane interpreter on his own or other artists' albums, Herbie Hancock is always reinventing himself and the music he plays. On *Gershwin's World*, he integrates 14 Gershwin classics into something like a Broadway show album. The cast is impressive, the choice of tunes exemplary. However, the performances more often resemble a set of smoking one-offs than a unified master suite. "Cotton Tail" is a tempestuous jazz improvisation, earth-scorched clean by

drummer Terri Lyne Carrington and saxophonist Wayne Shorter (who is in exceptional form throughout). Joni Mitchell's smoky, knowing renditions of "Summertime" and "The Man I Love" are sublime, as is the Chick Corea/Hancock stride workout, "Blueberry Rhyme."



From the down-home surreal splendor of "Here Comes de Honey Man" and "St. Louis Blues" (with Stevie Wonder on vocals and harmonica) to the fully symphonic "Lullaby" and a beautiful experimental version of Prelude in C-Sharp Minor (with Kathleen Battle and percussionist Cyro Baptista), *Gershwin's World* aims high. That its pleasures are in the individual slices—not in the whole pie—doesn't spoil the taste treat. *Ken Micallef*

**The Right Gear,
Right Here,
Right NOW!**

Get the New Year in
GEAR
Call now for our **FREE** 132 page catalog!

ATOMIC DAWG!
\$89.99

700.4542

CD Recorders
from **\$599.99**

Welcome to the sound, lighting and recording gear revolution! Imagine



the hottest gear on the planet being just a **FREE** phone call away. Call today and start

enjoying the best selection and lowest prices on the gear you need most! Better yet, American Gear will back your purchase with outstanding **FREE** technical support and the

lowest prices in America. In fact, we'll guarantee it's the best price you can find for up to 30 days after your purchase. Look inside our new 132 page **FREE** full color catalog for "Green Tag" and

"American Value" savings on popular models. In addition, every purchase is another entry into our "Gear Group" drawings for **FREE** gear!

price you can find for up to 30 days after your purchase. Look inside our new 132 page **FREE** full color catalog for "Green Tag" and

"American Value" savings on popular models. In addition, every purchase is another entry into our "Gear Group" drawings for **FREE** gear!

"Gear Group" drawings for **FREE** gear!

Call now to join the American Gear Revolution!



Call us toll-free at:
1-800-700-4542

or visit us on-line @ www.american-gear.com

Or, if you find yourself in the LBC, drop by our warehouse direct showroom at 4321 Atlantic Ave., Long Beach, CA 90807

Subwoofers
too low to list! **CALL!**

31-band EQs
from **\$299.99**



Mobley's all-star rhythm sections epitomize the era's musical wealth. They include pianists Horace Silver, Sonny Clark, and Wynton Kelly; bassists Doug Watkins, Wilbur Ware, and Paul Chambers; and drummers Art Blakey, Philly Joe Jones, and Art Taylor.

I can't stress enough how creative Mobley was and how fluent his compositions were; 40 of the 56 tracks here (including many alternates) are his. His arrangements are polished and first-rate, and most of the performances can easily be described as jubilant, imaginative, and spontaneous.

Although Mobley was underappreciated in his lifetime (see the annual jazz polls), he and his various ensembles are now lauded for being at the apex of 1950s hard bop, the era that continues to form the basis of today's straight-ahead jazz. And Mosaic's outstanding, well-annotated overview of these recordings should help burnish Mobley's legacy. (Available direct from Mosaic Records, 35 Melrose Place, Stamford, Conn. 06902; phone, 203/327-7111; fax, 203/323-3526; mosrec@ix.netcom.com.) *James Rozzi*

Wander This World

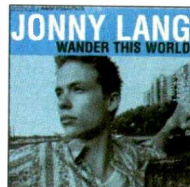
Jonny Lang

A&M VLT 31454-0984, 52:55

Sound: A, Performance: B

Perhaps this album should've been called *I'm a Big Boy Now*, or *Mannish Boy*, or even *Heere's Jonny*. But let's not dwell on the trivial. Jonny Lang, who's still being hailed as a hotshot blues prodigy, shows the spark of a mature and authentic blues player on *Wander This World*, his second major-label album.

Lang's talent is undeniable. And on this latest effort, he bends guitar strings with forceful authority and sings with the elocution and soulfulness of a Stax/Volt legend. True, *Wander This World* is a slick and contemporary, almost watered-down '90s take on the blues—a blend of R&B, soul, and classic rock. Nonetheless, Lang reveals a bluesman's heart and soul (even if his biggest worry in life is finding a prom date). Listen closely to "Angel of Mercy," a traditional 12-bar blues, which awakens his talent like nothing else. *Mike Bieber*



Quality Time

Bob Mintzer Quartet

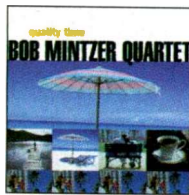
TVT JAZZ 3230, 59:52

Sound: A-, Performance: B+

As the sole horn player for the popular Yellowjackets quartet, saxophonist Bob Mintzer has, by any jazz standards, a high-profile gig. Although he may not get quite the same atten-

tion when his own quartet blows into town, the music on *Quality Time* is essentially from the same groove bag. Mintzer mines a vein of very catchy, very earthy tunes, most of which have enough depth to appease the hard-core, hard-bop fan.

It's obvious that jazz means more to Mintzer than a walking bass line with high-hat. In the opening title track, he juxtaposes unlikely elements, as a funk groove propels a medium waltz. The finger-popping results are catchy indeed. And in Mintzer's vision, funk does not require electronics. Rather, his rhythm section is stacked with strictly acoustic musicians: bassist Jay Anderson, pianist Phil Markowitz, and drummer Peter Erskine—extremely fine, very funky players in their own right.



That's just one side of the coin, however. By the sixth track, "Bop Boy," Mintzer is playing serious saxophone on more traditional blues. "Bop Boy" itself is an uptempo piece. Its opening statement is a blistering duet of tenor saxophone and drums, and then the piano and bass enter while Mintzer navigates the basic changes in sophisticated fashion. It's interesting to hear what the *crème de la crème* is doing with the most basic chordal structures these days.

Creativity abounds on *Quality Time*. And as long as players like these continue to congregate, jazz will move into the next decade with ample representation and options to spare. *James Rozzi*

Trio Fascination, Edition One

Joe Lovano

BLUE NOTE 7243 8 33114, 66:02

Sound: B, Performance: A

As a media-friendly star who's not in his 20s, Joe Lovano is a rarity in jazz. Though he commands his saxophones with all the passion of youth, it is the experience and wisdom of his 48 years that have made him one of the most acclaimed musicians in contemporary jazz. From the experimental groups of Bill Frisell and Paul Motian to the romantic inventions of his own *Celebrating Sinatra*, Lovano's grasp of modern music is masterful. *Trio Fascination* finds him improvising with two of the genre's deepest intellects, drummer Elvin Jones and bassist Dave Holland. In these luxurious surroundings Lovano excels. "4 on the Floor" recalls a classic Impulse blowing session, "Ghost of a Chance" is a breathy, Coleman Hawkinsish rumination on lost love, and "Studio Rivbea" is a hipster's



T A J M A H A L

**In Progress & In Motion,
1965-1998**

COLUMBIA/LEGACY C3K 64919

Three CDs, 3:20:14

Sound: B+, Performance: A to B

Taj Mahal's life's work is a celebration of African-American roots music, from



country and "big city" electric blues to folk, country blues, and (particularly later in his career) other pan-African music (such as calypso and reggae). Even Appalachian music hasn't been overlooked by Mahal, whose toolbox is filled with banjo and various other instruments of rural America.

In Progress & In Motion, a three-disc retrospective from Legacy, nicely surveys Mahal's 30+-year career. Particularly notable are the unreleased recordings from a 1969 record company convention during which Mahal performed with the nascent Pointer Sisters. My only complaint: Disc three leans too heavily on West Indian-inspired material, with keyboards and steel drums straight out of a tourism commercial.

Mike Bieber

swinging ode to bop freedom. On each of these 10 tracks, Lovano tells a new tale with the storyteller's charm and the great improviser's gift for detail.

Ken Micallef

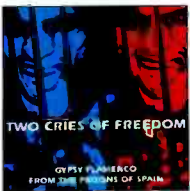
Dos Gritas de Libertad (Two Cries of Freedom)

José Serrano and Antonio "El Agujetas"

ROIR WORLD RUSCD 8246, 59:40

Sound: A, Performance: A

Flamenco has a great deal in common with the blues, not so much tonally or textually as spiritually. Each started as the acoustic expressions of passion and pain by an underclass,



African-Americans and Gypsies. Members of these oppressed minorities frequently receive longer prison sentences than their countrymen.

In Spain, the government joined with national flamenco clubs to sponsor a contest for the best inmate singers, holding out the promise of a reduced sentence and 5,000 pesetas for the winner. José Serrano and Antonio "El Agujetas" won, and this CD shows why.

The two men's styles are vastly different. "El Agujetas," of the Agujetas flamenco dynasty, has a subdued, ineffably sad quality that even permeates his "Seguiriyas." Serrano, meanwhile, has a big, bold, aggressive style that attacks the opening "Bulerías" and practically boils over his "Alegrías."

More than able accompaniment from guitarists Miguel Ochando and Rafael Trenas propel the album. Be warned, however: If your

idea of hard-core flamenco is The Gipsy Kings, you could be in for a shock. Though pristinely recorded, this music is hard and raw, dripping with the grit and emotion of years of incarceration. In other words, it's very strong stuff.

Hank Bordowitz

Like Minds

Gary Burton with Chick Corea, Pat Metheny,

Roy Haynes, and Dave Holland

CONCORD 98018, 68:23

Sound: B, Performance: C

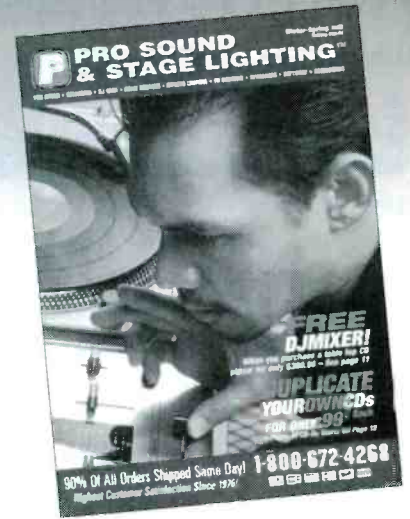
Big guns banding together to record each other's material is nothing new in jazz. This disc, however, documents the first meeting between Pat Metheny and Chick Corea, two of our most prolific and profound improvisers and composers, with Gary Burton, as always, lending a refined sleekness. Cosmopolitan settings, though, are not always an incentive for great jazz. Sometimes you need dangerous electricity to make the fire catch.

The 10 tracks on *Like Minds* are executed with sumptuous musicality and swinging detail, and the front line is heroic. But somehow the spark never fully ignites. Burton's title track is one exception, perhaps owing to its knotty melody and Roy Haynes's acerbic drumming. Corea's sprightly "Straight Up and Down" is another winner. On the other hand, Metheny's "For a Thousand Years" sounded better on Marc Johnson's *The Sound of Summer Running*, and Stan Getz's 1967 *Sweet Rain* album reveals more clearly the dusky dynamics of Corea's "Windows."

Like Minds—maybe, but they're hardly all on the same wavelength.

Ken Micallef

FREE DJ & PRO AUDIO CATALOG!



The #1 Choice of DJs Since 1976!

The Pro Sound & Stage Lighting catalog is jam packed with all the hottest products. Huge selection of pro audio, DJ gear, recording, keyboards, groove gear, software, lighting effects, books & videos, cases, cables, hard-to-find accessories, mics and much more!

- ◆ Compare Thousands Of Top Name Brand Products Side-By-Side!
- ◆ 45-Day Price Protection!
- ◆ 45-Day Trial Exchange!
- ◆ 90% Of All Orders Shipped Same Day!
- ◆ 132 Page Color Catalog!

Top Name Brands at Warehouse Direct Prices!



CALL TODAY FOR YOUR FREE COPY!

1-800-672-4268

Outside the U.S.A. 1-714-891-5914

Mon. - Fri. - 6am - 10pm
Sat. & Sun. 8am - 5pm (PST)

Online Catalog - www.pssl.com
Fax Toll Free 1-888-PSSL-FAX (777-5329)



PRO SOUND & STAGE LIGHTING™

11711 Monarch St., Garden Grove, CA 92841
Since 1976

DVD REVIEWS

DARK CITY

Dark City 1997; R rating; two-sided (one side 2.35:1 aspect ratio, the other pan-and-scan); English and French Dolby Digital 5.1; English and French subtitles; closed-captioned; includes trailer, commentaries, and set designs. NEW LINE N4657, 96 minutes, \$24.98

Picture: A, Sound: A, Content: A

Dark City is a highly stylized sci-fi fantasy in which an alien race, the Strangers, stops the clocks at midnight in Dark City and then programs the citizens' minds through a process called tuning.

The film begins with our hero, John Murdoch (Rufus Sewell), waking up naked in a bathtub and suddenly facing accusations that he's behind a string of serial murders he cannot remember committing. Although none of the other characters can remember anything except vague sensations, Murdoch's tuning has not completely taken: He struggles to overcome the power of the Strangers and destroy their hold on his town.

This is all brilliantly portrayed by actors who intentionally seem a little wooden and two-dimensional. The only character fully fleshed out is the mysterious Dr. Schreber, expertly played in Peter Lorre mode by Kiefer Sutherland, who is aiding the Strangers in their experiments. The sets are reminiscent of Fritz Lang's *Metropolis*, with the humans living above ground in a claustrophobic clutter of skyscrapers that shut out all natural light while the Strangers reside underground in a fantastic, cavernous workshop, replete with intricate machinery and gadgets. It's as if German Expression-

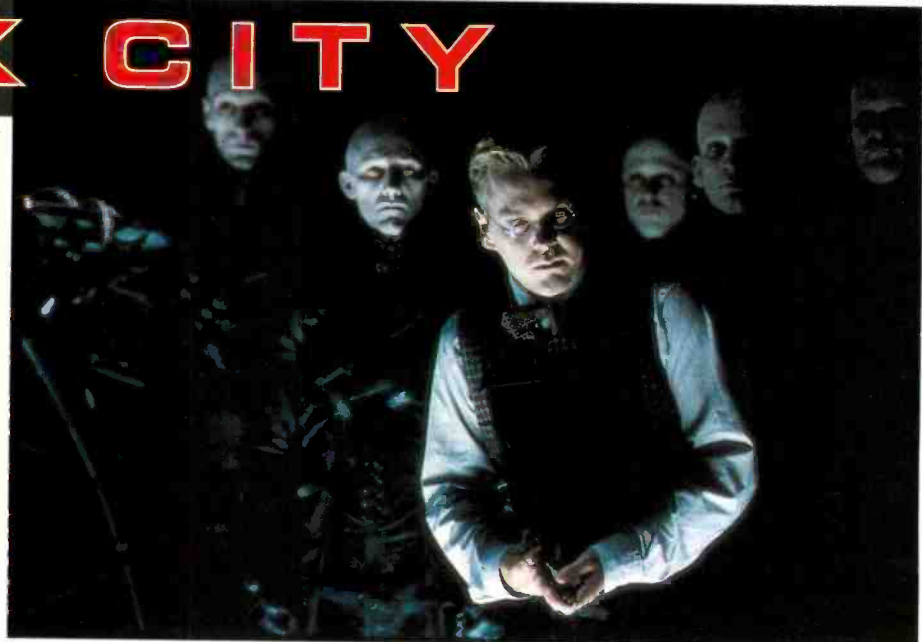


Photo: Justin Boland/New Line Cinema (Courtesy Kobal)

ism had survived to incorporate the wonder of color film and widescreen Panavision.

Dark City isn't for everyone. Those wanting easy answers and familiar surroundings may be uncomfortable. But perhaps that's the point. Those able to suspend belief and simply revel in the eye-popping visuals may

The soundtrack is likewise astounding, perhaps the very best sound mix I've heard on DVD so far. Trevor Jones's pulsing score, which at times reminds me of Shostakovich on drugs, is as well recorded as most classical music selections out these days; the sound-effects mix is also masterful. Full use



BANANAS IS MY BUSINESS

Carmen Miranda: Bananas Is My Business 1994; no rating; one-sided (1.33:1 aspect ratio); color and black-and-white; Dolby Digital two-channel stereo/mono; includes trailer. FOX LORBER FLV5025, 90 minutes, \$29.98
Picture: A-, Sound: B+, Content: A-

Blending rare historic footage, recent and old interviews, and still photos with reenactment footage, director/producer/narrator Helena Solberg has created a mesmerizing biography of Carmen Miranda, one of Hollywood's most misunderstood stars. Miranda was first praised for being selected to go to America as a South American star, then jeered on her return to her homeland, Brazil, for being too "Americanized." Back in America, the Hollywood star system eventually relegated Miranda to playing

a caricature of herself: She was the singer who wore funny hats laden with fruit and spoke a self-invented lingo that often sounded like gibberish but still got the point across. Though this documentary has lots of entertaining scenes of her sizzling performances, one comes away from it feeling for an artist of depth and



emotion who was not allowed to display her full range of talent or her diversity.

The clips all look quite good. The video and audio have been matched so superbly that there are no jarring edges as the film clips go from the 1940s to the 1990s. This is highly entertaining family fare.

R.B.

Receivers

TEAC



TEAC AG-D9100
Audio/Video Receiver
•130w x 2 or 100w x 5 •Dolby Digital built-in •Dolby Pro Logic Surround Sound •Dolby 3 Stereo •30-AM/30-FM presets •Remote
\$299⁹⁹ (TEA AGD9100)

TEAC AG-360
•50 watts/channel, 24-AM/FM station presets, LCD display**\$99⁹⁹**

Sony STR-DE310
•100 watts/channel, 30-AM/30-FM presets, A/V remote control**\$159⁹⁹**

JVC RX-664VBK
•A/V, 100w x 2 or 100w x 4, Dolby Pro Logic, Digital Acoustics Processor, A/V remote**\$179⁹⁹**

Yamaha R-V902
•5-Ch. A/V, 90 watts x 3 + 35 watts x 2, low-impedance drive, Cinema DSP, remote**\$299⁹⁹**

J&R MUSIC WORLD®

Order 24 Hours A Day, 7 Days A Week

1-800-221-8180

www.jandr.com

AOL Keyword: J&R

HIGHLY RATED D/A CONVERTERS- Improve Your CD Sound!



Entech™ Number Cruncher 203.2

High Performance Digital-to-Analog Converter

•Crystal Semiconductor® CS4329 delta-sigma DAC with 20-bit res.
•Coaxial or Toslink digital interface •3 pole analog anti-aliasing filter

\$299⁰⁰ (ENH NC2032)

Entech™ Number Cruncher 205.2 •Superior Performance D/A Converter, 5 pole analog anti-aliasing filter**\$449.00** (ENH NC2052)

For The Audiophile



PLATEAU
AN AUDIOPHILE RACK THAT GROWS WITH YOUR NEEDS. CALL FOR VARIOUS OPTIONS

Plateau MXA5 Modular Audio Rack

•5 shelves •8" between shelves
•23" wide x 20.5" deep x 38.5" high •Additional shelves available •Black

\$199⁹⁹ (PLA MXA5)

Harman Kardon PA5800

•5-Channel Home Theater Power Amp, 80 watts x 5, high-current Mfr. Sug. Retail **\$999****\$399⁹⁹**

Harman Kardon PT2500

•Home Theater A/V Tuner-Controller, 30-AM/FM, presets Mfr. Sug. Retail **\$479****\$199⁹⁹**

Perreaux 350

•Power Amp, 350 watts/ch., high-current (600 watts/ch. @ 4Ω), RCA/balanced inputs**CALL**

Dynaco SCA-210R

•Integrated Amp, 105 watts/channel, remote control**\$399⁹⁹**

CD Players/Changers

Dynaco



Dynaco CDV-PRO
HDCD Vacuum Tube CD Player
•Plays standard & high-definition CDs •Dual 20-bit Burr-Brown D/A converters
•20-track programming •Remote
\$799⁹⁹ (DYO CDVPRO)

TEAC CD-P1120
•16-track programming, 3-way repeat, headphone jack with volume control, remote**\$84⁹⁹**

Philips CDC73517
•5-disc changer, change 2 discs without interrupting play, auto search, remote**\$99⁹⁹**

Technics SL-PG480A
•20-track programming, MASH 1-bit DAC, advanced digital servo system, remote**\$129⁹⁹**

Technics SL-MC6
•110 Disc + 1 Changer, 14-preset musical genre group play, 32-track programming, remote**\$199⁹⁹**

DVD Players

SONY



Sony DVP-S500D
DVD Player
•Plays DVDs, audio & video CDs •Built-in Dolby Digital (AC-3) decoder •Digital Cinema Sound™ processing •Remote
CALL (SON DVPS500D)

Samsung DVD907
•Built-in Dolby Digital decoder, optical & coaxial digital audio output terminals, remote**\$349⁹⁹**

JVC XV-501
•Component/S/composite video outputs, optical digital output for PCM/Dolby Digital & DTS**CALL**

Panasonic DVD-A110
•Coaxial/optical digital audio out, virtual surround sound, remote**CALL**

Panasonic DVD-A310
•Built-in advanced Dolby Digital 5.1 ch. surround decoder, virtual surround sound, remote**CALL**

Cassette Decks

JVC



JVC TD-W718BK
Dual Auto-Reverse Cassette Deck
•Dual auto-rev. record & play
•Dolby B/C/HX-Pro •Pitch control •2-speed dubbing
\$199⁹⁹ (JVC TDW718)

TEAC W-518R
•Dual Cassette, auto-reverse on deck #1, Dolby B, continuous playback**\$79⁹⁹**

Technics RS-TR373
•Dual auto-reverse, Dolby B/C/HX-Pro, dual 2-motor transports, dual electronic tape counters**\$79⁹⁹**

TEAC W-860R
•Dual deck auto-reverse record & play, deck #1: playback pitch control, Dolby B/C/HX-Pro**\$199⁹⁹**

TEAC AD-500
•CD Player/Cassette Deck Combo, auto-reverse record & play, full-function remote**\$279⁹⁹**

Speakers

JBL



64% OFF Mfr. Sug. Retail

JBL CF100
3-Way Floorstanding Speakers
•10" cast-frame woofer •4" cast-frame midrange •Titanium laminate tweeter •175 watts max. •8Ω •Black woodgrain
Mfr. Sug. Retail **\$559.90**
\$199⁹⁸/pr. (JBL CF100)

Bose® 201 Series IV
•Bookshelf, Direct/Reflecting™, 6" woofer, 120 watts max., black or rosewood color**\$198⁰⁰**

TDL Nucleus 2
•Near Field Bookshelf Monitors, 2-way, 5 1/4" woofer, 15-60 watts, black ash**\$299⁹⁹**

JBL 4312 Mfr. Sug. Retail **\$900.00** pr.
•3-Way Control Monitors, 12" die-cast woofer, 100 watts RMS, black**\$499⁹⁹**

Bose® Acoustimass® 5 Series III
•Acoustimass™ bass module + 2 next generation cube speaker arrays, black or arctic white**\$599⁰⁰**

Home Theater Speakers

Klipsch



50% OFF Mfr. Sug. Retail

Klipsch KSW 300™
Powered Subwoofer
•300 watt amp •15" driver
•Continuously variable low pass 40-120Hz; switchable high pass 40 or 80Hz •Black
Mfr. Sug. Retail **\$1000.00**
\$499⁹⁹ (KLP KSW300)

Technics SB-C80A
•Center Channel Speaker, 2-way, 3-speaker design, dual woofers, shielded**\$42⁹⁹**

Yamaha NS-AP150
•Center Channel/Surround Speakers, center speaker has 2 woofers, 2-surround speakers**\$129⁹⁹**

Cerwin-Vega HT-CTR25
•Center Ch., two 5.25" midwoofers & 1" tweeter, 150 watts max., shielded, black**\$149⁹⁹**

Bose® VC5-10™
•Center Ch., 2 drivers in wide dispersion array + 2 drivers in 2-chamber enclosure, shielded**\$199⁰⁰**

Digital Recorders

PHILIPS



Philips CDR880
Reference Standard CD Recorder
•Records audio CDs from various digital & analog sources
•Uses CD-recordable & CD-rewritable discs •20-track programming •Remote
\$599⁹⁹ (PHI CDR880)

Sony MDS-JE520
•MiniDisc Recorder, 20-bit analog-to-digital converter, jog dial, remote**CALL**

Sony MDS-JB920
•MiniDisc Recorder, CD text & Custom File™ transfer, punch control, remote**CALL**

Sony MDBUNDLE4
•Home MiniDisc Recorder + portable player includes 2 blank discs**\$329⁹⁹**

Philips CDR760
•CD Recorder, uses CD-recordable & CD-rewritable discs, 30-track programming, remote**\$499⁹⁹**

Hi-Fi Stereo VCRs

JVC



JVC HR-A54
Hi-Fi Stereo VHS VCR
•4 heads •Pro-cision 19 micron heads •VCR Plus+ •Express programming •Auto SP-EP timer recording •Remote
\$159⁹⁹ (JVC HRAS4)

Samsung VR8608
•4 heads, high-speed fast forward/rewind, universal remote with shuttle**\$139⁹⁹**

Panasonic PV-8451
•4 heads, VCR Plus+, auto clock set, TV/cable/DSS universal remote**\$169⁹⁹**

Sony SLV-678HF
•4 heads, digital auto tracking, Adaptive Picture Control II, multi-brand remote**\$179⁹⁹**

JVC HR-S3500U
•SVHS, 4 heads, Spatializer™ Audio Processing, VCR Plus+ with cable box control, remote**\$299⁹⁹**

Mini Systems

BOSE



Free \$1999.00
SAVE \$300.00
till 4/4/99

Bose® Lifestyle® 12
Home Theatre Music System
•5 small cube speaker arrays & Acoustimass™ bass module
•40w x 5 ch. + 80w for bass
•CD player •AM/FM •Remote
•Black or white
\$1699⁰⁰ (BOS LS12-BK) (BOS LS12-WH)

Panasonic SC-AK15
•30 watts/ch, 3-D space EQ, 5-CD changer, dual auto-rev. cassette, 24 AM/FM presets**\$199⁹⁹**

Aiwa XR-M75
•Ultra-Mini System, 16-watts/ch. CD player, 32-AM/FM presets, remote**\$249⁹⁹**

JVC F3000
•35 watts/ch., CD player, 40-AM/FM presets, dual auto-rev. cass. Mfr. Sug. Retail **\$1000****\$499⁹⁹**

Aiwa NSX-MT960
•Mini Theater™ Audio System, 145w x 2 + 33w x 3, 5-disc CD, dual auto-rev. cass., AM/FM**\$499⁹⁹**

A/V Add-Ons

Technics



Technics SH-AC500D
Digital Sound Processor
•Dolby Digital (AC-3)/Digital Theater System digital decoders
•2-optical/2-coaxial inputs •Remote
\$299⁹⁹ (TEC SHAC500D)

Dynaco QD-1
•5-Ch. Home Theater System Adapter, converts your 2-channel stereo into 5 channels**\$199⁹⁹**

Terk AM-1000
•Indoor AM Antenna, Passive, Pin-Dot™ Pre-Tuning dial of precise frequency**\$49⁹⁹**

Sony RM-AV2000
•Universal Remote Control, works up to 12 components, pre-programmed**\$149⁹⁹**

JVC JX-S700
•Remote Audio/Video Switcher, 7-inputs/4-outputs/1-monitor out**\$449⁹⁹**

Classical



Beethoven Violin Concerto
Itzhak Perlman, Carlo Maria Giulini
\$9⁹⁹ CD

Brahms: German Requiem, Klemperer
ANG 66955**\$9.99**

Fauré: Requiem, Cluytens
ANG 66946**\$9.99**

Beethoven: Symphony No. 9, Furtwangler
ANG 66953**\$9.99**

R. Strauss: Four Last Songs, Schwartzkopf
ANG 66960**\$9.99**

Villa-Lobos: Bachianas Brasileiras, de los Angeles
ANG 66964**\$9.99**

Mahler: Symphony No. 5, Barbirolli
ANG 66962**\$9.99**

CALL TO ORDER. MUSIC REVIEWED IN THIS ISSUE!

CALL US TOLL FREE FOR ITEMS NOT LISTED IN THIS AD

SE HABLA ESPAÑOL

SEND MONEY ORDER, CERTIFIED OR CASHIER'S CHECK, MASTERCARD, VISA, AMERICAN EXPRESS or DISCOVER CARD (include Interbank No., expiration date & signature) To: J&R Music World, 59-50 Queens Midtown Expwy, Maspeth, Queens, NY 11378. Personal & business checks must clear our Authorization Center before processing. Shipping, handling & 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; 3% for orders over \$1000 to \$1500; 2% for orders over \$1500 to \$2000; 1% for orders over \$2000. For heavyweight/over-sized items, shipment by air, or to Canada, Hawaii, Alaska, Virgin Islands & Puerto Rico please call for information. DO NOT SEND CASH. Sorry, no C.O.D.'s. NY residents please add sales tax. ORDERS SUBJECT TO VERIFICATION & ACCEPTANCE. NOT RESPONSIBLE FOR TYPOGRAPHICAL OR PICTORIAL ERRORS. ALL MERCHANDISE SHIPPED BRAND NEW, FACTORY FRESH & 100% GUARANTEED. Some quantities may be limited. Copyright 1999 J&R Music World. City of N.Y. Dept. of Consumer Affairs License Nos. 0900310/0900615/0900616/0900617

Order Code AU903



Visit **J&R MUSIC WORLD** at 31 Park Row, NY, NY
Shop By Phone or to order a FREE
CATALOGUE • 24 Hours A Day, 7 Days A Week
1-800-221-8180
www.jandr.com
AOL Keyword: J&R

is made of Dolby 5.1 to completely immerse you in this tainted city's dark underbelly.

Supplements include two excellent screen-specific commentary tracks, one with director Proyas and his production crew and the other with film critic Roger Ebert. There are also still-frame sections, which include set designs, comparisons to *Metropolis*, and much more. It all makes for a DVD that fully merits its inclusion in New Line's highly regarded Platinum Series.

Rad Bennett

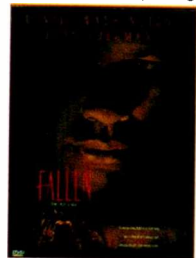
Fallen 1997; R rating; two-sided (one side, 2.35 aspect ratio; the other, full-screen pan-and-scan); English Dolby Digital 5.1; French Dolby Digital two-channel matrix surround; English, French, and Spanish subtitles; closed-captioned; includes theatrical trailers, feature length commentary, and TV spots. WARNER HOME VIDEO 16434, 125 minutes, \$24.98

Picture: A, Sound: A, Content: B+

A demon jumps from body to body via touch, taunting the investigating officer (Denzel Washington) who is trying to catch it before it kills again. In this very slick production, the recurring theme of "Time Is on My Side," sung by the demon through the person it possesses, was an interesting choice, and the twist ending is truly original. Yet it all seems oddly

dispassionate. The characters just never seem quite normal enough for us to really care about what happens to them.

The DVD, though, is still worth seeing and listening to—at least once—for its immaculate



video transfer, absorbing Dolby 5.1 mix, and that surprise ending. In addition, the DVD offers interesting commentary by director Gregory Hoblit, screenwriter Nicholas Kazan, and producer Charles Roven.

R.B.

Suicide Kings 1997; R rating; one-sided, dual-layer (1.85:1 aspect ratio); Dolby Digital 5.1; Spanish subtitles; closed-captioned; includes commentary track, alternate endings, and trailers. ARTISAN 60472, 103 minutes, \$24.98
Picture: A, Sound: A, Content: B+

This nifty cat-and-mouse film noir received almost no theatrical attention but might gain new life with its feature-laden DVD. When the sister of one, and the lover of another, of five college buddies is kidnapped, those rich guys devise a plan to kidnap a mob boss (Christopher Walken) and force him to use his connections to help raise the \$2 million ransom. But nothing is what it seems, and one delicious double-cross after another unravels the plan while revealing the truth. It's clever and intriguing, with Walken obviously relishing his role.

The DVD has alternate endings and, perhaps most interesting for the readers of a magazine devoted to sound, a complete breakdown of one of the pivotal scenes, in which one can hear effects only, music only, dialog only, temp music only, or even several different mixes.

Another supplement allows us, through the use of our players' "Angle" buttons, to alternate between the audience's and the director's points of view, while yet another option offers a storyboard comparison. The bios are interesting, too, with live-action demonstration scenes complementing the printed bios of key players. I give the video transfer an A, and the use of Dolby 5.1 is very skillful.

My only complaint: The layer shift is fairly obvious. Why not do this change on a "fade to black"? No one would be the wiser.

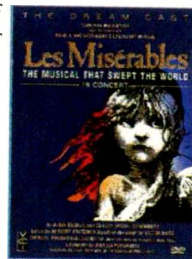
R.B.

Boublil and Schönberg: Les Misérables in Concert 1995; no rating; two-sided (1.33:1 aspect ratio); Dolby Digital two-channel stereo; English subtitles. VCI/COLUMBIA TRISTAR 88709, 147 minutes, \$24.98

Picture: A, Sound: A, Content: A

To commemorate the 10th anniversary of *Les Misérables*, the internationally renowned show, a company of more than 250 performers assembled in the Royal Albert Hall, complete with what looks like the entire Royal Philharmonic Orchestra. The cast was chosen from those who have played the roles on both sides of the Atlantic. (Colm Wilkinson, who appeared in the original London and Broadway productions and on the original London cast recording, portrays Jean Valjean.) The acting and singing maintain a level of virtuosity, precision, and involvement not often encountered in a live production. The principals appear in appropriate costumes and makeup, and there is enough post-production footage included, along with summaries of the plot, to give a sense of the show beyond the concert staging.

The video is quite good. Despite the gargantuan nature of this production, lots of close-ups of the main characters help create a sense of intimacy. Switchable subtitles are provided, but, wonder of wonders, I didn't need them because I could understand every single word; I even comprehended passages for chorus—a remarkable feat. The overall sound is excellent, well balanced, and clean yet still presents a good acoustic image of the large hall. Even the lay-



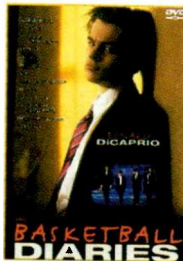
out of the DVD has been carefully accomplished; side 1 contains Act I, while side two holds Act II. More shows and operas done with this care and organization would surely be appreciated on DVD.

R.B.

The Basketball Diaries 1995; R rating; one-sided (1.85:1 aspect ratio); Dolby Digital 5.1; closed-captioned; includes interviews and an anti-drug trailer. PALM PICTURES 800 635 899-2, 102 minutes, \$29.98

Picture: A-, Sound: B+, Content: A-

One of Leonardo DiCaprio's early successes, *The Basketball Diaries* is a gritty film about poet



Jim Carroll's harrowing descent into drug addiction during his teens. Because of its unflinching realism, it's sometimes difficult to watch, but the performances from DiCaprio, Mark Wahlberg, and Bruno Kirby are outstanding. The disc, a very good DVD transfer, includes an anti-drug trailer, television spots, and brief interviews with the cast members and director Scott Kalvert.

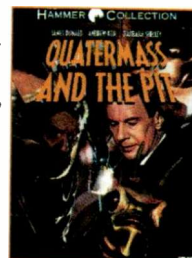
R.B.

Quatermass and the Pit 1967; no rating; two-sided (1.66:1 aspect ratio); Dolby Digital 5.1; includes commentary track, U.S. and U.K. trailers, documentary, and TV spots. ANCHOR BAY DV10505, 98 minutes, \$29.98
Picture: A, Sound: B+, Content: B+

Quatermass and the Pit is the third and last installment of the British film series involving a no-nonsense professor who's also a self-acclaimed astronomy expert. Released in the late '60s in the United States as *Five Million Years to Earth*, this movie, featuring intelligent dialog and good acting, finds Quatermass and friends unraveling the mysterious origins of a spaceship and nearby alien fossil bones discovered by construction workers digging below the streets of London.

This is the first release from Anchor Bay in its Hammer Collection, offerings from the British studio devoted to sci-fi and horror movies. Like other titles in the series, *Quatermass and the Pit* is in its proper (widescreen) aspect ratio, in a print that looks recently minted. There's also a short documentary, which contains scenes from other Hammer sci-fi films, several trailers, and commentary by director Roy Ward Baker and writer Nigel Kneale. While the remixed sound is fine, the original mono track is presented, too, so viewers can choose. Hammer fans—rejoice!

R.B.



BAGS[®]

AUDIO/VIDEO FURNITURE
DESIGN

"We'll even design a piece to your exact specifications!"

▼ #PRO-34 (Twin Towers) Audio Racks

THE NEW #8248 LP Storage Rack

THE NEW #6650 LP Audio Rack

▲ #PRO-1000 Holds 1000 CDs/DVDs

THE NEW #LPDVDCD Storage Rack (Holds it all)

▲ NEW TRI #PRO-6 Audio Rack TRI #PRO-1 AMP Stands

▲ #PRO-44 TV Component Table

▲ #PRO-60 Entertainment Center

NEW Computer Furniture

4147-A Transport St. Ventura, California 93003
805/644-2185
Contact us today for a copy of our detailed newsletter
THE NEW BAGS REPORT #IV
For your local dealer visit
www.billybags.com

NEW SERIES B

MODULAR HARDWOOD CABINET SYSTEM

PROVIDES UNLIMITED STORAGE FOR CDS, DVDS, VIDEOS, LPS, LASERDISCS, CASSETTES & COMPONENTS.

DOESN'T YOUR COLLECTION DESERVE THE BEST? FIND OUT JUST HOW AFFORDABLE TOP QUALITY IS. REQUEST INFO KIT 1 & GET ALL THE FACTS...

CALL: 800-432-8005
FAX: 973-667-8688
E-MAIL: SORICEAV@AOL.COM

SORICÉ
PO BOX 747-1A, NUTLEY, NJ 07110
[HTTP://WWW.SORICE.COM](http://www.sorice.com)

Progressive Structures™

Call today for color literature & Factory direct pricing.
Phone 651.452.7099 Fax 651.452.4519

Jon Alexander™
Furniture Designs, Inc.
2890 Skyline Drive, St. Paul, MN 55121
www.jonalexander.com

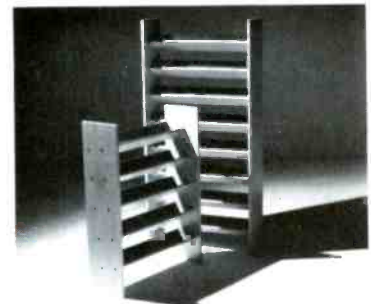
Modular stackable oak units hold all recording formats & components

Tabletop Rail Rack Component Rack Drawers Dolly

America's best disc, tape and component storage system

Free mail-order brochure (please mention Audio)

Per Madsen Design (+15) 822-4883
P.O. Box 882464, San Francisco, CA 94188



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.

The Ultimate STORAGE CABINET

MasterCard VISA

Made in U.S.A.

The Cube
by Lorentz Design

Stores 306 CD's or any combination of CD's, DVD's, CD-ROM, 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 •

to order or for a free, color brochure
Call **800-933-0403**

LDI, Inc. • P.O. Box 277 • Lanesboro, MN 55949
Fax: 507-467-2468 • Or e-mail us your brochure request at lorentz@polaristel.net

Infinite CD capacity

Imagine 270 CDs in one drawer. Then, imagine modular media cabinetry. Now, let your imagination run wild...

Please call to receive a catalog on storage cabinets you can't outgrow.

800-387-9790
Fax: 905-475-1154 www.can-am.ca

CAN - AM

DEALER SHOWCASE

GEORGIA

Audio Research
Mark Levinson
Theta Digital
Pass Labs
Proceed

Revel
Aerial
ProAc
Paradigm
Von Schweikert

Audio Solutions

5576 Chamblee Dunwoody Rd.
Dunwoody, Georgia 30338

(770) 804-8977

<http://www.audiosolutions.com>

VPI
Grado
Sumiko
Graham
Tara Labs
Benz-Micro
Sennheiser
Kimber Kable
Magnum Dynalab

Audible Illusions
Pioneer Elite
Marantz
Lexicon
Aragon
Acurus
Adcom
Belles
SME

ILLINOIS

ELECTRIFY
YOUR LISTENING EXPERIENCE

FOR YOUR FREE CATALOG
CALL 1-800
AUDIO·HI
(1-800-283-4644)

LEGACY
A·U·D·I·O
3021 SANGAMON AVE.
SPRINGFIELD, IL 62702

IOWA

hawkeye audio video

www.hawkeyeaudio.com

Acurus
Arcam
ATI
Audioquest
B & K
Balanced Audio Tech.
Black Diamond Racing
Chang Lightspeed
Clements
Conrad-Johnson
Definitive Technology
Grado
JM Lab
JoLida

Lovan
Marantz
Mitsubishi
Niles
Nordost
Paradigm
Paradigm Ref
Rega
Rogue Audio
Snell
Sumiko
Tara Labs
Vantage Pt
Yamaha

(319) 337-4878

401 S. Gilbert St. Iowa City, IA 52240
6322 University Ave. Cedar Falls, IA 50613

MASSACHUSETTS

The Best Values In Hi End Hi-Fi.

audio studio

Authorized sales and service for:
Audible Illusions, Audioquest, B&K,
Beyerdynamic, Counterpoint, Dual,
Klyne, Maplenoll, Marantz, Mirage,
Mission, Monster Cable, Morel,
NAD, Nakamichi, Oideion Products,
Ortofon, Project, Proton, QUAD,
Renaissance Audio, Revox,
Sennheiser, SME, Shure, Stax,
Straight Wire, Sumiko, Thorens,
Velodyne, VPI, and many more.

414 Harvard St., Brookline, MA 02446
(617) 277-0111

FAX (617) 277-2415

www.gis.net/austudio

INTERNATIONAL BUSINESS ACCEPTED

NEW JERSEY

Avalon Audio Video
Reasonable, High-End Equipment for
Music, Home Theater, Surround Systems
Robert Trollinger, Jr. Medford, New Jersey
Personalized Service & In-Home Setup

Acurus
Angstrom
Aragon
Aragon Palladium
Arcam
B&K
Bryston
Camelot
Chiro & Kinergetics
Cinpro
Da-Lite
Dunlavy
EAD
Electrocompaniet
Genesis
Hales
Harmon-Kardon
Hologram

IEV
Lexicon
Meadowlark
Mirage M Series
M&K
NEAR
Parasound
Plinius
Projectavision (DLP)
Rega
Seleco
Stewart
StraightWire
Sunfire
Tandberg
Target
Toshiba
Tributaries
Velodyne
Vidikron

And More...
Tel: 609-654-7752 www.avalonav.com

NEW YORK

AUDIO VIDEO CREATIONS

"HOOKED ON SONICS"

AMPRO
ANGSTROM
ANTHEM
APOGEE
BASIS
B&K
BELLOGGETTI
CONRAD JOHNSON
DWIN
FAROUDJA
HARMON/KARDON
JBL
KRELL
MARTIN-LOGAN
MAGNUM DYNALAB
MIRAGE

MITSUBISHI
NHT
NILES
ONKYO
PIONEER ELITE
PSB
SONANCE
SONY
SONIC FRONTIERS
STRAIGHTWIRE
STEWART
SUNFIRE
TRANSPARENT
TRIAD
VPI
XLO

AND MORE:

999 NORTHERN BLVD.
MANHASSET, NY 11030

Phone 516-365-4434 • Fax 516-365-6285

TEXAS

AUDIO BY DESIGN

PROUDLY REPRESENTING
THE FOLLOWING MANUFACTURERS!

Acurus
Aerial Acoustics
Alpha-Core
Anthem
Aragon
AudioQuest
Bryston
CAL Audio
CLASSE Audio
Creek
Denon
Enlightened Audio Design
Epos

Jolida
Kimber
Meadowlark
Niles
Paradigm
Rega
Synergistics
Sonic Frontiers
Stand Design
Velodyne
Von Schweikert
VPI
Wharfedale

FACTORY AUTHORIZED
3-DAY FEDEX SHIPPING

(512) 458-1746

911 W. Anderson Ln. #116
Austin, TX 78757

WISCONSIN

ARCHITECTURAL AUDIO
• DAT
• MINIDISC
• WORLD BAND RADIO
• PRO WALKMAN
• CABLES

the Happy Medium
www.HappyMedium.com

FIELD RECORDERS
• DSS
• SONY DST
• CUSTOM INSTALLATION
• HOME THEATER
• ACCESSORIES

• a/d/s/
• AMC
• CARVER
• GRADO
• HARMAN KARDON
• JAMO
• JVC
• KEF
• LEXICON
• MONSTER CABLE
• NAD

• NAKAMICHI
• NILES AUDIO
• ONKYO
• PANAMAX
• PSB SPEAKERS
• SANUS SYSTEMS
• SHERWOOD NEWCASTLE
• SUNFIRE
• SONY ES
• TARGET
• THORENS

430 State Street • Madison, WI 53703 • FAX 1(608) 255-4425
1-800-906 HI-FI (4434)

VIRGINIA

Musicscope Co. Ltd.
The Quality Audio/Video Store
2952 Chainbridge Rd, Oakton, VA 22124
Tel: (703)938-1111
Serving Northern Virginia/DC/MD Area

*Ampro
*Anthem
*Atlantic Technology
*Audio Prism
*Audio Quest
*B&K
*Bryston
*Citation
*Denon
*Faroudja
*Harmon/Kardon
*Luxman
*Marantz

*Nakamichi
*NHT
*Panamax
*Pinnacle
*Pioneer/Elite
*PSB
*QED
*Runco
*Stewart
*Tara labs
*Target
*Theta
and much more...

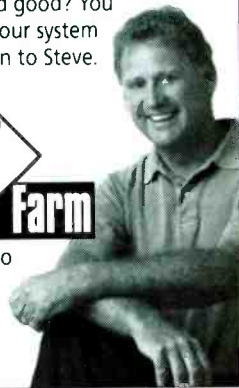
<http://www.musicscope.com>

VIRGINIA

The people with the best sound systems in the world listen to Steve Davis.

Alanto • Audio Note • B&K • Cal Labs • Cordes •
Chiro • DH Labs • Dunlaw • Grado • Joule Electro
• Khroma • Koro • Lamm • Magnum/OCM •
Mejos • Metronome • MIT • Phonus • Quad •
Roksan • Spondor • TAG (Technik, Avant Garde) •
Target • Von Schweikart • VPI • & Others

Why? Because he listens to them. Gets to know them. Learns their musical tastes, their priorities, their budgets. So when Steve makes recommendations, his customers trust his advice. They know they're getting the best equipment for their needs. Sound good? You bet it does. And your system will, too. Just listen to Steve.



New & Used Audio
Since 1978

800-752-4018
540-721-4434
www.hififarm.com

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 advice 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)

FAX 212-767-5624

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

OUR 23RD YEAR! CALL 1(800) 826-0520. ★
ADCOM ★ NAD ★ SONY ES ★ ONKYO ★
CARVER ★ KEF ★ HARMAN KARDON ★
LEXICON ★ NAKAMICHI ★ AMC ★ PSB
SPEAKERS ★ VELODYNE ★ JAMO ★
GRADO LABS ★ AUDIOCONTROL ★ a/d/s/ ★
NILES AUDIO ★ THORENS ★ SANUS SYSTEMS ★
TICE AUDIO ★ INFINITY ★ PAN-AMAX ★
ROCKFORD-FOSGATE ★ TARGET ★
SOUNDSTREAM ★ CELESTION ★ MONSTER
CABLE ★ SOUND SELLER BOX 224,
2808 CAHILL, MARINETTE, WI 54143-0224

SAVE 40% on High End Speakers, Subwoofers, Amps and Processors. Shipped direct to you. FREE CATALOG 800-283-4644.

AUDIOPHILE & SCHOLAR

UNIVERSITY AUDIO SHOP, MADISON, WI
AUDIO RESEARCH, KRELL, ARAGON, MARTIN LOGAN,
THIEL, Acurus, B&K, YBA, Jmlab, Paradigm, Totem, EAD,
CAL, Golden Tube, Tara, Lexicon, Vidikron, Harman Kardon,
Rega. (608) 284-0001.

AUDIO UNLIMITED

From Colorado we offer novice and serious audiophiles an alternative to mass market high end equipment. We represent only musical products that offer the highest performance to dollar value. In keeping with the philosophy, we present a careful selection of components from around the world, if interest to audiophiles who listen to music and appreciate what it adds to the quality of life. Authorized dealer for: ACCUPHASE, Acoustic Energy, Acrotec, Aesthotix, AIR TIGHT, Audio Artistry, AudioCraft, Audio Meca by Pierre Lume, AudioNote, Basis, Benz-Micro, Chang, Chario, CODA, Continuum, Day-Sequerra, Dynavector, Ensemble, Graaf, Graham, Harbeth, High Wire, Kuzma, Magnum Dynalab, Merel, Micro-Seiki, Morch, MUSE, Musical Design, Music Metre, Odeon, Onix, Oracle, Rega, Spondor, Symphonic Line, Systemdek, TANNØY, Transfiguration, VanDenHul, Wheaton, YBA, XLO, Zoethecus, and more....Call, Write or Fax for more information. John Barnes @ Audio Unlimited, 2341 West Yale Ave Englewood, Co, 80110. Phone/Fax 303-691-3407. Visa and Mastercard Accepted.

FOR SALE

AUDIO BY VAN ALSTINE FET-VALVE hybrid tube and Ω mega III active feedback pre-amplifiers, amplifiers, DACs, inverters, more, achieve dynamic liquidity, stunning clarity, rugged durability through precision engineering. Plus economical AVA kit or wired circuits for classic Dynaco and Hafler chasis attain ultimate musical faithfulness. Free illustrated catalog! Audio by Van Alstine, 2202River Hills Drive, Burnsville, MN 55337. (612)890-3517. Fax: (612) 894-3675. info@avahifi.com http://www.avahifi.com/

MERIDIAN EQUIPMENT - ALL 40-50% OFF NEW W/FULL MFRS. WARRANTY, 565, 562V, 518, 504, 586 DVD, 508, 500, 566. SPEAKERS - 5500, 5000, 5000C. ALAN 954-537-3353

FOR SALE

AUDIO CABLES & MORE



**DON'T PAY EXORBITANT PRICES!
! FOR TOP QUALITY!**

We have equaled the high priced brands. Sonic equivalents at a fraction of their cost. We demystify wire technology. Ask for literature.

AND MORE: Audio/Video Components. DDS and other Home Theater Components. Speakers Component stands. Accessories - & **MORE**

Call 800 321 2108 24hrs/day for free catalog

L A T INTERNATIONAL

Dept. A 317 Provincetown Road
Cherry Hill, NJ 08034

MUSICAL CONCEPTS SIGNATURE

Signatures mods have arrived with HyperFast diodes, BlackGate caps. Add HyperFasts and BlackGates to any component! Signature updates available for previous mods! Specialized mods for Adcom, Audio Alchemy, B&K, Dyna (tubes too!) and Hafler! NEW!!! Single-Ended PA-3 frontend board for Hafler amps—unbelievable sound! Signature CD Players are ready! Highly regarded CDT-4 Transport \$795. Marantz, Rotel, Pioneer CD mods. Musical Concepts, 5749 Westwood Dr., St. Charles, MO 63304. 314-447-0040.

Buy-Sell-Trade

All brands of
High End Audio Since 1979
AUDIO CLASSICS

-Limited-

FREE condensed catalog!

8AM-5PM ET Monday-Friday

Phone/Fax

607-766-3501

www.audioclassics.com

3501 Old Vestal Rd.

Vestal, NY 13850

ATTENTION: S.A.E.—G.A.S.—SUMO OWNERS! Original designer is now offering a Modernization Program. Why pay today's megabuck prices? Consider the alternative. **JAMES BONGIORNO: (805) 963-1122.**

SINGERS! REMOVE VOCALS
Unlimited, Low Cost, Instantly Available Background Music from Original Standard Recordings! Does Everything Karaoke does... Better and gives you the Thompson Vocal Eliminator™ Free Brochure & Demo Tape. LT Sound Dept AU-1 7980 LT Parkway, Lithonia, GA 30058 Internet: http://LTSound.com 24 Hour Demo/Info Request Line (770)482-2485 Ext 51 When You Want Something Better Than Karaoke!

SATURDAY AUDIO EXCHANGE— Chicago's source for discontinued, demo, used & new home audio equipment for 16 years. For information call 773-935-U-S-E-D or see our online catalog at <http://saturdayaudio.com>

FOR SALE

FRIENDLY PEOPLE, EXPERT ADVICE, and THE LOWEST PRICES!

HOME THEATER SPECIALISTS

ABC
American Buyer's Club International

www.stereoabc.com
1-800-354-1324

Customer Service: 732-780-6600
Fax Orders: 732-294-7480

130 Highway 33 • Englishtown, NJ 07726

www.abcestereo.com

<p>RECEIVERS</p> <p>YAMAHA RX-V795 AC-3 . . . CALL RX-V2095 . . . dts</p> <p>KENWOOD 2090 VR . . . 799 209 VR . . . 329</p> <p>SONY STR-DE925 . . . 459</p> <p>DENON AVR2700 . . . CALL AVR3200 . . . AC-3 AVR5600dts . . . THX</p> <p>JVC RX884BK . . . TOP RX1024BK . . . RATED</p> <p>SEPARATES</p> <p>TANDBERG TCA-4038 . . . CALL</p> <p>B & K REFERENCE 20 . . . dts</p> <p>ADCOM GTP740 . . . PRE AMP GFA7500 . . . AMP</p>	<p>SPEAKERS</p> <p>ENERGY TAKE 5 . . . CALL RV55 . . . CALL</p> <p>KRIX KDX SYSTEM . . . CALL EQUINOX . . . 599 CENTRIX . . . CALL</p> <p>KLIPSCH KLF20 . . . CALL KLIPSCH 3.1 . . . 299</p> <p>ATLANTIC TECHNOLOGY 450 SYSTEM . . . THX 370 SYSTEM . . . AC-3</p> <p>PSB STRATUS GOLD . . . CALL STRATUS MINI . . . NEW</p> <p>AUDES 025 TOWERS . . . 797 015 BOOKSHELF . . . 349</p> <p>IN-WALL SPEAKERS NILES, RUSSOUND, ADS</p>	<p>DVD PLAYERS</p> <p>JVC XV-501BK . . . dts . . . 399</p> <p>PIONEER DV414 . . . 349</p> <p>SONY DVP-5300 . . . 369</p> <p>PANASONIC DVD-A310 AC-3 . . . 478</p> <p>KENWOOD DV-2070 . . . CALL</p> <p>SUBWOOFERS</p> <p>LOWEST PRICES! VELODYNE . . . FSR-12 M&K . . . MX-125 KLIPSCH . . . KSW-200 ARS12HO . . . 299 PSB SUBSONIC3i . . . CALL</p>	<p>CD PLAYERS</p> <p>DENON DCM460 . . . 339</p> <p>MARANTZ CD675C . . . 369</p> <p>YAMAHA CDC665 . . . 239</p> <p>PHILLIPS CDR765 . . . RECORDER</p> <p>BIG SCREEN</p> <p>HITACHI . . . AUTHORIZED TOSHIBA . . . DEALER SONY . . . CALL MITSUBISHI . . . CALL PHILLIPS . . . PDS4203W</p> <p>JVC PIONEER SONY YAMAHA Velodyne</p>
--	---	--	---

MILLION DOLLAR INVENTORY

5 YEAR WARRANTIES AVAILABLE ON ALL PRODUCTS

All products are new USA merchandise covered by the manufacturers warranty or ABC's exclusive limited warranty.

Custom Installation
FREE In-Home Evaluation

American Theater Systems

AC3 • DTS • DVD • AUDIO • VIDEO

- ACCUSONIC • ADCOM • ADS • AMPRO • AR • APOGEE
- ATLANTIC TECH • ATI • BIC • B&K • B&O • BOSE • BOSTON
- CARVER • CELESTION • CINEPRO • CITATION • DENON
- DWIN • ELITE • ENERGY • FAROUDJA • HITACHI • H/K
- INFINITY • JAMO • JOLIDA • JVC • KEF • KENWOOD •
- KLIPSCH • LEXICON • MARANTZ • MIRAGE • MISSION • M&K
- NAD • NAK • NHT • NILES • ONKYO • PIONEER • RUNCO
- SHARPVISION • SONNANCE • SONY ES • TOSHIBA • TRIAD
- VELODYNE • VMPS • VIDIKRON • YAMAHA • XLO

SPECIALS!!!

SHERWOOD NEWCASTLE	CALL
PLASMA TV NOW AVAILABLE	
200 CD CHANGER	\$169
400 WATT RECEIVER	\$199
DVD PLAYER	\$299
YAMAHA AC3 DEC	\$199
ATI 1504	CALL
ONKYO AM/FM TUNER	\$99
MARANTZ 125 WATT AMP	\$269
MIRAGE SURROUND SPKR.	\$150pr
ROTEL RCD975	\$389
600 WATT/3 CHANNEL AMP	\$599
PRO CD RECORDER WAS \$2600	\$899
SONY FLAT TV	CALL
MIRAGE OM10	\$789pr
B&W 802	\$1899pr
SUNFIRE CINEMA GRAND	

VISIT OUR WEB SITE: WWW.AMSOUND.COM

GUARANTEED LOWEST PRICE ON SYSTEMS
Call Today 1-800-889-5845 And SAVE!!!

FOR TWENTY-FIVE 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 (770) 458-1679. FAX: (770) 458-0276.

HIGH-END COMPONENTS AT DISCOUNT PRICES - AERIAL, B&W, DYNAUDIO, MIRAGE, THIEL, TOTEM, KEF, VON SCHWEIKERT, BRYSTON, CITATION, CLASSE, RESOLUTION AUDIO, SONIC FRONTIERS, KRELL, AND OTHER EXCLUSIVE AUDIO PRODUCTS. HELM MUSIC, INC. (888) 519-9800.

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. If you pay by credit card, you may have a greater recourse in the event the advertiser does not perform. (Check the complaint procedures of your credit card companies). 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 Susan Ross, Special Marketing, 45th floor, Hachette Filipacchi Magazines, 1633 Broadway, NY, NY 10019. Be sure to include copies of all correspondence.

CLASSIFIED
 FOR ADVERTISING INFORMATION
ADVERTISING
 CALL 1-800-445-6066 9AM-5PM EST.

LOUDSPEAKERS



JBL

\$299.99/EA. JBL 3412C(BK), JBL4312C(WAL) \$999/PR CONTROL MONITORS (NEW)! EMPLOYED BY 70% OF RECORDING STUDIOS FOR MIXING/EVALUATION. 12db X-OVER NETWORK, 3-WAY WITH 12" WOOFER, 5" MIDRANGE & DOME TWEETER, 100 WATT CAPACITY. ALSO, NEW JBLST125-COMPRESSION DRIVER & HORN W/15" WOOFER \$299EA.; JBL4425 \$995EA.; JBL4652 12" W/COMPRESSION DRIVER \$769EA.; JBL4655 15" W/COMPRESSION DRIVER \$867EA. PARAGONS \$13,999 DELIVERED; HARTSFIELD 085s \$6,999(REPRO)-\$17,999(ORIG)/PR. OLYMPUS S8-R \$3,999/PR, L300-333 \$2,999/PR. W.E. 300Bs \$350/EA(NEW). CATALOG \$10. SHIPPED WORLD-WIDE (UK-\$297, EUROPE-\$325, JAPAN-\$350), VISA/MC. HAL COX, SINCE 1947. (415) 388-5711. FAX:(415) 389-6097, 164 TAMALPAIS AVE., MILL VALLEY, CA 94941. SAN FRANCISCO AREA.

1-800-NEW-FOAM

Satisfaction Guaranteed or your money back-Worldwide Speaker Repair since 1979

Read about the famous NEWFOAM® D.I.Y. Speaker Repair process in "Stereo Review" June 1996

NEWFOAM® • 3047 West Henrietta Road • Rochester, NY 14623-9531 USA
 voice (716) 424-3680 fax (716) 427-9339 video (716) 427-9277

"New Foam's price was half of what I had paid previously. I recommend the company highly." David Adler, "Audio Magazine" February 1997

"It (NEWFOAM®) looks like a good value and a darn good idea." Dr. Allan Powell, Host "Tech Talk" radio program KAMU-FM Texas A & M University

As seen in the WALL STREET JOURNAL "Business on the Web" January 22, 1998

Phone Toll Free	FAX Toll Free
1-800-NEW-FOAM	1-800-2FX-FOAM
1-800-639-3626	1-800-239-3626

www.NEWFOAM.com

PRO LX-5 UPGRADES: Dramatic improvements to mid-range clarity starting at \$25.00 each, D.I.Y. For Info Send \$3.00 to: Accumill, P.O. Box 1107, Pine Valley, CA. 91962

CUSTOM ACTIVE ELECTRONIC CROSS-OVERS, 6 to 36 dB/Oct. Snell, Magnepan versions. DB SYSTEMS, P.O. B 460, RINDGE, NH 03461. (603) 899-5121. dbsys@rice.edu

GUARANTEED SPOUSAL ACCEPTANCE and REFERENCE SOUND with these loudspeakers or your money back. \$1,580/pair. Free brochure: 888-774-3744. Mfr. direct: SONOCHROME.

PARTS EXPRESS SPEAKER CATALOG

The Parts Express catalog is a must for the serious speaker enthusiast! We are a nationally known electronics distributor that takes pride in our huge selection of products and our first rate customer service. We stock a dizzying array of audio related components including raw loudspeaker drivers for home and car, home theatre products, connectors, wire, test equipment, plus numerous accessories. So what are you waiting for ... call for your FREE 268 page catalog today!

1-800-338-0531

Source Code: AUM

1-800-338-0531

Parts Express®
 725 Pleasant Valley Dr., Springboro, Ohio 45066-1158
 Phone: 513/743-3000 ♦ FAX: 513/743-1677
 E-mail: sales@parts-express.com

LOUDSPEAKERS

'101dB at 12.5 Hz, 110dB at 16 Hz, 114dB at 20 Hz..'

Don Keele, Audio, August 1998

'Bargain of the Century'

Tom Nousaine, CSR, May 1998

'An Absolute Must Buy'

R. Thompson, Sensible Sound, #67

HSU RESEARCH

True Subwoofers

Offer:

- Unparalleled Value
- Unparalleled Flexibility
- Unique User Support
- Smallest footprint of any subwoofer
- Garnered more rave reviews than anyone

Website: www.hsuresearch.com

Email: hsures@earthlink.net

Hsu Research, Inc.

3160 E. La Palma Ave. #D

Anaheim, CA 92806

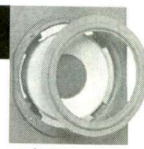
(800)554-0150/(714)666-9260

(714)666-9261 (FAX)

Available through select dealers, or factory-direct with 30-Day money-back guarantee

REPAIR FOAM ROT YOURSELF!

- Save \$\$\$ with original kit!
- Kits to fit any speaker—Advent, AR, JBL, Bose, Infinity, EV, etc.
- Surrounds, adhesive & instructions
- MC/VISA/Discover/AMEX—no CODs
- Call with make & model for best price
- Phone 24 hrs. **828-697-9001**
- or Toll Free **800-747-3692**



STEPP
AUDIO TECHNOLOGIES

SPEAKER FOAM REPLACEMENT KITS. REPAIR YOURSELF! All Sizes. One Low Price. \$14.95pp. Concert Works, Box 265190, Daytona Beach, FL 32126. Visa/MC 904-253-5695. Satisfaction Guaranteed.

WANTED TO BUY

WANTED: TUBE HI FI, CORNER/HORN SPEAKERS! Altec, Jensen, Marantz, Leak, Quad, McIntosh, Western Electric, EV, JBL, Tannoy ETC. Sonny (405)737-3312. Fax 3355.

CASH for USED AUDIO & HOME THEATER 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. WEB SITE Catalog: www.tsto.com

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.,** 3501 Old Vestal Rd., Vestal, NY 13850. Phone: 607-766-3501 8am-5pm EST Mon-Fri.

FOR BEST PRICES PLEASE CALL DAVID YO: I'd buy tube type Marantz, McIntosh, Western Electric equipments. Old speakers, units, from Tannoy, Altec, JBL, Jensen, EV, W.E., POB 80371 San Marino, Ca. 91118-8371 Tel: 626/441-3942

CABLE TV

CABLE DESCRAMBLER KIT. Only \$14.95! See all premium & pay-per-view channels. Why pay hundreds more? For more information: 1-800-752-1389.

CABLE TV DESCRAMBLERS/CONVERTERS: "ABSOLUTELY" THE BEST PRICES! WHOLESALERS WELCOME! FREE CATALOG. START YOUR OWN BUSINESS. DETAILS: 1-800-827-1115 OR www.sestv.com

CABLE DESCRAMBLERS. 30-day trial, 1-year warranty. Lowest prices guaranteed! Dealers welcome. Boss units \$110.00. Ten packs. C.O.D. only. 1-888-762-2253.

ALL CABLE TV CONVERTERS & ACCESSORIES. WE'LL BEAT ANY PRICE. 30 DAY TRIAL 1 YEAR WARRANTY. QUALITY EQUIPMENT. DEALERS WELCOME. 1-800-538-CABLE(2225)

CABLE T.V. CONVERTERS, TEST CHIPS & EXTERNAL ACTIVATORS. ALL MAJOR BRANDS. DEALER PRICING. #1 IN TECHNICAL SUPPORT. CALL WOLVERINE ELECTRONICS: 1-800-743-5350.

PARTS AND ACCESSORIES



...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

SATELLITE TV

FREE DSS TEST CARD Information package. Turns on all channels. Write SINGNAL SOLUTIONS, 2711 Buford RD. Suite 180, Richmond, VA 23235.

SATELLITE DESCRAMBLER. PROGRAMMING PACKAGE AUTHORIZES ANY SATELLITE TO RECEIVE ALL CHANNELS AVAILABLE, INCLUDING PREMIUMS AND PAY-PER-VIEWS. \$99.95. 800-333-6150. www.satellite2000.net

INTERNET

FREE CONFIDENTIAL AUDIO/VIDEO DEALER COST SHEETS
WWW.COSTSHEETS.COM

PAGE	ADVERTISER	WEB SITE/E-MAIL	TELEPHONE
55	Adcom	www.adcom.com	732-390-1130
76	American Gear	www.american-gear.com	800-700-4542
13	Bose Corporation	www.bose.com/lifestyle	800-444-BOSE Ext. 642
48	Bryston Ltd.	www.bryston.ca	800-632-8217
4	B&W Loudspeakers of America	www.bwspeakers.com	978-664-2870
47	Cambridge SoundWorks	www.hifi.com	800-367-4434
8	Classé Audio	www.classeaudio.com	514-636-6384
28	Crutchfield	www.crutchfield.com	800-955-9009 Ext. AU
62	Gekko Flat Speakers	www.gekkoaudio.com	800-278-3526
22	JM Lab	www.audioplusservices	800-254-2510
79	J&R Music World	www.jandr.com	800-221-8180
74	Kimber Kable	www.kimber.com	801-621-5530
18	Klipsch	www.klipsch.com	800-KLIPSCH
73	Legacy	www.legacy-audio.com	800-283-4644
14	Madrigal	www.madrigal.com	800-346-0896 Dept. AU
CIV	Marantz America, Inc.	www.marantzamerica.com	630-307-3100
56	Martin Logan	www.martinlogan.com	785-749-0133
20	Media Lab	www.medialab-hifi.com	877-63-MEDIA
7	Meridian America, Inc.	www.meridian-audio.com	404-344-7111
58	Mirage Speakers	www.miragespeakers.com	416-321-1800
68	M&K Sound Corporation	www.mksound.com	310-204-2854
71	NAD Electronics of America	www.NADelectronics.com	800-263-4641
26,27,39	Paradigm	www.paradigm.ca	905-632-0180
20	Parasound	www.medialab-hifi.com	877-63-MEDIA
65	Parliament		
2,3	Philips	www.philipsUSA.com	
77	Pro Sound Stage and Lighting	www.pssl.com	800-672-4268
21	PSB Speakers	www.psbSpeakers.com	888-772-0000
CII, P1	SONY ES Separates	www.sony.com	
54	Tannoy	www.tannoy.com	519-745-1158
9	Vandersteen Audio	www.vandersteen.com	209-582-0324
CIII	Velodyne	www.velodyne.com	408-436-7270
25	VISA	www.visa.com	

AUDIO, March 1999, Volume 83, Number 3. **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 Curtis Circulation, Inc. Periodicals postage paid at New York, N.Y. 10019 and additional mailing offices. One-year subscription rates (12 issues) for U.S. and possessions, \$26.00; Canada, \$34.00 (includes 7% GST tax; Canadian Business Number 126018209 RT, IPN Sales Agreement Number 929344); and foreign, \$34.00.

AUDIO® is a registered trademark of Hachette Filipacchi Magazines, Inc. ©1999, 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 303/604-1464; fax, 303/604-7455.

Back Issues: Available for \$6.95 each (\$8.25 Canada; \$13.25 other foreign) in U.S. funds. Please add \$1.00 for the Annual Equipment Directory (October issue). Send a check or money order to ISI/AUDIO Magazine, 30 Montgomery St., Jersey City, N.J. 07302, or call 201/451-9420.

Occasionally we share our information with other reputable companies whose products and services might interest you. If you prefer not to participate in this opportunity, please tell the operator at the following number: 303/604-1464.

AUDIO

SUBSCRIBER SERVICE

PLACE LABEL HERE

MOVING? Please give us 8 weeks advance notice. Attach label with your old address, and write in new address below.

NAME _____

ADDRESS _____

CITY _____

STATE _____

ZIP _____

1(303)604-1464
FAX 1(303)604-7455

AUDIO
P.O. Box 52548, Boulder CO 80322

PlayBack

CAMBRIDGE SOUNDWORKS DESKTOP THEATER 5.1

What's the difference between a PC with DVD-ROM and a home theater? Screen size and Dolby Digital surround? No, make that just screen size, thanks to Cambridge SoundWorks' DeskTop Theater 5.1. For \$300, it includes everything you need for single-listener surround except the DVD drive and MPEG-2 decoder: You get four small satellite speaker cubes, a slightly larger center cube, a woofer halfway in size between a breadloaf and a breadbox, an amplifier with a built-in surround decoder, and a variety of stands and mounts for the speakers. The system can decode digital signals into Dolby Digital or Dolby Pro Logic surround; analog signals can be played in Pro Logic, stereo, or one of three



GRADE: B+

surround sound fields designed for use with stereo signals; and it can also synthesize surround from mono. If you have a bilingual disc with separate languages in each channel, you can play either stereo channel by itself. A circulating noise signal helps you set the center, woofer, and surround levels to match your setup. And setup is simplified by such little niceties as identification tags for the speakers and their plugs.

The amp is rated to deliver 5 watts to each main front and surround speaker and 15 watts apiece to the center and the woofer—plenty, when you're sitting so close to the speakers. Though it's not the system I'd choose for my symphonic listening, it worked fine for movies. Surround not only gave me a sense of space but also seemed to enhance the speakers' timbre. (Cambridge SoundWorks: 311 Needham St., Newton, Mass. 02164; 800/367-4434; www.hifi.com.)

Ivan Berger

Fostex CR-200 CD Recorder

It's great to see prices of stand-alone CD recorders fall to nearly \$500. The catch, however, is that most CD-R machines require the royalty-paid consumer-audio discs that cost far more than the data/pro discs that computer and professional CD burners can use.

One way out of that jam is the Fostex CR-200. Priced at \$1,495, this designed-for-musicians, stand-alone CD-R deck can record onto those \$2 (and cheaper) CD-R write-once discs. It has a host of high-end features, including a built-in sampling-rate converter, balanced XLR and unbalanced RCA analog inputs, three types of digital inputs (AES/EBU professional, Toslink optical, and coaxial), and a digital output. The Fostex recorder also has a Pioneer Stable Platter transport, recording level meters, a headphone jack with separate volume control, and a switchable copy-limit function. A full-function remote control is included.

The CR-200 is simple to use: Pop a blank CD-R upside onto the platter, and commence recording. Dubbing from another CD player is easy using the Digital Synchro mode, which enables exact transfer of CD, MD, or DAT audio and accompanying track numbers and time information. And you can manually place track IDs on the CD for both analog and digital sources. The CR-200 automatically converts digital signals having 32- or 48-kHz sampling rates to 44.1 kHz so they can be recorded onto CD. Once a recording is done, you permanently write the table of contents with a simple sequence of button pushes. Presto, you've got a CD that's compatible with any player.



The recorded audio quality from the Fostex CR-200 was first-rate with analog or digital sources. And when I made direct dubs from DAT or CD, I couldn't tell the difference between an original and its clone. I'm giving the CR-200 a B grade rather than an A because it is quite a bit more expensive than most other CD-R decks. But in performance, it is indeed Grade A. (Fostex: 15431 Blackburn Ave., Norwalk, Cal. 90650; 562/921-1112.)

John Gatski

GRADE: B

John Gatski

WYETECH TOPAZ 211A SINGLE-ENDED TUBE AMP

An \$11,000 single-ended stereo tube power amplifier from Wyetech Labs, a small Canadian company, the Topaz 211A is very impressive. Rated at 18 watts per channel and weighing in at a backbreaking 106 pounds, this amp is a marvel of build and parts quality. It uses one of my favorite output tubes, the carbon-plate 211, which has a directly heated thoriated-tungsten filament. Other parts used in the Topaz include AudioNote output transformers, Solen polypropylene capacitors, and Holco and RCD resistors. Many of the components are mounted to turret terminals plugged into Vector circuit boards, with short wires beneath the boards connecting the terminals.

The Topaz 211A's sound matched its build quality. Used with a pair of Tannoy's highly efficient (and highly revealing) Churchill speakers, the Wyetech amp sounded very relaxed and natural. It had great dynamics, inner detail, and space, and the bass was very powerful, tuneful, and extended. This is one of the best single-ended amps I have ever auditioned. (Wyetech Labs: c/o North-Country Audio, Cadence Building, Redwood, N.Y. 13679; 315/387-2852; www.cadencebuilding.com.)

GRADE: A+



Bascom H. King

"How do they get this kind of bass out of such a tiny box? Deep, tight, tuneful, and loud enough to rattle pictures on the wall—this is serious subwoofing!"

Stereophile Guide to Home Theater,
September 1998

Explore New
Depths.



For over 15 years, Velodyne servo subwoofers have defined—and redefined—the state of the art in low-frequency performance. Now, with the introduction of the HGS Series, we're offering you a chance to explore new depths. With over 3000 watts of power. Two full inches of linear excursion. Thirty times less distortion. Ruler-flat response to below 20 Hz. They are nothing less than the redefinition of the best subwoofers in the world. Velodyne invites you to experience them at select dealers worldwide.

Velodyne

1070 Commercial Street, #101
San Jose, CA 95112
Phone (408) 436-7270
Web www.velodyne.com

marantz®



In 1969, Marantz introduced the legendary Model Eighteen—the world's first high performance stereo receiver. Now, thirty years later, Marantz once again redefines the state-of-the-art with the extraordinary new Marantz SR-18 THX® Ultra receiver.

Featuring both Dolby® Digital and DTS® surround sound processing, the SR-18 comes packaged in an all metal alloy chassis, elegantly finished in black or champagne. It delivers 140 watts of pure, clean THX power to each of its five main channels. All the Marantz luxuries from Gyro Touch tuning to copper plated HDAM preamps have been included.

The SR-18 provides enough digital and analog inputs and outputs to handle even the most sophisticated home theater system and is one of the first to include component video switching for today's advanced TV monitors and DVD players.

The Marantz SR-18 is a state-of-the-art component in every respect, reflecting a proud heritage few peers can equal. See it at your Marantz audio/video specialist today.

The Tradition Continues...

Marantz America, Inc., 440 Medinah Road, Roselle, IL 60172 Telephone: 800-270-4533, Ext. 101
www.MarantzAmerica.com

*DOLBY DIGITAL® is a trademark of Dolby Laboratories Licensing Corporation. DTS is a registered trademark of DTS Technology. THX is a registered trademark of Lucasfilm Ltd.

because music matters