## NDUSTRY'S BIBLE-YOUR BEST GUIDE TO HI-FI GEAR



THE EQUIPMENT AUTHORITY OCTOBER 1994 ANNUAL

# Directory 

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7-disc MusicBank ${ }^{\text {TM }}$ system:
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HCA-2200" Stereophile calls our HCA-2200", ". . a a benchmark product against which other amplifiers can be measured." And why not? John Curl incorporated everything the most musically obsessed person could ever want.
hances are, a perfect evening consists of unplugging the
phone, centering yourself in front of your audio system and
getting lost in your favorite recordings. And we bet when
you're not listening to music, you're working so you can buy
more music. Admit it, you're obsessed.

But take heart, you're not alone. There are lots of people

# We're Not S They All Come Wi 



P/LD-1100 and T/DQ-1600 The P/LD-1100 is a remote controlled line drive preamp designed by John Curl. The T/DQ-1600 is a remote controlled broadcast reference tuner. Did we mention they can be controlled with the same handset?


HCA-1000 and HCA-600 The HCA-1000 is our latest THX-certified amplifier. The HCA-600 incorporates advanced direct coupled circuitry like our more powerful amps. Both are bridgeable for highpowered monoblock performance.
like you. We know because here at Parasound, music happens
to be our passion.

This approach to music has attracted its share of fanatics.

People like our principal audio designer, John Curl. (Talk
about passion - he was so possessed with making music come alive that he practically invented high-end audio in the '70s.)

It's also attracted high-end audio reviewers - who not
only praise our products, but often purchase them for their own listening pleasure.

This dedication to music also goes a long way toward
explaining all the products we've been developing, including
five high end/home theater amplifiers, our third D/A converter, CD player/transport, a remote-controlled tuner and line-drive preamp. Each design is guided by a philosophy which dictates that you get the best possible products


D/AC-1500 and C/DP-1000 The D/AC-1500 is our premier digital to cualog converter. The C/DP-1000 is our high resolution $C D$ player. With the simple addition of our Advanced Digital Adaptor Module (an ST optical link). it's transformed into a high performance $C D$ transport.
anywhere for a price nearly everyone can afford.

Of course, since you have to turn them on at least once,
they all come with a power switch. But don't worry, you can always ignore it.

And we'll take that as a compliment, thank you.


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affordable audio for the critical listener
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HCA-1206 With a total of 720 watts on six channels, our HCA- 1206 is the most powerful THX-certified home cinema amp made. Sensitive enough to move your sosul, but powerful enough to move your foundation.


HCA-606 Our HC:A-606 is the slightly smaller kid brother of the HCA-1206. Both make wonderful multi-zone stereo amps for custom installations. And both can be bridged to four or five channets.

VOL. 78, NO. 10


THE EQUIPMENT AUTHORITY


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## FAST FORE-WORD


et me introduce Ken Kessler, a new writer here at Audio. He will write a column called "Mondo Audio" that will cover the high-end scene at the audio industry's trade and consumer shows. In addition, he will be interviewing the colorful characters who abound in this field. Ken's column begins this month and covers the Summer Consumer Electronics Show held this past June in Chicago. While I gave you a few quick impressions of the Show in last month's editorial, Ken will give you some additional insights into what may well be the last of the Chicago shows.

I have known Ken for some years now, both through his presence at press events and through his writing. I have always been impressed with his wit, as well as his insight and common sense. While he has the self-assurance to spare no one who acts the pompous dunce (including potential employers such as me), he also has good ears for quality gear and a sentimental streak for old-line firms. I had always thought of him as a British writer, since I first came across his work in England's Hi-Fi News and Record Review. However, he turns out to be a transplanted Yankee, but I'll let him tell his own story. . . .
"Having spent my junior year in England-I majored in English at the University of Maine, which had a program with the University of Kent in England-I returned to the U.K. as a permanent resident in 1974. I have been
an audio casualty since the age of 16 (1968) when I bought my first hi-fi system: Dual 1019 turntable, Pickering cartridge, Scott 344C receiver, and some small Scott speakers. I worked for a hi-fi shop in Orono, Maine, during my senior year, before returning to the U.K.
"My main interest was, is, and always will be journalism, so I come from a writing background. I 'happened' into hi-fi journalism after a few years contributing to various music and automotive magazines. I went full-time into audio journalism in 1983, working for the short-lived Stereo-The Magazine, then as Assistant Editor for $\mathrm{Hi}-\mathrm{Fi}$ News. I went free-lance in 1987, remaining with $\mathrm{Hi}-\mathrm{Fi}$ News as Contributing Editor, and wrote for The Absolute Sound and Stereophile. Currently, I contribute to audio magazines in England, Italy, France, Germany, Norway, Mexico, and Hong Kong, as well as to America's Glass Audio. Outside the audio field, I write for TOP, the British edition of Tower Records Pulse, and What Personal Computer in the U.K. I am about to start working for The Robb Report in the U.S.
"I number The Beatles, Buddy Holly, The Kinks, Squeeze, Buffalo Springfield, the Spin Doctors, and Jackie Wilson among the very greatest performers of the 20th century. I prefer tubes to transistors if the impedance allows it, and want to retire to Northern Italy-if and when."

I am very pleased to add Ken to our masthead.

One last announcement, and one I am also very pleased to make: Tony Cordesman will now be contributing solely to Audio where his equipment write-ups appear in our "Auricle" column.



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

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

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

One look, one listen, will confirm Carver's passion for aural perfection. Gold plated input jacks, 5 -way binding posts, dual analog meters. Expansive headroom that faithfully -
no, stunningly - reproduces the dynamic peaks of digital music and movie soundtracks.

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

With the infinite flexibility to accommodate system upgrades foryears to come.

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

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Spectrum Audio Loudspeaker
Mounted coaxially with the woofer, the tweeter of the Spectrum Audio 108cd is suspended on neoprene rings that isolate it from cabinet vibration; it's also placed asymmetrically, for improved diffraction control. The system uses an 8 -inch woofer and $3 / 4$-inch dome tweeter. Rated frequency response is 49 Hz to $21 \mathrm{kHz}, \pm 3 \mathrm{~dB}$, sensitivity is 91 dB , and power handling is 125 watts rms, 200 watts peak. Price: \$399/pair.
For literature, circle No. 200

## WHAT'S NEW

## Atlantic Technology In-Wall Surround Speaker

Since not all homes have bookshelves properly placed to hold surround speakers, the Atlantic Technology 254 SR can also be mounted in or on the wall. Its $31 / 2$-inch surround drivers are angled and in

## Hsu Research Subwoofer

## The HRSW12V, Hsu

 Research's first powered subwoofer, uses a 12 -inch, magnetically shielded woofer in a vented, cylindrical cabinet. The cabinet has a granite top, for use as an end table, and black knit cloth sides. The builtin amplifier, rated at 150 watts rms, includes a $24-\mathrm{dB}$ /octave Linkwitz-Riley crossover (which can be defeated for use with THX system crossovers), a polarity inversion switch, soft clipping, and a level control. Frequency response is $\pm 2 \mathrm{~dB}$ from 20 Hz up. Price: $\$ 800$ each. For literature, circle No. 201opposing phase, to randomize surround localization, while its 4 -inch woofer improves power handling and extends bass down to 50 Hz . Black or white grilles are available. Prices: \$299/pair, black; \$319/pair, white. For literature, circle No. 202



## Big Speaker Sound... <br> without the Big Speaker:

## WHAT'S NEW



## Marantz A/V <br> Tuner/Preamp

Marantz's first THX
controller, the AV-600THX tuner/preamp, includes THX re-equalization for overall tonal balance, surround decorrelation for enhanced surround spaciousness, THX
timbre-matching EQ for smoother front/rear pans, and a crossover that follows Home THX specifications. Other features include on-screen display, 30 -station AM/FM memory, and a calibrated volume control. Price: \$1,199.
For literature, circle No. 205


## Meridian FM Tuner

The Meridian 504 has a dual MOS-FET r.f. amp for wide dynamic range, matched-pair ceramic filters, and a lowdistortion, Walsh-function stereo decoder. An eight-character alphanumeric display can be
used to show station names or call letters; up to 30 station frequencies can be stored in memory. A communications link is provided for shared control and display functions with other Meridian 500-Series components. Price: $\$ 995$. For literature, circle No. 206


McCormack Audio Preamp The Micro Line Drive, from McCormack Audio, is a linelevel preamp with three inputs, one buffered tape loop, and two
outputs. It can be used in passive or active mode; the active mode offers three internally selectable gain settings. A muting switch is also provided. Price: $\$ 595$. For literature, circle No. 207


Custom Wosdwork \& Design Home Theater Cabinet
Just 46 inches wide by 57 inches high, the CWD Woodstock II can hold the electronics for a home theater system, including a 35-inch TV. Adjustable shelves divide the space below the TV into six compartments; fatric-grille
doors are optional, to pass remote-control beams or the sound of a center speaker. The narrow cabinet allows external speakers to be mounted close to the screen. Available finishes irclude cherry, mahogany, spice, hunter green, white birch, and satin blue with cher $y$ accents. Price: $\$ 1,200$.
For literature, circle No. 208

## MacTec CD Dividers

A navigational aid for large CD collections, MacTec DiscPickables are CD-sized cardboard separators with index tabs that can be bent for easier viewing and relabelled at will. Dividers are available with vertically lettered tabs, as shown, for shelved collections and with horizontally lettered tabs for CD stacks or drawers. Each pack contains 12 preprinted tabs (AB through


XYZ ) and four blank tabs for custom labelling. Price: $\$ 5.99$ per pack.
For literature, circle No. 209

## Adcom would

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clear.

Regardless of how sophisticated your stereo and video system is, it may never achieve its full performance if plugged directly into an AC outlet. Raw and unprocessed AC power can severely diminish the clarity of audio signals and reduce the resolution of your video picture.

ADCOM's ACE-515 AC Enhancer significantly improves the performance capabilities of your system by filtering and processing raw AC power, unveiling a pure, noise-free power source.

## Listen To The Critics

". . . the effective suppression of $A C$ ' $R F$ hash' by the ACE-515 improved clarity and lowered noise in all three $C D$ players. . . the significant improvements in instrumental and vocal harmonic retrieval and hall ambience are superb.... it simply appears to allow musical information to be passed through to the listener with less veil and electronic 'haze.'"
-Lewis Lipnick, Stereophile, Vol. 11 No. 4, April 1988.
Recommended accessory in Stereophile, Vol. 12 No. 4, April 1989.

## Line Protection: It Pays For Itself

The ACE-515 also protects your valuable equipment from harmful high-voltage spikes and surges. And, its sequential turn-on/turn-off control circuit guards your speakers from disturbing, damaging thumps.

## Again, The Critics Agree

"Eloctronic equipmen' (especially digital audio gear) is vulnerable to both anno-ing and catastrophic power-line problems. Your stereo gear should have line spike and surge protection, with hash filters thrown in too. Line protection-you can pay a little for it now, or you can pay a lot for it later."
-Ken Pohlman, AUDIO, November 1987.
For a modest investment, the ADCOM ACE-515 enhances both audio and video clarity while protecting your equipment from damaging line voltage disturbances. Once again, ADCOM lives up to its reputation of offering superior performance at a reasonable cost. For complete technical data, please visit your Adcom dealer. You'll discover the ACE-515 is more than an accessory. It's a necessity.


## WHAT'S NEW



Diablo Acoustics Loudspeaker
The Diablo Model 2 is a floor-standing, three-way, sealed-box speaker. Arrayed in a D'Appolito configuration, the five drivers include two 10 -inch long-throw woofers, two titanium-dome midranges, and one titanium-dome tweeter. Rated anechoic frequency response is 35 Hz to $26 \mathrm{kHz}, \pm 3$ dB ; typical in-room bass response is 3 dB down at 26 Hz . Sensitivity is 87 dB ; nominal impedance is 4 ohms, minimum 3 ohms. Price: $\$ 9,000$ per pair. For literature, circle No. 210
 with a -3 dB point of 60 Hz ; response is within -3 dB to 10 kHz over an off-axis range of $\pm 30^{\circ}$. The speaker is available with a black or gray Nextel finish. Price: \$2,000 per pair. For literature, circle No. 211

## Cambridge SoundWorks Multimedia Speakers

SoundWorks by Henry Kloss is Cambridge SoundWorks' first speaker system for multimedia computer use. Two three-inch cubes contain shielded longthrow 2-inch drivers that cover: frequencies above 150 Hz ; bass is handled by a $41 / 2$-inch woofer that shares a small ( $5 \times 8 \times 9$ in.) cabinet with a three-channel amp whose output is tailored to the speakers. The amp can operate
from an internal a.c. supply or external $12-\mathrm{V}$ sources such as batteries. Supplied accessories include desktop stands for the satellites and hookup wire. An optional wired rensote provides volume control plus an additional input that can be heard instead of the computer's output or blended with it. The system is available in gunmetal gray Nextel or standard gray-beige. Price: $\$ 179$ per system; remote, $\$ 29.95$. For literature, circle No. 212



## Energy Surround Speakers

Like many surround speakers, the Energy RVSS uses dipolar radiation to create a diffuse, "sourceless" sound field. But at low frequencies, the output from a dipole's two sides cancels, sacrificing bass. The RVSS therefore uses bipolar radiation below 400 Hz , for bass with a rated -3 dB point of 65 Hz . Sensitivity is 86 dB ; nominal impedance is 6 ohms, and minimum impedance is 4 ohms. Cabinets are available in black or white, with matching grille cloth. Price: $\$ 550$ per pair.
For literature, circle No. 213


Niles Audio Outdoor Speaker
Designed for use indoors or out, the Niles OS-10 features a cabinet of mineral-filled polypropylene, with powdercoated aluminum grilles and mounting brackets. The $51 / 4$-inch woofer is of polypropylene with a butyl rubber surround; the 1 -inch dome tweeter has a microscopic rubber coating that provides both waterproofing and extra high-frequency damping. The curved grille is designed to reduce diffraction, while the wedge-shaped cabinet allows a wide range of installations.
Price: $\$ 379.95$ per pair.
For literature, circle No. 214

# HGH TECHNOLOGY WITHOUT THE HIGH ANXIETY 

## How To Bring Home The Right Home Theater Receiver.




The Class $H+$ amp sends equal power to all the channels for oplimum bome theater sound.

ALL YOU HAVE TO KNOW ABOUT

HOME THEATER RECEIVERS IS ONE

NAME. TECHNICS. TAKE OUR NEW

SA-GX770. IT'S POWERFUL. IT'S

In EnTE EASY TO OPERATE. AND
HIENIS Dolby* Pro Logic

SURROUND ENVELOPS YOU IN LIFE-

LIKE HOME THEATER SOUND.** The

TECHNICS HOME THEATER RECEIVER.

YOU'LL GIVE IT TWO THUMBS UP.


The remote controls other Technics atidio components and most brandname video components.


The low impedance suitch beips prevent blowing or damaging your speakers.


Audio Alchemy Phono Preamp Suitable for MM or MC cartridges, Audio Alchemy's VAC-in-the-Box (for
"Vinyl/Analog Converter") has a differential FET input, passive filtration for the first pole of the RIAA equalization curve, lowimpedance input-isolation
buffers, and separate left- and right-channel power supplies. Internal jumpers are used to select input-termination capacitance and resistance and gain of 40,50 , or 60 dB . RIAA accuracy is $\pm 0.1 \mathrm{~dB}$, and $\mathrm{S} / \mathrm{N}$ is better than 90 dB . Price: $\$ 259$. For literature, circle No. 215

## DPA Digital D/A Converter

DPA Digital's
DX processor technology allows the PDM 1024 to have a radically simple analog stage (two resistors, two capacitors, and a balanced op-amp). Other features include useradjustable dither levels, eight 32-bit floatingpoint digital filters, eight noise shapers, and 128 -times oversampling. Connections include four coax, three


Toslink, and one AT\&T-style digital inputs; the analog stage has balanced output.
Price: \$9,995.
For literature, circle No. 216


## Proceed A/V Preamp

The Proceed PAV, from Madrigal Audio Laboratories, incorporates surround processing and input switching for a home theater system. Home THX and Dolby Pro Logic surround modes are provided for movies and videos, stereo surround for music, and a surround simulation mode for monophonic movies and
recordings. The stereo surround mode derives its cues from ambient information in the recording. Six audio-only inputs (two balanced) and four A/V inputs (with composite or $S$-video formats) are provided. All inputs can be routed to the main, record, or remote output, in any combination. A "learning" remote conrol is provided. Price: $\$ 4,195$. For literature, circle No. 217

California Audio Labs
Compact Cisc Player

California Audio abs' own digital-seivo laser transport forms the basis of the DX-1. The Delta Sigma one-bit D/A converter is mountec on the transport circuit joard, to
shorten the digital signal path and increase isolation between the digital and analog stages. A multi-layer steel subchassis is used to counter the effects of external vibration. A 16-function remote control is supplied. Price: \$595. For literature, circle No. 218


Yamaha Cassette Deck
Yamaha's first cassete deck with Dolby S noise sedlection, the KX-580 also fearures Dolly $B$ and C NR plus HK Pro headroom-extension circuitry. The $\mathrm{S} / \mathrm{N}$ with Dolby S is 80 dB . Other features include synchro start when used with Yamaha CD players, manual jias adjustment (and an extra-high bias frequency of $16(\mathrm{kHz}$ ),
"Play Trim" to correct for differences in Dolby level settings between decks, bidirectional intro scan, and separate power supplies for signal circuits and mechanical operations. Prequency response is 20 Hz to 20 kHz , $\pm 3 \mathrm{~dB}$, with metal tape; wow and flutter is $0.05 \%$. Prices: \$399; optional remote control, $\$ 30$.
For literature, circle No. 219


Spend a couple granc on an amplifier with an internal layout reminiscent of a bowl of spaghetti. Burn it in for at least six weeks (don't even dream of tuening it off). Send it out to be tweaked (to improve definition and eliminate glare from ail recordings). Install a line filter hoping to reduce that buzz in the right channel. Place an ad in the classifieds: " $\$ 800$ or best offer." Start looxing for the next rage in amplification.

There are lots of pretenders promising high-end performance at an affordable price. This amplifier delivers. Our audition policy guarantees it."

220 watts per channel into 8 ohms • Class $A / A B$ design • $100, C 00$ microfarad of storage $\bullet$ zero negative feedback D.C. coupled circuitry $\bullet 1400$ watt toroidal transformer • balanced and single-ended inputs $\bullet$ biwire capability

# WHaT’S NEW 



## Cerwin-Vega

Home Theater Speakers
The Sensurround System 6, from Cerwin-Vega, is a six-piece home theater system. The four HT-S5 satellites used for front left and right and rear/side surround, are shielded two-way units with 5 -inch woofers and rated frequency response of 125 Hz to 20 kHz and self-resetting tweeter-protection devices. The

HT-SMC center-channel speaker is shielded and uses a 4 -inch x 10 -inch elliptical driver. And the HT-10D subwoofer has a 10 -inch driver with dual voice-coil, in a bass reflex enclosure; it's rated to cover 40 to $125 \mathrm{~Hz}, \pm 2 \mathrm{~dB}$. All speakers are finished in black woodgrain vinyl. Prices: System, $\$ 1,155$; HT-S5 satellites, \$330/pair; HT-SMC, \$165; HT-10D, $\$ 330$.
For literature, circle No. 223

## Derek Speaker-Sculpture Loudspeakers

At first it looks like a microphone, but the Cobra, by Derek Speaker-Sculpture (on right) is a tubular transmission line, 35 inches high, housing a 5 -inch driver; rated frequency response is 50 Hz to 16 kHz . The Scorpion 12 -inch woofer (on the left) also has a tubular
transmission line behind it, for a rated response of 21 to 120 Hz . Prices: Cobra, \$1,100 per pair; Scorpion, $\$ 1,650$ each.
For literature, circle No. 222


## JMlab Speaker

Standing 433/4 inches tall, the JMlab 913.1 Spectral is a three-way system using four drivers. Its two 8 -inch woofers and its 5 -inch midrange use cones of resinsuspended glass microspheres sandwiched between thin Kevlar sheets, for lightness and rigidity. The tweeter's 1.2 -inch titanium dome is coated with a titanium dioxide damping layer; the 4 -inch tweeter magnet weighs 3.3 lbs . Each woofer is housed in a separate, vented, sub-enclosure. The overall cabinet is of $3 / 4$-inch MDF, braced at the sides by $3 / 4$-inch layers of African anigre wood; the front baffle has rounded edges to minimize diffraction and a foam coating to minimize early reflections. Rated frequency response ( $+0,-3 \mathrm{~dB}$ ) is 35 Hz to 25 kHz on axis and to
$22 \mathrm{kHz}, 30^{\circ}$ off axis. Price: $\$ 4,295$ per pair.
For literature, circle No. 224


Counting Crows: August And Everything After (Geffen) 02409
Snoop Doggy Dogg: Doggystyle
(Interscope) 01692
R. Kelly: 12-Play
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## John Michae

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Grammy's Greatest Country Moments: Vol. 1 (Atlantic) 02995
Glenn Jones: Here I Am (Atlantic) 02998
Primus: Miscellaneous Debris (Interscope) 03010 Frank Sinatra: Duets (Capitol) 03039
Lena Home: We'il Be Together Again (Blue Note) 03327

## Classical Favorites

Zinman: Górecki, Symphony No. 3 (Nonesuch) 00110

## John Williams:

Schindler's List/Sdtrk. (MCA) 00297
The Piano/Sdtrk. (Virgin) 02462
Empire Brass: Royal Brass (Telarc) 02712 Enrico Caruso: Caruso In Love (RCA Victor Gold Seal) 02718 Leontyne Price: Barber, Hermit Songs (RCA Hermit Songs (RCA
Victor Gold Seal) 03098 Cecilla Bartoli: Rossini Recital (London) 05679 Van Cliburn In Moscow Rachmaninov \& Brahms. (RCA Victor Red Seal) 0574

Cecilla Bartoli: The mpatient Lover London) 44664
David Zinman: Copland, Rodeo (Argo) 53352
Puccini, La Bohème Freni, Pavarotti et al. Berlin PO/Karajan. (London) 05615 -
James Galway: ConcertolGalway Plays Mozart (RCA Victor Red Seal) 01742
Mad About Mozart (DG) 02492
Pomp \& Pizazz: March Favorites Cincinnati Pops Kurzel. (Telarc) 02713 Pavarotti: My Heart's Dellght (London) 02953 Kiri Te Kanawa: Kiri Sings Porter (Angel) 02958

José Carreras: With A Song in My Heart - A Tribute To Mario Lanza (Teldec) 21039


Chant: The Benedictine Monks of Santo Dominge de Sllos (Angel) 02957 Carreras, Domingo, Pavarottl: 3 Tenors (London) 35078 Kathleen Battle: Bel Canto (DG) 44673

Above The R1m/Sdtk. (nterscope 03156

## The Jazzhole

 (Jluemoon 03329 Fam Tillis: Sweetheart's Dance (Arsta) 03050 Linda Dav s: Shoot For The Moon (Arista) 03051Sheryl Crisw: Tuesday Might Music Club (A\&M) 03061
Outkast:
Southernplayalisticadiliac muzik (La Face) 03062 \&

The Neville Brothers: Live On Planet Earth (A8MM) 03065
Elton John: Greatest Hits (Polydor) 03077
Live: Throwing Copper (Radioactive/MCA) 03085 Lorrie Margan: War Paint (BNA) 03092
A Tribute To Miles (Qwest/Reprise) 02741 John Coltrane: A Love Supreme (MCA) 03165
New York Voices: Collection (GRP) 03238 Anthrax: Live- The Island Years (Island) 03159
With Honors/Sdtrk.
(Sire/Maverick) 03163 !
Randy Travis: This Is Me (Warner Bros.) 03171 Jimi Hendrix: Blues (MCA) 03240
Travis Tritt: Ten Feet Tall And Bulletproof Warner Bros.) 03244
Pretenders: Last Of The Independents Warner Bros./Sire) 03245
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The Crow/Sdtrk. (Atlantic) 03173 Reba McEntIre; Read My Mind (MCA) 03243 All-4-One (Atlantic) 03267 SWV: The Remixes (RCA) 03301
Jimmy Buffett: Fruitcakes (MCA) 03336
Joshus Redman: Wish (Warner Bros.) 73289 Patti LaBelle: Gems (MCA) 03338
Tracy Byrd: No Ordinary Man (MCA) 03339
Maverick/Sdtrk. (Atlantic) 03378
Bob Mintzer/Michael Brecker: Twin Tenors (Novus) 04839
Damion "Crazy Legs"
Hall: Straight to The Point (MCA) 03390 The Flintstones: Music From Bedrock/Sdtrk. (MCA) 03397
David Byrne (Luaka Bop/Wamer Bros.) 03414 Carpenters: The Singies 1969-1973 (A\&M) 04393

## Kiss My A**

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The Best Of Woodstock (Atlantic) 04908
Heimet: Betty
(Interscope) 04910
Sammy Kershaw: Feelin' Good Traln (Mercury) 04914
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(Interscope) 04922
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recording when it is used in conjunction with IVC CD players. A 24-key remote control and a rechargeable battery are supplied; a car battery adaptor is optional. Price: \$1,299.95
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Sony DAT Recorder
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allows simultaneous recording and playback monitoring. The four-motor, direct-drive transport is mounted midship, to resist vibration and separate the digital and analog circuits. A low-noise, FET microphone preamp is provided, for live recordings. Price: $\$ 2,500$. For literature, circle No. 229
 CT-23 tuner/preamp are aimed at home theater use: It has video switching as well as audio connections, and separate FM antenna inputs are provided for cable and over-the-air signals. The CT-23 also includes Sonic Holography
spatial-
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## SIGNALS \& NOISE

Parting is Such Sweet Sorrow Dear Editor:

I am writing this in regard to my decision not to renew my Audio subscription. It seems when parting with an old and good friend that more is required than just a goodbye. I started out with Audio roughly 20 years ago, drawn to that first issue by a "how-to" article on mike placement for recording various instruments. My involvement with recording music at the time was demanding more knowledge, and Audio delivered some good basics in that area. My focus has shifted even further towards sound recording, specifically in the pro and home-studio environment, and I'm taking publications to cover this area. Thus I've had to sacrifice my Audio subscription as there just aren't enough funds to go around like there used to be.

The decision to subscribe to Audio was easy, and my relationship with you folks has been informative, entertaining, and always top notch. There have been very few issues that I have not read cover to cover. (Yes, I even enjoy the auto-sound issue!) I've enjoyed everything from equipment reviews to album reviews, interviews to "how to's," and your questions and answers on technical whys and hows.

I appreciate all those who have written and now write for Audio. I will miss Messrs. Burstein, Whyte, and Feldman very much, as much of what I know about audio I learned from them, along with all your other folks. Mr. Canby and Mr. Giovanelli are always must reads. With them, I have discovered old and new things and learned much. Jon and Sally Tiven and Michael Tearson have become trusted opinions when I consider music purchases. All the other authors, who are too numerous to mention (and who my mental facilities may not remember), have added to the rich experience of my Audio readership.

Audio will always be a part of my life and I thank you for being able to partake of such a fine magazine. You've been very special. If you would, could you give all your people a sincere thanks from me? Who
knows, I may join back up at a later date. I'm sure when I do, I'll find the same excellent magazine I have enjoyed these last 20 years or so. Thanks again!

Ron Carlson
Boone, Iowa

## Polarity Audible?

## Dear Editor:

Dan Shanefield comments in June's "Signals \& Noise" about my article, "A Quest for the Audibility of Polarity" (December 1993), that I was not clear on the issue of the audibility of acoustic polarity during normal stereo audition in normal listening rooms. He quotes me correctly, and I am sure that I said what he claims is on the tape of the conference. I have not heard it. I would like to clarify my comments as follows. I believe our large-scale tests indicate a slight positive result for the audibility of acoustic polarity inversion. These results are for a simplified listening situation. I can state that I have never heard, nor has anyone I would trust claimed to have heard, the effect of polarity inversion in normal stereo audition in normal listening rooms with normal program material.

As for the Clark Johnsen comments I respond as follows. Our paper does not claim to have all references ever written on this issue, and many are indeed omitted. I am quite familiar with the Richard Heyser comments from Audio, August 1979 as well as his references and many others as well. He makes an impassioned plea to the industry to keep track of absolute polarity. I discussed this with him many years ago, and I am in total agreement. However, in the ensuing 15 years very little has been done about keeping track of absolute polarity by the recording industry. I find nothing curious about the omission of a reference to his comments since the article contains only personal opinion and no technically supportive information or data.

Believe me, I do not underestimate the quality research done by others. I know many of the persons who have done this research, have high respect for their work,


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and have in many cases discussed their work with them personally. This is especially true of Richard Heyser and Professors Lipshitz and Vanderkooy.

Nor do I find the article "equivocal" in any way. Equivocal means open to two interpretations or intended to mislead or confuse. Quite to the contrary, our intention was to report what was discovered in some very careful experiments. And, to explain how we tried to track down the reasons for the elusiveness of the audibility of polarity inversion.

We found that the issue is not black or white, i.e., that polarity can or cannot be heard all of the time in all circumstances. . Instead we found that the issue has many shades of gray. Audibility of polarity depends on the signal being auditioned, the listening conditions, and the acuity of the listener. That we were not able to pin down the exact conditions is related to the complexity of the problem. No one else has reached a final understanding either. I believe that efforts to resolve the conditions under which absolute polarity is audible

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my little "dirtbox" networks on several recordings played back in mono, and even on a very few in stereo. If I change the resistors so that only $1 \%$ distortion is added, I think I can hear inversion on mono playback of some Sheffield recordings and my own solo tapes, but I haven't done a dou-ble-blind test. You can claim to your friends, if you do a demo with this little dirtbox, that the less asymmetry it takes to make this audible with your system, the less distortion there was in your system to start with. If you could already hear polarity reversals, even before adding the network, then I think that there was already plenty of second harmonic distortion somewhere in your system-most likely in the speakers, but maybe even right in your own ears! (I've done a slightly longer piece on this for the Boston Audio Society Speaker and the newsletter of the Southeastern Michigan Woofer and Tweeter Marching Society.)
Please note that I'm not claiming that Johnsen and others can't possibly hear pure polarity itself-I'm only claiming that there's another possible explanation, which should always be considered. Dick Greiner said his speakers had "low" distortion; when I asked him how low, he said below $1 \%$ total, with minimum-phase and linearphase behavior. That's right on the borderline, so it leaves me uncertain-not negative, just uncertain.

> Daniel J. Shanefield Rutgers University
> Piscataway, N.J.

## P.S. On Polarity

## Dear Editor:

R. A. Greiner and Douglas E. Melton's article, "A Quest for the Audibility of Polarity" (December 1993), is a wonderful piece on an interesting and important subject that's been ignored for too long.

It's an area that's ripe for experimentation. The average audiophile can participate too. You just need to simultaneously reverse the wires to both the left and right loudspeakers to invert the polarity of reproduced sound in your room. Then listen carefully to recordings while switching loudspeaker polarity. You may be surprised at the differences in what you hear.

John Sehring Baker, Mont.

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## Two Thumps Up

Dear Editor:
I would like to thank John F. Sehring for his excellent article, "One Thump or Two: The Advantages of Stereo Subwoofers" (February). I have wondered about the possible reduction of level when a monaural subwoofer is fed with out-of-phase low bass stereo audio signals.

Also, Mr. Sehring cleared up my confusion about whether sub-bass sound is localizable or not. My next subwoofer system will definitely be a stereo one.

## Ted Nguyen

New Orleans, La.


#### Abstract

Even the finest equipment cannot guarantee noise-free operation One "dirty" connection anywhere in the signal path can cause unwanted noise, distortion and signal loss. Considering the hundreds (if not thousands) of connections in electronic equipment today, it is only a matter of time before they begin to fail.




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## Mixed Signals

Dear Editor:
In the July 1993 "Signals \& Noise," John Pfeiffer referred to a CD of the NBC Symphony Orchestra broadcast of April 4, 1954. A reader had queried him on the source of the master tape. Pfeiffer suggested that because the CD lacked the broadcast interruption (when Toscanini failed),
the Compact Disc's master tape was not from the experimental tape Pfeiffer made and that it must be a reprocessing of a mono tape. I think Pfeiffer must have been a little mixed up. The broadcast was from a separate group of microphones and a separate, mono mix. The interruption was only of the broadcast, not the experimental stereo tape.

I have had a copy of that tape for several years. I heard rumors of such a recording for years, then suddenly, there it was. I dubbed it on loan from a small record

## RCA/BMG SHOULD

 CONSIDER RELEASING THE UNDAMAGED WAGNER SELECTIONS ALONG WITH THE ROSSINI OVERTURE.company who apparently provided it to the company that made the referred-to CD. That tape had some problems with drop-out as it was in quarter-track mode. It was further blemished with noise, hum, thin bass, no upper-highs, etc. The CD sounded just like that quarter-track tape. Luckily I recognized these problems at the time and with the aid of sophisticated instruments, I was able to make significant improvements in all those areas while dubbing my own, much superior copy. That tape is definitely stereo. The instruments are definitely separated, not the frequency. You can even hear Toscanini walking and the radio announcer's voice bleeding from the broadcast booth.

I think that the original master tape that Pfeiffer made would sound even better and that RCA/BMG should consider releasing the undamaged Wagner selections along with the Rossini overture from the week before (apparently RCA lost the third movement of the Tchaikovsky "Pathétique"). It really is such a shame that we had to wait a lifetime to hear this and it's still not the original. In the meantime, RCA's tapes either rot in their vaults, get lost, or are destroyed.

Mike Stosich
Senior Design Engineer
Blaupunkt Radio
Broadview, Ill.

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My Mind (MCA | Nashville) $\quad 4790717$ |
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| Peter Gabrie1-Shaking | Peter Gabriel-Shaking

The Tree (Getfen)
415-968 The Police-Every Singles (A\&M) 348-318 Linda Davie-Shoot For The Moon (Arista)
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Live On Planet Earth (A\&M) $\quad 478 \times 412$ Sammy HagarUnboxed (Geffen)
$478 \cdot 107$ James Taylor-Live

 In Their Hearts
(Capitol)
4770505 John Michael $\begin{array}{lr}\text { Montgomery-Kickin+ It } \\ \text { Up (Atlantic) } & \mathbf{4 7 3 \cdot 1 5 7}\end{array}$ Guns N' Roses-Use
Your Illusion I (Geffen) Your

Ozzy Osbourne-No More Tears (Epic/ 428-128 Patty Lovelass-Only
What I Feel (Epic) Bon Jovi-Keep The Faith (Jambco/Mercury)
$451 \cdot 310$ 27 Top-Grt. Hits 438-010 The Robert Cray Band (Mercury) Persuader
(M26•189 Van Halen-For Unlawful Carnal Knowledge
(Warner Bros.) 420 -273 Frente-Marvin The Atlantic) 483-693
Patid Imbelle-Gems
(MCA) 486.808
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## Vince Gill-When Love Finds You

(MCA) 488.308 Alsn Jacirson-Who I Aallyah-Age Ain't Nothing But A Number (Blackground/Jive) Beartie Boys-II
 Pam Thilis-Sweetheart's
Dance (Arista) 4790683 John Scofield \& Pat Metheny-I Can See (Blue Note) $\quad 4770570$ Johnny CashAmerican Recordings Randy Travis-This is Me (Warner Bros.) 4770463

Pat Benatar-Best Shots (Chrysalis) 401~646
(Capitol) 4716615 Songs Of The Eagle Bryan Adams-So Far Featuring Clint Black, So Good (A\&M) 467•738 Yearwood, etc. (Giant) Hancock/Shorter/ Carter/Willams/Roney -A Tribute To Miles
Davis (Owest) $476 \times 382$ Indigo Giris-_Swamp Ophelia (Epic) 477•323 Nine Inch Nafls-The Downward Spiral (TVT/
Interscope) [56 4768 Eric Clapton-Unplugged (Reprise/Duck) 446-187 Barbra StrelsandBack To Broadway (Columbia) 461-988 Elvis Costello-Brutal Youth (Warner Bros.)
476.168
"8 Seconds"-Orig. Snditk. Featuring Reba McEntire, Vince Gill, etc. a) $475 \cdot 483$ Confederate Railroad
-Notorious (Atlantic) 475-194 Yannl-Live At The $\begin{array}{ll}\text { Acropolis (Private } \\ \text { Music) } & \mathbf{4 7 5 0 1 7 8}\end{array}$ Gerald AlbrightSmooth (Atlantic) 475-152 Richard Marx—Paid Vacation (Capitol)

Joshua KadisonPainted Desert Serenade (SBK) 4740791 Neal McCoy-No Doubt About it (Atlantic) 474.619

## . . . . . . . . . . . M More! (Interscope) 458-042

 Sweetly (Giant/Reprise)
Aaron Neville-The Grand Tour (A\&M) Dwight Yoakam-This
Time (Reprise) 4560913 Time (Reprise) 456-91 White Zomble-La
Sexorcisto (Getfen)
$\mathbf{~} \mathbf{4 4 2 0 0 7 9}$ The Benol//Freeman Project (GRP) 4744429 R.E.M.-Automatic For The People (Warner Bros.) 448.522 I Am (Warner Bros.)

Michael Bolton-The One Thing (Columbia)

Maverick"-Orig. Sndtrk. Featuring Clint Black, Vince Gill, more. (Atlantic Nashivile) 484*13
David Sanborn-
Hearsay (Elektra)
481.788
"The Fintatoues"Orig. Sndtrk.
Featuring B-5R's, Crash Test Dummies Us3, etc. (MCA)
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-Nuttin' But Love
(Uptown/MCA)
$478 \cdot 384$
Jackson Browne-I'm
Alive (Elektra) 4690783 10,000 Manlacs-MTV Unplugged (Elektra) Pantera-Far Beyond Driven (eastwest) $\mathbf{E}$ $\begin{array}{ll}\begin{array}{l}\text { Clay Walker } \\ \text { (Giant) }\end{array} & \mathbf{4 6 7 - 4 4 9}\end{array}$
467.449 Barry Manilow-
Grt. Hits (Arista)288-670 Nirvana-In Utero (DGC) $\quad 467+159$ The Cranberrles-
Everybody Else Is Doing Everybody Else Is Doing
It So Why Can't We? (Island) $465-559$

## Tom Petty \& The Heartbreakers-Grt. <br> "Threesome"-Orig. Sndtrk. (Epic/Soundtrax)  <br>  <br> "The Crow"-Orig. Sndtrk. Featuring Pantera, Stone Temple Pilots, etc. (Atlantic/ interscope) $\quad 4780230$ <br> The Black CrowesShake Your Money.

 maker (American)
## Alice In Chains-Dirt

 (Columbia) 445*833 Nell Young-Unplugged(Reprise)
$\mathbf{4 6 0} 972$ Little Texas-Big Time (Warner Bros.) $\mathbf{4 6 0 \cdot 2 0 4}$ "Sleepless In Seattle Soundtrax) Sndtrk. (Epic ${ }_{\mathbf{4 5 8}} \mathbf{- 4 3 0}$ ABBA-Gold-Greatest Hits (Polydor) 458*406 Toby Kelth-(Mercury/ Toby Kerth-(Mercury/
Nashville)
458.315 4 Non BiondesBigger, Better, Faster

Chant-The
Benedictine Monks of Santo Domingo De Silos (Angel) 477-067
"Aladdin"-Orig.

| Sndtrk. (Walt Disney |
| :--- |
| Records) |

Stone Temple PllotsCore (Atlantic) 453*0.4 Sade-Love Deluxe
(Epic)
$449 \times 439$ Phil Collins-Serious Hits...Live (Atlantic)

George Stralt-Pure
Country (MCA) 448e753 Country (MCA) 448-753 Vince Gili-I Still Believe In You (MCA) "The Bodyguard"Orig. Sndtrk. (Arista)
448-159
Kenny G-Breathless
(Arista)
4480142 Blind Melon Alan Jackson-A Lot About Livin' (And A Little Bout Love) (Arista)

Live-Throwing Copper (Radioactive) 478.362 | Beck-Mellow Gold |
| :--- |
| (DGC) $\mathrm{A76}$ |
| 12 | (DGC) E - $476 \cdot 721$ SireNarner) 485-185 Pearl Jam-Vs.

Entertaining
America...
One Person
ata Time.

五 informs me that most nopmal peape ny gge are actually down. dryving station wagno and buying dishes that arent plastic. Which translates inta: they don't play the saxophone at three in

 on Saturdays. If curise, he also thinths The Who is apart of an oid Abbott and Costello poutine, Red Hot Chilili Peppers are used for making tacos and Columbia House must be where they grind those tasty coffee beans. 99 (Epic) $4465 \times 427$ (Epic)
Aerosmith-Get $A$ Grip
(Geffen)
$4580^{*} 075$

Sarah McLachlan-
Surah McLachian-
Ecstasy (Arista) 473*389

66 he other day my dad

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| $28$ |  |
| Etor <br> (Polydor) |  |
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| "Dazed And Confused"-Orig. Sndtrk. (Giant) 468-546 |  |
| The Very Best Of Yes (Atlantic) 465-971 |  |
| Jimi Hendrix-The Ultimate Experience (MCA) 458~034 | Creedence Clearwater Revival-Chronicle-20 Grt. Hits (Fantasy) |
| The Allman Brothers Band-A Decade Of |  |
| Rod Stewart-Sing it Again Rod-Git. Hits (Mercury) 423-822 |  |
| The Very Best Of The Righteous BrothersUnchained Malody |  |
| Unchained Melody |  |
| The Moody Blues- | $5$ |
| Eric Clapton-Time Pieces (Polydor) 423-467 | James Taylor's Grt. Hits (Warner Bros.) 291-302 |
| John Lennon Collectlon (Capitol) 405-308 | Best of The Doobles (Warner Bros.) 291-278 |
| Lynyrd SkynyrdSkynyrd's Innyrds/Their Grt. Hits (MCA) 381-129 | The Steve Miller Band -Grt. Hits 1974-78 (Capitol) 290-171 |
| Grateful Dead-Skeletons From The Closet (Warner Bros.) 3780406 | Van Halen (Warner Bros.) 286*B07 |
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| Hits (Warner Bros.) 3750782 |  |
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| Journey's Greatest <br> Hits (Columbia) 3750279 |  |
| Steppenwolf-16 Grt. |  |
| Marvin Gaye's Grt. | Santana's Grt. Hits  <br> (Columbia) 2440459 |
| Hits (Motown) 367565 | Carpenters-The Singles 1969-73 <br> (A\&M) <br> 2360885 |
| $\begin{aligned} & \text { x-Classics, Vol. } 15 \\ & \text { M) } \end{aligned}$ |  |
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| The Mamas \& The Papas-16 Of Their Greatest Hits (MCA) 348-623 | SImon \& Garfunkel's Greatest Hits (Columbia) $219-477$ |
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| Hell II; Back Into Hell (MCA) $\mathbf{4 5 8 0 2 3 2}$ | Pretenders-Last Of The Independents (Sire/ Warner Bros.) 480-285 |
| Tina Turner-Simply The Best (Capitol) 433-342 | Chicago ${ }^{(8)-G r t . ~ H i t s ~}$ 1982-89 (Reprise) $401 \cdot 166$ |
| $\begin{aligned} & \text { Enya-Watermark } \\ & \text { (Reprise) } \quad 4310403 \end{aligned}$ | Aerosmith—Pump (Geffen) 388009 |
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| Red Hot Chili Peppers -Blood Sugar Sex Magik (Warner Bros.) E 428•367 |  |
|  | Bob Marley \& The Wailers-Legend (Tuff Gong/Island) 337-857 |
| U2-The Joshua Tree(Island) $\quad 354 * 449$ |  |
|  | Billy Joek ${ }^{(8)}$-Grt.Hits, Vols. 1 \& 2 (Columbia) 336*396/396*390 |
| AC/DC-Back In Black(Allantic)305045 |  |
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| Appetite For Destruction (Geffen) [ $\mathbf{3}$ 359-984 |  |
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Hits $1969-79$ (Polydor)

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tlon (Capitol)
$405-308$ Lynyrd SkynyrdGrt. Hits (MCA) 381-129 Grateful Dead-Skele-

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| Hits (Motown) | $\begin{array}{lr}\text { Styx-Classics, } & \text { Vol. } 15 \\ \text { (A\&M) } & 3640448\end{array}$ Best Of The Doors (ElThe Mamas a The Papas-16 O1 Their $\begin{array}{r}348-623 \\ \hline \text { Bad Company } 10\end{array}$ From 6 (Allantic)

Pretenders-Last Of
The Independents (Sire Warner Bros.) $480 \cdot 285$ 1982-89 (Reprise) Aerosmith-Pump REO Speedwago The Hits (Epic) 367067 Bonnle Raltt-Luck Of

Natalle Cole-

> NAME: Chris McAdams. PROFILE: Funiture Designer.

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## R\&B, DANCE, RAP

Outkast-Southernplayalisticadilacmuzik
(Laface) [ $\quad \mathbf{4 8 0 - 1 0 3}$ MTV Party To Go, Vol 4. Featuring The Red Hot Chill Peppers, TLC En Vogue, etc. (Tommy
Boy)
478.628 MTV Party To GO, Vol. 3. Featuring Jodeci, Boyz limyen, etc.
(Tommy Boy) $478 \cdot 610$ The Brand New (Delicious Vinyl) 478 Sister

The Best Of The Village People (Casablanca) $\mathbf{4 7 8 . 1 3 1}$ Angela Winbush (Elektra) 477•786 CeCe PenistonThought 'Ya Knew
(A\&M)
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Patra-Queen Of The
Pack (Epic) [3 $474 \cdot 809$
Zhane'-Pronounced
Jah-Nay (Motown)
Hammer-The Funky Headhunter (Giant
Reprise) 474.262
All Men Are Brothers:
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Mayfield-Various
Artists (Warner Bros.)

Aretha Frankin 15 Hits (Arista) 473.37 Jodeci-Diary Of A | Mad Band (Uptown/ |
| :--- |
| MCA) | En Vogue-Funky Divas eastwest) $\quad \mathbf{4 3 5 \cdot 7 5 0}$

Domino (Ral/Deflam
Chaos/Columbla) ${ }_{4} \mathbf{Z}$

## Queen Latifa Black Reign

Biack Reign
(Motown)
Haddaway
(Ariste)
471 -466

Us3-Hand On The Torch (Blue Note)

Shaqulle O'NealShaq Diesel (Jive)

Xscape-Hummin
Comin At Cha' (So So Det/Columbia) 469.981
Maze-Back To Basics (Wamer Bros.) $465 \cdot 716$
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$\begin{array}{ll}\text { Aar on Hall-The Truth } \\ \text { (Silas/MCA) } & 4684025\end{array}$

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(A\&M)

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(Mercury/Nash ville)

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| :--- |
| (Reprise) $\quad 476 \cdot 549$ | Night Music Clut (A\&M)

"Phlladelphia" Snditk. Featuring B. Springsteen, N. Young P. Gabriel, etc. (Epic) Soundtrax) $\quad \begin{aligned} & \text { (Epicd } \\ & 472.928\end{aligned}$

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Graceland (Warner
Blackhawk
$\begin{array}{ll}\text { (Arista) } & \mathbf{4 7 3 - 3 9 7}\end{array}$ Mariah Carey Music Box (Columbia) 465*435 Jimmy EuffettFrutcakes (MCA) Danzig-ThrallDeamonsweative (American)灵 462:333


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10 days for a full refunc and no further obligation - Bonus Offer: you rr ay take one more CD now at the super-low price cf $\$ 6.95$-and you are then entitled to take 2 more CDs as a bonus' To get your discounted CD and 2 bonus CDs, iust enclose an additional $\$ 6.95$ (shipping and handling on all 3 will be billed)-and you'll receive them with your 9 introductory selections--that's a dozen CDs In all.
- If the application is missing, write to: Cotumbia House, 140 N North Fruitridge Avenue, Terre Haute, Indiana 47811-1 130 .

Speaking of speakers-if you were around circa 1936 (most of our readers definitely were not) you could have acquired a mammoth high-end loudspeaker system already built into an impressive floor-type radio console, much as we buy "built-in" speakers today in their own enclosures. Indeed, there were numerous such models and different brands. Example: An 18 -inch frame and a cone 16 inches wide, with what amounted to midrange and tweeter units built right into its center, a configuration widely known later (after World War II) as coaxial. Another system, the biggest and most expensive, featured a separate 18 -inch woofer, two 12-inch midranges, and no fewer than three tweeters (as we now call them). Imagine the size of that radio console. It came from Crosley, and it sported 37 tubes. It would take the ever-proverbial Mack Truck to move it.

All of these big speaker systems were housed in massive radios that somehow managed to look remarkably like model skyscrapers-soaring vertical lines with a solid foundation at the bottom and an art deco rounded upper portion where the controls were located. ("Art deco" was not then the term for this, of course-streamlining was the appropriate word, for everything from skyscrapers to refrigerators, their surfaces curved and shaped just like high-speed streamlined trains.)

The given specs for these astonishing pre-hi-fi radios were equally impressive, and they may seem hard to believe for those who were born later. A claimed tonal range,

RADIOS OF MY YOUTH
SOMEHOW MANAGED TO LOOK REMARKABLY LIKE SKYSCRAPERS. for instance, from 20 Hz to

25 kHz ? Definitely! Except that for practical broadcast reception (AM) this top was cut back to a mere 12 kHz or, in normal terminology of

## SKYSCRAPERS IN YOUR LIVING ROOM


that time, 20 to 12,000
cps. That model came from Crosley and had the 37 tubes. This, mind you, in a period when the newly popular radio or phonograph generally produced sound with a top no higher than 4 to 5 kHz , and often lower. High end indeed! We had it from the middle 1930s right on until the Big War.

This and, as the ads say, much, much more, is not merely out of my
own anclent memory. I have confirmation, kindly sent to me by a reader, Stephen Ickes, to whom I extend profuse thanks even if I do not have his address. (On the envelope, probably, which I threw out automatically.) Mr. Ickes sent me copies of four pages from 1936 and 1937 radio magazine material, not only with pix and general specs but in one case a complete circuit diagram, guaranteed to make those who can read in vacuum tubes (rather than chips and boards and transistors) sit back and take a long, long breath. (I'm sending a copy to our Technical Editor Ivan Berger, so he too can take a breath.) Do I mean Illustration: Heidi Stevens


4
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Enjoy the ride...

## ABSOUUIZY STATE OF THEART 

OF YOUR MOBIL AUDIO SYSTIM.
five or six tubes, or eight, as used in current tube-only models? Get ready: These high-end radios boasted from 18 to as many as Crosley's 37 tubes!

From Ickes' fascinating set of pages I could outline for you-given most of an Audio issue-no less than three competing console models from 1936. These three radio skyscrapers instantly brought back to me the feeling of awe that these beautifully designed machines-outside as well as in-side-created for us in that distant time. Majesty is the word that comes to mind. To
my eyes, then as now, they were majestic examples of advanced technology, to grace, and even overwhelm, anybody's living room. (That is exactly what the ad pictures show.)

Best of all, for me, in this excursion into radio's high-end past there is a full-page ad for-you guessed it-ihe Midwest radio. You will recall that only a couple of years before 1 had fallen hard for the then-current Midwest model, sold only by mail order, and was immensely satisfied with its performance. That one had 16 tubes-the

Tas is famous for sneak previews and mini-reviews that never turn into full reviews, and I hate to break a great tradition. I do feel, however, that I should follow up on my initial comments on the Wireworld Eclipse interconnects [Issue 83/84] and speaker cables to the point of confirming my original praise.

I have now worked extensively with the Wireworld Eclipse phono interconnect, RCA interconnects, balanced interconnects, Starlight digital interconnects, and speaker cables.

The net result confirms my initial impressions. The Wireworld Eclipse cables have proved to be reference quality products that have integrated smoothly in connecting up both an entire reference system and in connecting all of the 30 -odd components I have had in for review since I started using them. I have found them to be fully compatible with every component I have tried, and I have found them to be extremely revealing without exaggerating any aspect of sonic performance, or producing the kind of false insights into the music which later tum out to be coloration.

The Wireworld Eclipse interconnects and speaker cables not only reveal the music that is on the recording, they reveal the full capabilities of all types of equipment. They have proved to be of great value in making detailed equipment comparisons. They have not always been the best interconnects or speaker cables in connecting specific electronics or speakers, but they have been competitive, and they have usually been superior.

## "THE ONLY

 WAY I KNOW TO PASS ON INPORMATION IS PURE, UNFILITERED ANDUNALTERED."<br>DAVID SAlz

Anthony H. Cordesman For the enaire review, see the absatute emand issue 95
model depicted here has 18. To my pleasure, everything else I remember is still right there. It has a "giant" speaker, no size given but obviously it was the then-standard electrodynamic with extra-large power supply and awesome volts and amps. Yes, it has the same short-wave capabilities that I described, which brought Nazi Germany and Hitler himself into my college room, night after night. Six wave bands, $41 / 2$ through 2,400 meters. "Amazingly selective, delicately sensitive, it brings in distant foreign stations with full loud speaker volume on channels adjacent to powerful locals." The advertising is not hype-it is

## I COULD OUTLINE THREE 1936 CONSOLE MODELS

$$
\begin{aligned}
& \text { FROM A READER'S } \\
& \text { RECENT DISPATCH. }
\end{aligned}
$$

precisely what I remember in my own Midwest, as already described, even if the rest of this account waxed a bit hysterical: "You'll thrill over its marvelous super-performance . . . glorious crystal-clear 'concert realism' . . . magnificent world-wide foreign reception."

It had gadgetry, too, this later Midwest. Dial-A-Matic, 10 "perfectly tuned" stations, just like a telephone. Something called Electrik-Saver which cuts radio wattage consumption $50 \%$, uses no more current than a 7 -tube set and-note this"enables you to operate on as low as 80 volts." That's interesting. Twice in the last month my 1994 power has dwindled to one half the line voltage, region-wide, leaving us with faint, dim lights and heavy equipment at deadly risk, until the other half was cut out. My audio and typewriter were already pulled from the wall, but I had to rush around disconnecting the refrigerator, deep freeze, and so on before they could try to start on maybe 60 volts. How much of our a.c.-powered gear today will run safely on half voltage? Only those items with battery chargers and rechargeable batteries, I would think.

There is an amusing payoff to this Midwest story. The Midwest company, starting way back in 1920 at the dawn of radio in the home, was a pioneer mail-order outfit,

AUDIO/OCTOBER 1994
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SPECTACULAR SOUNDSTAGE!
By replacing the conventiona Rotary Switch with Analog Transmission Gates for input selection, we have done far more than improve reljability We have accomplished a significant sonic improvement, beceuse Electronic Switching avoids bringing all inputs from both channels into close proximity, which reduces Crosstalk and vastly improves Channel Separation (greater than 100 dB ).
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DIGITAL INPUTS Yes the 940 can be configured with Direct Digital inputsy with the optiona 20-bit. 8 times oversamplirg DAC module, providing both coax and optic inputs This is the same converter module which is the heart of our highly acclaimed models 300 and 900 off board DACs.


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from factory direct to consumer. That made its products much cheaper (as pre-sent-day mail-order buying makes things more expensive!), a big factor in my own Midwest buying, back in my unopulent college years. How much, then, around 1936 or so, would you have put out to acquire the 18 -tube Midwest model with the "giant" speaker? You will not believe it. The price, in large visible numbers, is $\$ 59.50$.

Some things, however, never change. Yes, you could have, and I quote, "terms as low as 104 a day," plus 30 days FREE trial.

And a year to pay up. Wow! We could use those terms now. But beware-there is small type, just under the price: $\$ 59.50$ (less tubes). As I say, some things never. . . . Now how much extra would it cost for the 18 tubes to go in all those empty sockets? You guess. Still, a bargain even with tubes added. Betcha I had to buy the 16 tubes extra for my own Midwest. Don't remember.

To be sure, these fancy machines of the 1930s were in effect custom jobs, handmade, and unknown to the general public with its growing millions of cheapie radios

## The Panamax



$P_{\text {eac }}$
leace of mind can make all the difference when it comes to enjoying your home entertainment investment.
"The main advantage of this unit is that it is very effective in filtering out noise that can get into your system from the A.C. power line.
The MAXe 1000 will also protect your valuable audio and video components from damage that can be caused by line surges or even lightning.

> Edward E. Long, Audio Magazine, June 1993

MAX®1000 is covered by the Panamax Lfetime Product and Connected Equipment Warranty. See warranty for conditons, limitations and claim procedures.

## MAX®1000 FEATURES INCLUDE:

- Master On/Off switch controls power to the "Switched "\& Delayed Turn On' outlets.
- 8 AC outlets provide continuously monitored, filtered and protected power.
- 2 unswltched "Always On" outlets.
- 4 unswitched outlets provide AC power for the system accessories.
- 2 "Delayed Turn-On" AC outlets with 10 to 15 second delayed start-up/shut-down prevents amplifier "thump"
- AC master control power-sensing cable connects the MAX $\oplus 1000$ to the system.
and radio phonographs. Until the Midwest came my way, it was a totally unknown area for me; my "speed" was as already described, from a dreadful a.c./d.c. portable (large and heavy) in my freshman year at college to the several RCA consoles noted a few months ago. As to prices, just multiply 10 to 15 times or more and you will understand that these 1936 high-end babies weren't so cheap in our then large-size (lit-erally-much bigger than those today) dollar bills. The Midwest was undoubtedly the lowest in price. Others ran much higher, including Scotts, Fishers, and that Crosley, which probably took the financial cake.

To put the pre-war hi-fi into a bit of perspective, there were other developments that early which were part and parcel of state-of-the-art audio long before that name was widely used (not until after

## HIGH-END RADIOS OF THE MIDDLE '30s BOASTED FROM 18 TO AS MANY AS 37 TUBES!

World War II, as in this magazine and the Audio Engineering Society). FM may seem today a fairly modern alternative to stillexisting AM broadcasting, though not as static-free nor as noiseless as it might be thanks to compromises for stereo transmission. Major Armstrong launched his mono FM, uncompromised and super-fi, also during the ' 30 s, with ultra-high broadcast power as a rival to the existing AM networks. It was radio war almost to the death and the Major lost his bid for a new national FM hi-fi network distributed via microwave, even though FM survived, barely, You may remember that when FM got started he was particularly careful to supervise, on the spot, the design and manufacture of the speakers that would go into FM sets. The quality he got from them and from uncompromised FM circuitry was astounding, easily matching our best today.

That FM sound was my own heady introduction to high-end audio, only a handful of years after those fancy radios of the middle 1930s. A time of remarkable preaudio excellence!

# "Bought expensive speakers? ...Better not listen to these." 

## POLK AUDIO'S LS90

## HIGH PERFORMANCE LOUDSPEAKER

"I never believed you should have to pay audiophile prices to get audiophile quality sound. So instead of just putting together a collection of expensive parts, I began researching the root causes of performance loss in loudspeakers. Out of this research came groundbreaking technology, Dynamic Balance, and our flagship, the LS90 loudspeaker. With audiophile quality sound at an affordable price, the LS90 is so good that if you just bought expensive speakers, you'd better not listen to these." Matthew Polk

Other experts agree, like Anthony H. Cordesman, Audio Magazine's respected critic. He wrote, ". . . the LS90's midrange is exceptionally detailed and exceptionally smooth... has an exceptional ability to resolve complex dynamic passages and the softer passages


The 1590 is ovailoble in ook, black pointed ook veneer ond high gloss rosewood lominate. of orchestral and choral music. . . precisely the kind of full-range speaker that today's buyers need. It offers the sound of highend quality at an affordable price."

For more information on the LS90, the LS Series and LS home theater, call 1-800-377-POLK. Or dial our toll-free dealer locator to find your nearest authorized Polk Audio dealer. Audition the LS90 loudspeakers . . that is unless you just bought expensive speakers.

## poluemoto

## MONDO AUDIO

## KEN KESSLER

## BRAZIL: 1, CES: 0

Arms waving to clear away the unsettled dust, I'm struck by the chaos following the Summer Consumer Electronics Show. Allegedly the last to be held in Chicago, it has inspired the usual half-full/half-empty responses, depending on the person to whom you're speaking. They'll be arguing about it until, oh, January at the soonest. That it wasn't a"no. That it wasn't a" success is a consensus: It was a fullblown fiasco. But
rolls of film, schlepped a five-inch pile of brochures back to my hotel room, and wrote for six hours. So far, so typical.

But it was such a gloomy show, and not just because we in the hi-fi community had to rub shoulders with that lowest of life forms, soccer fans. The World Cup took over Chicago, with those stupid little football logos
waste of time) had so little to distract them that they spent long, uninterrupted periods in every room. As a result, those vending their wares to retailers and distributors were able to make their pitches without interruption. The press, too, was handled without haste.

It was exactly what you'd expect of a "normal" CES if a normal CES lasted 10 days and everyone had the time to take more time.

But was the show reduced in size only because everyone knew it was the last Chicago event? Was there some industry buzz which made the regular attendees stay away, and which convinced manufacturers not to exhibit? Time for a little history lesson...without touching on the destruction that Nintendo and MTV stand-alone entertainment format.
have wreaked on music's
status as a viable,
have wreaked on music's
status as a viable,

does it reveal any weaknesses on the part of the hi-fi community? Did the high-end disgrace itself? Is audio (small "a," please note . . .) dead?

I can't complain about the short-ened-to-three days Chicago show because a CES has to meet only one criterion to justify its existence for my purposes: It has to cough up enough new material to fill a show report. Even in its truncated, 60room form, the Hilton held enough new, pure hi-fi products to provide the requisite 5,000 words for my employer back in England, Hi-Fi News o Record Review. I shot my 10
everywhere you looked. CES itself was simply bleak, with whole floors in the Hilton bearing as few as two exhibitors. The hotel's bar was nearly as empty as its corridors. And yet those who did exhibit were uniformly happy because the retailers, distributors, and journalists who bothered to attend (despite preshow cautioning that it would be a

Chicago has hosted the Consumer Electronics Show for over a quarter century. The city was/is in many ways ideal for conventions because it is centrally located (relative to the rest of America), there are plenty of hotels of all types, some truly great restaurants, many classy diversions and, of course, enough continued on next editorial page


Over the years critic's have praised the remarkable performance of Paradigm speakers and have hailed them among the very best available! Built on a strong tradition of design excellence Paradigm is now one of the most highly acclaimed speaker brands, with countless rave reviews and numerous Critic's Choice and Grand Prix Awards.


Paradigm continues to advance state-of-the-art design
in an unfailing quest for ever more convincing musical and home theater performance. The results speak for themselves... just listen to what these respected reviewers have to say:
"This is a true high end speaker at a quite astonishing price... thero'e litarally nothing else In the market at anywhere near the price... which combine this level of sound quality, accurtey, and wide, smooth frequency response..."
Audio Ideas Guide on the Esprit/BP


The Sensible Sound on the 5 seMk3

Then there is the question of value. This is more than just subjective impression. Real value is based on sound performance and build quality, and Paradigm simply gives you the very best of both! In fact, Paradigm has once again been rated \#l for value in surveys conducted by the trade publication Inside Track*.

So read the critical acclaim, the praise, the plaudits, and listen for yourself... then you will understand why the critic's agree!


## Titan

"Calling this speaker 'Titan' is not as extravagant as one might think - it is truly a giant-sized value."
'... it does such a skillful job... that the listener does not notice that all of the music is coming from the pint-sized Titans."

Stereo Review
"... a match for some speakers that are twice the size (and price)... the frontrunner in this market niche."
"... the Titans... represent real value for money - an ideal first step on the hi-fi ladder."


## Phantom

"... an amazing level of performance... effectively competes with speakers close to twice its price..."
"... any budding audiophile assembling a system with an under- $\$ 1000$ budget would be foolish not to audition the Phantom."

Audio Ideas Guide
"The smoothness of the Phantom's frequency response would do justice to speakers at ten times its price... unquestionably an outstanding value."
'"... this speaker is the best by far!' At this price level, that's remarkable indeed."
'".. as good a value as you will find in today's market.'

Sound \& Vision
SoundeVision
AWARD

## 3 seMkII

"The 3 seMkll is a superbly balanced design that combines just about as much accuracy, dynamics and bass extension as you can get at this price."
''.. this speaker showed very good neutrality... good depth on choral music, and a quite open sound."
"Percussion and rock music were very dynamic, and the 3seMkll will play quite loud without stress."
Audio Ideas Guide
Soundeavion
AVARD

## 7seMk 3

'The 7seMk3 is obviously an excellent choice... offering performance comparable to many in the $\$ 1000$ range."
'... nicely quick and silky character from the tweeter... good clarity... excellent soundstaging and depth... natural tone..."
"I also liked what other writers have called 'the ability to boogie', a lively rhythmic presentation that gives rock and jazz music a real impetus."
Audio Ideas Guide
SoundeVVision
AWARD

## Studio Monitor

"This is a true monitor loudspeaker."
"... a quite notable value among higher priced speakers."
Audio Ldeas Guide
"The [Studios] exhibited an open, spacious, clean sound, with excellent soundstaging and powerful bass capacity."
"Does the Studio Monitor meet its goal of keeping up with the big-guy, highend systems at only half the price? You bet! Check them out for yourself!"

Audio Magazine
SouxdaVision
AWARD


## Home Theater

"I found the sound of both Titan and Atom based systems very clean and dynamic..."
"The excellent dispersion of all models makes listening well off axis, especially with a centre channel, little problem, with good stereo and surround imaging always apparent."

Audio Ldeas Guide
"For the price - or even double - it's hard to beat..."
"... the various combinations of Paradigms sounded very good whichever way we set them up."
Sound \& Vision
SoundeVision.
AWARD

## "BRAVO"

"The Titan would be absolutely fantastic in any role: main, surround, and/or dưalgęhänniel center."
"...these speakers offeir so much value, it's scary."
"Sonically, the Titans' balance was nearly perfect, and detail was excellent."
"Their bass was great, too... Power handling in the face of overload was superlative."
"... twó audiophilé friends... ranked my six finalists in this order (from most favorite to least favorite): Paradigm..."

Technology can be a wonderful thing. I'm not talking about the down-and-dirty technodes, like injectionmolding techniques and the glories of military-spec capacitors. I'm talking about how technology can make our lives better. Consider that only 5 or 10 years ago, you were in serious trouble if you had to buy a small pair of speakers. Only a few of the hundreds available delivered sound that could be honestly characterized as hi-fi, and they were often exorbitantly expensive. We suspected that that just wasn't the case today. So we designed a full-bore comparison, assembling a cast of 20 name-brand speakers with suggested retail prices of $\$ 250$ or less and pitting them against one another, mano a mano, in a fight to the finish. While we noted special applications along the way, our goal was likely your goal: to find which ones sounded the best. Our findings for each speaker follow: procedures, comments (including definitions for terms used in the reviews), and our bottomline conclusions.

## The Paradigm Titan

The Titan, a Canadian entry, looks like your average mini bookshelf speaker. "Average" doesn't belong in any sentence describing its sound, though. Sonically, the Titans' balance was nearly perfect, and detail was excellent. Their bass was great, too, though they did get a little boomy and boxy at very loud listening levels and in some placement configurations. Power handling in the face of overload was superiative. Measurements revealed that the Titan's frequency response dropped down to the benchmark for this group ( 60 Hz ), and its output at 100 Hz was on a par with the higher frequencies - unlike most of its competition, whose overall bass output was usually several decibels below the rest of the spectrum. On-axis, this flatness extended out to $10,000 \mathrm{~Hz}$, after which response increased considerably. Off-axis response was outrageously flat - within $\pm 2.5 \mathrm{~dB}$ between 200 and $16,000 \mathrm{~Hz}$ ! The Titan would be absolutely fantastic in any role: main, surround, and/or dual-channel center. Bravo.

## The Bottom Line

Speaker technology has advanced to the point where small, affordable models should deliver truly excellent sound. Getting big sound out of small speaker boxes is especially important during the home-theater boom. A home theater asks us to lodge at least four, and preferably six. speakers under our roofs. The standard lineup includes two "main" speakers (the left/right pair that plays music in a basic stereo setup), a center-channel speaker, and two rear "surround" speakers. Some high-end home theaters, particularly those built around a projection TV, employ two center speakers - an issue here since the vast majority of inexpensive speakers (excepting most dedicated centerchannel speakers) are sold only in pairs. And most bona-fide home theaters also have one or two subwoofers, which produce low bass that's beyond the capabilities of the mains. In any case, if most of those speakers can be small, so much the better. And if they're inexpensive, the entire prospect of building a home theater is that much easier.

Note that a center speaker, which is generally placed on top of a TV set, should be "shielded" or it will interfere with the TV's electronics and distort its picture. This isn't a requirement with front-projection TVs, since their electronics aren't anywhere near the screen, and it might not matter with a rear-projection set either. When in doubt. simply rest an unshielded speaker on top of the set and see what happens. The main speakers need to be shielded only if you plan to place them right next to the set.

Whether you're looking for speakers to serve in a home theater or simply need a pair for listening to music, the requirements really are the same: The speakers must sound accurate and natural. A voice should sound like a voice, whether you're enjoying David Letterman's "new" show, a CD of Eric Clapton's Unplugged, or Michelle Pfeiffer in Batman Returns; a cannon should sound like a cannon, whether it's punctuating Tchaikovsky's "1812 Overture," John Wayne's The Alamo, or an episode of $F$. Troop.

To find out whether these speakers truly were capable of serving our home-entertainment needs, I spent many hours listening to each pair individually and conducted head-to-head comparisons. Finally, 1 selected six finalists that stood at least a

full head - if not head and shoulders - above the rest. Arranged alphabetically, the finalists were the B\&W Model 2001, Celestion's Model 1, the KEF K-120, Paradigm's Titan, the Phase Technology Model 335ES. and PSB's Alpha. Then 1 asked two audiophile friends, whom I"ll call Siskel and Ebert, to participate in a top-level shootout. The finalists were artanged in symmetrical pairs on two small tables, wired to a rotary selector, and concealed by a piece of acoustically transparent cloth. Siskel and Ebert listened at leisure, making notes regarding performance in the four subjective categories on independent scorecards, as 1 followed their commands to switch from one pair to the ot her.

When they were done, I unveiled the speakers ... and watched their jaws drop. Both were flabbergasted to learn that the priciest speaker in the group cost $\$ 249$ a pair. Siskel thought he'd been comparing models costing $\$ 1,000$ a pair; Ebert said he'd had no idea that so little cash could buy such terrific sound.

1 couldn't agree more. Virtually all of these speakers offer so much value, it's scary. From now on, you shouldn't be surprised when a company comes up with a great-sounding speaker at a reasonable price - and there is no good reason to buy a bad-sounding speaker at any price.

For the record, Siskel ranked my six finalists in this order (from most favorite to least favorite): Paradigm, PSB, B\&W, Celestion, KEF, and Phase Technology. Ebert saw it this way (ditto): Paradigm, PSB, KEF, B\&W, Phase Technology, and Celestion.

While many of these speakers would make terrific mains in a home theater, you should definitely pair the set of your choice with a subwoofer if you want to take your system to the next level. While the best of this group had response reaching down to 60 Hz , they all really need help below about 100 Hz if you want to get all of the impact you'd expect out of a topnotch home theater. If your budget prevents you from getting a subwoofer right away, you can always rely on the mains for now and add the sub later. The best speakers in this group are so good, you won't mind the wait.

Tom Nouisane

## Home \& Studio Recording

Small near-field loudspeakers often play a crucial role in the making of hit records. What makes a desirable "near-field" monitor? Is one monitor better than another for all applications? Do all recording engineers need starkly accurate monitors or do some prefer artistic coloration? Our extravaganza takes a close look at 14 modern near-field designs and evaluates them blindly, objectively, subjectively, and in comparisons.
Our aim in this ambitious endeavor was to make a realworld working assessment of typical meter bridge mounted speakers using commonly encountered program material. Save for an SPL meter, we will use no test equipment. Domain analysis and impulse graphs cannot substitute for a collection of experienced ears. And. yes, we are quite aware of the non-scientific nature of our test

## The Test

Again, we limited our test to passive two-way designs with 7 " or smaller woofers retailing for under $\$ 1000$. Speakers were positioned behind a $15^{\prime}$ wrap-around veil of black grille cloth. Unless otherwise directed by manufacturer's instructions, ofiset tweeters were placed "in" towards center, grille screens were removed, and cabinets were positioned vertically, on-axis to listener in a $4^{\prime}$ equilateral triangle over a Trident 80 B console surface.

Test audio was played to assure correct L-R and phase. Pink noise was then generated at $-12 \mathrm{~dB}(\mathrm{VU})$ and the Parasound amplifier adjusted for nominal 88 dB SPL ('A' weighted at listening position) with precise image centering. Participants were shown the sweet spot via strips of white tape; each was allowed five minutes per speaker. listening to all musical samples at least once. Average musical levels were measured between 70 and 95 dB . with a maximum peak at 102 dB (typical near-field studio listening levels).

Our test panel consisted of five audio engineers, four of whom judged bindly. I was the fifth participant. facilitating the set-up of each speaker in a random order. While the majority of my work is divided between classical music production and pro-audio product design, the other participants are involved full-time in the production of mostly contemporary music (pop, urban, etc.). Hence, all conclusions in this roundup are based on our unique experiences, expectations, and sonic requirements. If the participants were. say, all classical music engineers, scoring would certainly have developed somewhat differently.

Panelists were asked to evaluate each speaker using two methods. The first looked at six sonic parameters, scoring between I and 10 for each parameter. Half scores were acceptable (e.g., $\overline{7}^{1 / 2}$ )

1~ Low frequency quality
2~ High frequency quality
3~ Overall aceuracy and limbre balance
4~ On-axis imaging
5~ Off-axis imaging
6~ Personal preference, irrespective of other tests

While these six parameters reveal a great deal. they don't allow for subjective assessments. Audio engineers commonly use adjectives like "bright," "thin," or "clear" to describe a speaker. For this reason, our lest also included a 2 pole subjective scale based on the findings of acousticians Gabrielsson and Sjogren. Participants circled the number closest to their "fee!" of each speaker:

| 5-4-3-2-1-0-1-2-3-4-5 |  |
| :--- | :--- |
| Soft | Hard |
| Bright | Dark |
| Full | Tbin |
| Spacious Constricted <br> Clear Veiled |  |

Acousticians have found that loudspeakers appearing most true to nature are commonly described as "clear, soft (at least not too hard). full. and offering a feeling of space."

## Paradigm Mini Mkll

The Canadian government has funded a large ongoing research project to learn more about high performance loudspeakers. Paradigm is one beneficiary of this research. And judging from our test results, they have done their homework. Though placing just average in on-axis imaging, four of five panelists scored the Mini MkII as one of the two most overall accurate speakers tested. In HF quality, the Paradigm shared top honors with Audix [\$599] and Icon [\$995]. And in the rankings of personal preference, Paradigm placed second.
Comments included "Good balance, nice ambiance, needs deeper LF." Subjective ratings placed Paradigm solidly into categories of fullness, clearness, and spaciousness, with moderate softness. Paradigm and KRK [\$1095] were the only two speakers tested that received at least three excellent ratings in all six categories. After noting the price, participants agreed that the Paradigm is an outstanding value in a nearfield production speaker.


## "OUTSTANDING"

"... participants agreed that the Paradigm is an outstanding value in a near-field production speaker."

## "...four of five panelists scored the Mini MkII as one of the two most overall accurate speakers tested."

"In HF quality, the Paradigm shared top honors..."
"Comments included 'Good balance, nice ambiance...' "
"Subjective ratings placed Paradigm solidly into categories of
fullness, clearness, and spaciousness..."

# "SPECTACULAR" 

"...this is no ordinary loudspeaker."

"No other speaker I have<br>heard, at or near the price, renders so much authenticity to the music."

I am hard-pressed in recent memory to think of another dynamic loudspeaker which is as convincing as this one."

"At times the music seems to glisten, as if more improvements were made to my audio system than just the speakers."

"Bass performance from the 5 seMk3 is nothing short of spectacular."

5 seMk 3 is nothing short of spectacular. This is not the kind of low-frequency output that one would expect from an enclosure of such meager size. Compared to its predecessor, the Mk3 appears to reach down almost another octave. As a full-range transducer, then, the Mk3 is far more convincing than its predecessor. I should point out here that the Mk3's initial auditioning took place in my larger-thanaverage living room which can swallow whole and render impotent many a speaker thought to possess much testicular fortitude.
My first thoughts on this--that the speakers may be a bit botom-heavy in average rooms--were dispelled when the Mk3s were set up in the home where the stacked original 5 ses reside. In this more normal listening environment the speaker was no more or less well-composed. It retained its neutral character throughout most of the audio spectrum, further affirming for this reviewer the level of acumen and expertise dedicated to the 5 seMk3's design.

Its bass perfornance points to an attribute that makes this speaker unique. The 5 seMk3 absolutely attaches significant new meaning to the use of the word "accurate" in describing any piece of audio gear. So accurate is this speaker that differences between two preamplifiers, for example, that may seem subtle on many other speaker systems are blatant on the 5 seMk3. This, for most Musicophiles, is truly a blessing, as it enables the listener to identify sound-quality differences between components readily, and tailor exactly the kind of sound he/she prefers. In my 24 years as an audiophile, there has never been another speaker in my experience that can show these kinds of differences quite so acutely. The quality of bass response down to the speaker's limits are, thus, dependent on associated components' capabilities as they should be, and not a reflection of the speaker's character at all.

I used three different amplifiers with the Paradigms: two Quicksilver MS-190 tube amplifiers (one operating triode, the other pentode), and an Eagle transistor amp in its last edition. I also tried a variety of preamps, CD players, and a turntable that helped me to come to my ultimate conclusions about the 5 seMk3's accuracy. Make no mistake about what I am saying here. Down to its bottom limit, this Paradigm speaker offers performance few others can match at its price, while imposing less of its own character on the sound quality one ultimately hears. Those who are familiar with "Follow Me Home" from Dire Straits' Communiqué, or the synthesizer that opens "Telegraph Road" from their Love Over Gold, will be bowled over by the 5 seMk3's ability to articulate so resolutely the delicate changes in both tone and dimension found here. When associated components are capable of producing the extremely transient bass of some recordings, as in many parts of Reference Recording's Dafos, the 5 seMk3 provides an accurate portrayal of the ambiance sumfounding the bass, as well as a lucid representation of the original sound. There is no detectable bloating or overshoot here, only a vividly produced replica of the original "thwack." In this regard, I consider Paradigm's efforts to be most commendable. In a perfect world, this speaker's bass would reach down to 10 Hz with no change at all to the way it sounds overall; in the real world Paradigm is offering bass quality that this reviewer has heard heretofore only rarely.

The Mk3's departure from the original 5 se is not quite as startling in the midrange, where the original's character swas quite good. Although both retain much of the same sweet sonic nature, the Mk3 again shows its ability to impose less of itself on the overall sound than most other speakers I have heard, including the original 5 se. 1 found the original 5 se to have a bit more warmth than I like in the upper midrange compared to the Mk3. The Mk3 is electrostatic-like in the ways that I consider the finest electrostatics to set the standards for music reproduction. Here, transients sound especially lifelike, and although some very minor coloration
ear, appreciably raising the image height the speakers can produce. Another benefit of raising the speakers is that it decouples the speaker from the floor, and adds another level of clarity to the speakers' bass outpuc. I built stands from materials I bought at my local Hone Depot for less than $\$ 30.00$, which included two pieces of $12 \times 9.5$ inch particle board, eight 6 -inch parsons table legs that were screwed into the botlom of the particle board, and some weather stripping that isolated the speaker from the stand. Adding a little black paint and some sandpaper would make these stands appear as if they came with the speakers. Whether or not the speaker will need these stands depends on individual preferences, of course. Paradigm has provided screw-iri receptacles for those who wish to add tiptoes to the speakers.
On their own, a single pair of 5 seMk 3 s can afford the kind of music reproduction that previously tais been possible only from speaker systems costing many times their price, but there's more. Earlier in this review, I Ekened stacked pairs of 5 seMk3s to the big Infinities, but this is not altogether irue. As impressive as the Intinity IRS Betas can sound in a friend's listening room, I have never heard them provide the level of coherence that flows from the Paradigms with ease Because stacked Paradigms don't demand the exacting spatial relationship between the woofer tower, and the midrange/tweeter panels to minimize sonic anomalies that often come from the far more expensive Infinities, the Paradigms seem more natural; and because the stacked 5 seMk3s actually provide more of a point source their image is never bloated or staggered as I have often heard it sound from the Betas. True, the Betas' bandwidth is somewhat broader, but at a considerable cost. I like to think of stacked Paradigm 5 se Mk 3 s as a poor man's IRS Beta. Before the reader writes this off as folly, I invite him to try this exercise himselfi.

Readers whose audio interests span the last 20 years or more may recall the fad of stacking Advents that raged in the early 70's. I remember visiting a dealer in Florida who had furthered the stacking idea when he introduced a multispeaker system called the HQD that used a pair of Hartley sub-woofers, two pairs of stacked Quad electrostatics, and a pair of Decca ribbon tweeters. While these attempts at producing better sound by doubling $m$ on speakers have their place in the annals of audio oddities, they don't begin to match what one can hear with stacked Paradigms. If your tastes run toward music at live levels, then be prepared for a real tieat when you hear the 5 semk 3 s in a stacked configuration. Stacking these speakers produces a tall slender column just over 6 ' high (including the stands), which just isn't very appealing to the eye, and on thick carpeting could cause a bil of a swaying problem. Overcoming these obstacles, though, is well worth it. The net effect of stacking two pairs of the $5 \mathrm{seMk3}$ is an overall enhancement to all of the speaker's greatest strengths. There is one other benefit from stacking this Paradigm that is worth noting, and that is that tweeter performance seems to improve remarkably While I would like to spend more time on this subject, I realize that few readers would be disposed toward stacking any speakers

I'll conclude this rather lengthy review with a recommendation to consider strongly the Paradigm 5seMk3. No other speaker I have heard at or near its price renders so much authenticity to the music. Twe stacked pairs sound even better. The speakers appear to work well with both rube and transistor amps, although the panel suggests the 5semk3 is one of the few dynamic speakers that sounds better with tubes. This is an excellent loudspeaker that will provide much improvement to, most listeners' audio systerns. At its price the 5 se Mk 3 is a bargain

SGB

The Sensibit Soxract 403 Darvin Dr. NY /4226 ar phane 200605:8439

## "CONVINCING"

"... a degree of mid-toupper midrange clarity that ¢trips away several veils to reveal a level of inner detail that I must, again, compare to speakers costing more than ten times that

# "... this Paradigm <br> conveys a musical autharity uncommon in all but the most expensive speakers." 

of the 5seMk3."

> "I find myself a bit lacking in the abillty to bestow the sort of praise this speaker deserves."

What ultimately piques my disappointment in the 5 seMk3's highest frequencies, though, is its lack of highfrequency extension, and its modicum of imritating distotion as the tweeter approaches its upper frequency limits. I experimented with a myriad of speaker placements in the large listening room to find the point at which I could maximize treble performance yet maintain its bass and midrange fluency. I have determined that this minor problem, which shows itself as a papery dryness at frequencies above 14 kHz , is the one area Paradigm needs to work on in its subsequent editions of the Model 5. As it exists, the 5 seMk3 will need to he mated with amplifiers that lean toward the liquid side in order to minimize this dryness for the reader to hear the kind of stunning performance this review describes.
A single pair of 5 seMk 3 s performs optimally on the long wall of a decidedly rectangular room. The speakers need to be as far away from side and rear walls as the spouse will permit to negate speaker/foom interaction. In my $23^{\prime}$ by $19^{\prime}$ living room, I found the 5 se Mk3 sounded hest when it sat about 6 away from both the side and rear walls, allowing a distance of 12 between the speakers. The optimum listening position is just short of the imaginary third point of an equilateral triangle. I suggest that using a similar ratio in smaller rooms will afford the listener excellent results.

I also found that by elevating the speaker approximately 7 " off the floor, the tweeter is closer to the same plane as the
is apparent in the lower midrange, it is neither distracting nor quite as obvious as one might surmise from this report. This coloration masks rather than exaggerates the lower regions of the human voice, which would be a positive property on many recordings.

I am hard-pressed in recent memory to think of another dynamic loudspeaker which is as convincing as this one. The NEAR IOM I reviewed some months ago, as good as it is, does not approximate the neutrality the 5 seMk3 can convey. There is a level of clarity in this speaker that I seldom hear. There is a crispness and a freshness here that adds to its ability to sound totally natural. At times the music seems to glisten, as if more improvements were made to my audio system than just the speakers.
Much like the tonal character that emanates from my Martin Logan CLSs, the Mk3 is smooth and neutral throughout most of the midrange. The Mk3 has a degree of mid-to-upper midrange clarity that strips away several veils to reveal a level of inner detail that 1 must. again, compare to speakers costing more than ten times that of the 5 seMk3. If I can draw an analogy in the computer world, the experience I am trying to convey here would be similar to viewing an extremely complex illustration on a high resolution monitor that graphic artists often use, compared to the same work on a conventional .28 dot pitch monitor administrative types use word processing. White most of the image one sees on lesser monitor is quite acceptable, the higher resolution monitor reveals subtle shadings and detail that the lesser onitor cannot reproduce. Much in the same way that better omputer montors can. furthermore. produce a greater degree of focus as the image nears the edges of the screen, SseMk3 renders a near-perfect sound stage from left to ight, top to boltom, and front 10 back, if the associated equipment has this capability. One Supertramp recording ames to mind that demonsirates well this unusual ability. At inning of the title track of their album, Even in The Quietest Moments, the listener hears a bird chirping first to the extreme upper left of the sound stage. The Paradigms offer a very convincing image as the bird appears to move from branch to branch from left to right before it disappears into the far right foreground of the stage. So .convincing is the spatial presentation, that our cat, Bucky, follows the sound across the living room looking upwards for the physical evidence of what he hopes is his next meal.

As the midrange makes its transition into the treble region, the speaker starts to falter. While our small listening panel thought the 5 seMk3's treble was very good, several had misgivings about its continuity and extension. By comparison to my Martin Logan CLSs, the 5 seMk3 is a little unrefined. It lacks the air and spontancity of the electrostatics, although it provides some improvement in age localization.

## "EXCELLENT"

"... among the top few models that must be auditioned by anyone shopping in the under$\$ 1000$ price range."
"... our listening panel liked the 7 se Mk3 quite a lot, repeatedly praising its mostly balanced nature: 'pretty wellbalanced voices,' 'very clear Ladysmith [Black Mambazo],' and 'nice clarity on male chorus [Turtle Creek Chorale]."
"... bass extension was surprising: using the Sound \& Vision Audio Test CD, there was lots of bass at $32 \mathbf{~ H z}$, with still audible output at $\mathbf{2 5 ~ H z ! " ~}$
"The 7seMk3 is an excellent example of what [Paradigm] can do."
"Overall, the 7 seMk3 is a handsome speaker, small enough to fit in fairly tight quarters, and inexpensive enough to fit tight budgets."

## Sound \& Vision

ver the years we've had many opportunities to evaluate speakers from Paradigm, and have always been impressed by the level of performance they achieve at low cost. The 7 seMk 3 is an excellent example of what the company can do. It falls near the middle of the line, at least in terms of price.

The speaker is a relatively modest floor-standing unit, about hip height, and quite narrow. It's finished in black wood-grain vinyl except for its front panel which, as usual with Paradigms, is silver. The Mk3 is a two-way system with a 1 -inch fabric dome tweeter and two 6.5 -irch clear polypropylene woofers beneath it. Below that is a large port. The rear panel sports dual heavy-duty gold binding posts for bi-wiring.

Overall, the 7 semk 3 is a handsome speaker, small enough to fit in fairly tight quarters, and inexpensive enough to fit tight budgets.

## Measurements

Figure 1 is made up of a large number of frequency response measurements taken at various angles in an anechoic chamber and combined to create the three average curves shown. The top curve represents the sound going directly from the speaker to someone sitting in the stereo seat, as it's made up of measurements taken on axis and up to 15 degrees off-axis-the "listening window". Reflections from surfaces near the speaker often combine with this direct sound and affect the overall tonal balance; these are shown in the bottom curve, measured 60-75 degrees off axis. The middre curve- $30-45$ degrees off-axis-indicates the sound radiated into a listening room's reverberant field. In this case, the curves are very well-behaved, showing only a certain roughness in the midrange and a small sag from 1 kHz to 5 kHz . This was noted by our listening panel in several selections-"not entirely smooth," "some mid suck-out on Harry [Connick Jr.] and Patti [Austin]"-but was not deemed very serious. The somewhat elevated low end was also apparent with some music, eliciting the occasional comment on the speaker's fullness or fatness

The total radiated power in Figure 2, which indicates how the speaker will sound in a real acoustic environment, confirms the earlier curves. The lower curve is the directivity index, and it shows the 7 se to be fairly typical of today's point-source speakers, with few problems.

Total harmonic distortion across the spectrum for signals that produce outputs of 90 and 95 dB SPL is shown in Figure 3. The solid, $90-\mathrm{dB}$ curve indicates very low distortion; the 95 dB measurement shows only a slight increase, which means this speaker should reproduce pop or classical dynamics convincingly. In fact, this is the one major improvement between this version of the speaker and its predecessor, which we reviewed in 1987. On the other hand, the: Mk3 is relatively insensitive, measuring 87 dB SPL in the anechoic chamber.

Impedance (Figure 4) drops to about 3 ohms in the upper bass, suggesting that these speakers should not be connected in parallel.

## Listening Tests

During blind listening tests, using a wide variety of music, our listening panel liked the 7 sem M 3 quite a lot, repeatedfy praising its mostly balanced nature: "pretty well-balanced voices,"
"very clear Ladysmith [Black Mambazo]," and "nice clarity on male chorus [Turtle Creek Chorale]." The midrange irregularities were noted, as was the slightly prominent bass, but compliments outnumbered criticisms by a considerable margin. And bass extension was surprising: using the Sound \& Vision Audio Test CD, there was lots of bass at 32 Hz , with still audible output at 25 Hz !
The Mk3's fidelity rating was 7.7. an excellent result that places the 7 sem 3 among the top few models that must be auditioned by anyone shopping in the under- $\$ 1000$ price range. particularly one that we have been impressed with in the past. It was just over four years ago that we tested an earlier version of the Paradigm 11 se, then in its Mark 2 version. At the time, we noted small problems in the upper bass and some midrange irregularitics, but overall we judged it to be a well-balanced speaker with excellent bass.

The current version is obviously kin of that older model, both in physical appearance and in the measurements. The main difference is a much greater smoothness in the curves, notably through the bass and midrange, and a corresponding increase in favourable comments from our listening panel.

The 11 seMk 3 is a three-way system in a floor-standing ported enclosure. The box is black woodgrain vinyl, except behind the snap-off grille, where the front panel is Paradigm's trademark silver finish. The speaker is unusually heavy for its size, and rapping the sides produced a thud representative of damping. The rear panel sports dual gold-plated heavy-duty binding posts for biwiring or bi-amping.

Like its predecessor, the 11 seMk3 uses a pair of 8 -inch woofers with transparent polypropylene cones and rubber surrounds. Beneath them is a large, 4.5 -inch port. Where the new model differs is in being a three-way, with a largish ( $61 / 2$ inch) cone midrange and a 1 -inch fabric dome tweeter. The addition of the extra driver appears to have paid dividends in the smoothing out of the midrange.

## Measurements

Figure 1 shows the frequency response measured in an anechoic chamber. The three curves are each an average of many measurements taken at different positions in the chamber. The top curve is made up of measurements made on axis and within a "listening window" of up to 15 degrees off axis. This generally represents the sound that a listener will hear directly in front of the speaker. The botom curve consists of measurements made 60 to 75 degrees off axis, representing the sound reflected off room surfaces near the speaker; these often combine with the direct sound to create an overall balance. The middle curve was measured 30 to 45 degrees off axis, and indicates the sound sent into the re-verberant field of the listening room. All three measurements can contribute to the overall balance of sound a listener hears, and so should be as similar as possible.
The total radiated power (Figure 2) combines the measurements, at all angles, representing what will be heard in an average room. The botom curve is the directivity index. indicating the 1 lseMk3's dispersion.
A very high level of performance is in all these curves-they're particularly smooth and free of sharp irregularities. The slightly elevated part of the curve at the low end might indicate some heaviness in the bass. but it also contributes to the excellent bass extension: in our listening tests we were able to hear substantial output as 25 Hz , and even some at 20 Hz . At the other end of the scale, the highfrequency rolloff is a bit steeper than we have sometimes seen (and a bit more than the Mark 2), but that didn't appear to be a problem for our listeners. The very slight sag in the midrange was noted occasionally, but it is within the limits of some of the best speakers we have tested.

In other tests, the sensitivity was measured at a fairly low 85.4 dB SPL, which suggests this speaker could do with a hefty amplifier. Nevertheless, the distortion figures when the output is increased from 90 to 95 dB SPL hardly change (Figure 3). which indicates the Paradigm can handle lots of power and will be comfortable with wide dynamic peaks. Impedance (Figure 4) drops to 3 ohms at one point in the spectrum, so connecting an extra set in parallel would be inadvisable

## Listening Tests

Using a variety of jazz, rock, and classical recordings. the 11 seMk3 was compared in scientifically controlled blind listening tests with other brands of speakers of differing size and price, in which the identity of the speakers being auditioned was concealed. Predictably, our listening panel liked this speaker a lor. What minor problems there were did receive comment-"boomy piano, but pleasant." "piano clear. good; perhaps a bit of coloration"-but overall, favourable comments dominated, "Lovely clarity and openness," "excellent cymbals and bass," "very real." and "fine detail on Ladysmith [Black Mambazo]" were typical reactions. The Paradign's imaging was also excellent.

With the new 11 seMk3, Paradigm has taken an already good speaker and made it better; even "great" wouldn't be out of place in describing the 11 seMk 3 's performance. That's admirable in itself, but that the price in four years has only gone from $\$ 1,000$ to a very reasonable $\$ 1,050$ a pair will make this fine product available to a wide audience.

# "GREAT" 

"A very high level of
performance..."
"... excellent bass
extension..."
"With the new IIseMk3,
Paradigm has taken
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"... overall, favourable comments dominated,
'Lovely clarity and
openness,' 'excellent cymbals and bass,' 'very real,' and 'fine detail ...' The Paradigm's imaging was also excellent."
"... the Paradigm can handle lots of power..."
"... our listening panel liked this speaker a lot."

## "ASTONISHING"

## "These are true bipolar radiators."

"... the dynamic capabilities of this speaker are considerable, with powerful bass right down to the lowest pedal notes, and a clean, focused midrange that makes all voices and instruments sound very natural..."
"The tweeter is fast and
detailed..."
"... remarkably good... retaining all the virtues of a direct radiating type, while adding extra spaciousness and a very realistic sense of depth without compromising detail or lateral imaging."
"This is a true high end speaker at a quite astonishing price... there's literally nothing else in the market at anywhere near the price... which combine this level of sound quality, accuracy, and wide, smooth frequency response..."

Auctio léeas Guide

$\square$his Canadian company has been pushing ahead with new technologies in speakers, and is now designing and making all drivers, as well as amplifiers for a new line of powered subwoofers. I recently visited the new automated amplifier assembly line, and saw stuffing equipment that is reminiscent of what I've seen in Japan, though on a much more modest scale.

Now Paradigm has introduced a line of bipolar speakers, with identical front and rear driver complements in tall narrow cloth covered cabinets with shiny piano-black top and bottom plates. The Esprit/BP Bipolar employs a pair of $6^{1 / 2^{\prime \prime}}$ polypropylene woofers coupled with 1 " metal dome tweeters in a rearported design, the port near cabinet bottom, just above the gold plated/plastic-nut bi-wire terminals.

Bolh drivers have been designed from scratch, the woofer having a new heat-sink vented diecist aluminum basket that contributes airflow around the spider and voice coil to improve power handling and linearity of motion. The cone is "mineral filled polypropylene...with synthetic butyl surround" with a "1/2" high temperature voice coil on an Apical former". A "focused-field geometry magnetic assembly" contributes to this woofer's accuracy under extreme drive conditions, according to the Paradigm fact sheet.

The 1 " iweeter is a "pure aluminum dome with textile suspension" in a "heatsink diecast chassis" with dual magnets and an aluminum voice coil former. It is ferrofluid cooled and damped, with power handling improved by the solid heat conducting front plate and basket. Crossover between the drivers is paralleled to each pair from a network described as being " 2 nd order electroacoustic at 1.7 kHz " that is phase and frequency corrected.

The enclosure, undemeath all the black fabric. is "highdensity composite hardboard" with "MDF front and rear baffles, containing internal "critical radial and shelf bracing in a latice locked configuration" to ensure rigidity and freedom from resonances. Unlike the quite wide M Series bipolar speakers from Mirage, the Espri1/BP has a quite narrow front and back baffle with beveled edges to minimize diffraction.

The Esprit/BP was measured at front for our normal quasi-anechoic curve, this very linear through the midrange and treble, with a tweeter resonance that is well controlled seen at about 15 kHz . Measured in a pair of identical Iront and back sets (the rear ones displaced down 10)dB for clarity, but taken at the same level and microphone position with the speaker turned around), the room curves are very similar. and very smooth with a minor midrange dip around 4 kHz . Above and below response is $\pm 2 \mathrm{~dB}$ on both sides from 20 kHz down to about 400 Hz , where it starts to rise moderately. This mid-bass warmth yields to a very smooth deep-bass extension to below 30 Hz . Because these speakers are bipolar, their placement for optimum midrange spaciousness, well out from walls and corners, should smooth out the mid-bass area while retaining the solid deep bass

A little roughness at 600 off axis can be seen, and is largely the result of front-rear driver interference in the lower
midrange especially, and is of no consequence at the listening position (either in front or behind). These are true bipolar radiators and clearly provide a wide listening axis with very good dispersion in front or bebind.
Impedance was quite benign, rising to 20 olims in the midrange, dropping to tohms near 200 Hz , with a woofer peak of about 13 at 50 Hz ; the large rear port does not seem to cause any impedance rise. Electrical phase is also quite well controlled, varying over $\pm 45$ in the midrange, and very accurate at upper frequencies. The Esprit/BP Bipolar should not pose any problems to an amplifier, and will like plenty of current for hest bass performance. With its double-driver complement it is quite elficient.
Listening to this speaker in comparison to the 11 seMk3 was an interesting experience: while the smoothness and bass solidity of the latter were very impressive when I switched to the Esprit/BP the whole soundstage opened up, and stretched beyond and behind the tall boxes. In my review of the I 1 seMk 3 I noted that, "nothing jumps out at you, and there is more sense of the whole than the individual parts." Itry not to write between the lines. as it were, but one's subconscious is always pusting the fingers: I think now, having heard this speaker paired with more than a dozen others since, that part of what I was saying is that the 11 seMk3 does have in direct comparison, a slightly boxy or closed-in sound. simply by virtue of its large batfle area. A listening distance a few leet closer tends to minimize this.

By reducing baffle area, and creating a bipolar design, Paradigm has in the Esprit/BP eliminated this characteristic in a speaker whose measurements are surprisingly similar (of course, as speakers get better. their curves will stast to look more alike; however, there is no denying the family resemblance here). But they sound quite different, if not in frequency balance, in their spatial perspectives, which is exactly what designer Scott Bagby intended.

I don't think that there is a necessarily right approach to speaker design in this respect, though my home listening room definitely preters direct radiating types. Wide rooms with more space out from corners (like that in the testing studio) are better suited to bipolar and planar designs, and the Esprit/B!' will thrive in such environments.

The fact that the sound picture is so similar from front and back helps imaging in a bipolar speaker, in that reflected sound will have much the same character as direct, and being
delayed, will not cause response anomalies, but add to perceived spaciousness and depth.

Getting away from the question of imaging for a moment. the dynamic capabilities of this speaker are considerable, with powerful bass right down to the lowest pedal notes, and a clean, focused midrange that makes all voices and instruments sound very natural, with just an extra bit of warmith on male voices. bassoons and hrass.

The tweeter is fast and detailed, with no splashiness at high levels. 1 heard more detail and articulation from this speaker than from the 11 seMk3 suggesting that lateral spatial cues are not compromised by the bipolar design. This is also due, I think, to the new metal dome iweeter's quicker transient response and better power handling ability

Of course, if you set them up angled in within a couple of feet of a corner. you're likely to find imaging and clarity compromised, with all kinds of phantom images coming out of the conners. A pair of EsprivBl's will probably sound best aimed straight ahead at least a metre from any boundary in a good-sized room.

And, finally, let's return to the question of imaging in bipolar and dipolar speakers: a dipole radiates oppositepolarity energy to the rear, and is even more difficult to set up than a bipolar, usually requiring some tocing in to provide the optimum balance of cancellations and reinforcements for realistic midrange and adequate bass: an inch or two either way can drastically change the sound quality

On the olher hand, a bipolar speaker radiates its energy with the same polarity to front and rear, and is much less sensitive in terms of placement: the already noted concerns about boundary proximity exists. of course, but we're not dealing with drastic sonic changes with an inch of movement, but simply oplimizing the balance of direct and reflected sound, which can also be achieved through room treatment behind the speakers.

All that said, the Paradigm Esprit/BP Bipolar is a remarkably good lirst attempt at this lype of design, retaining all the virtues of a direct radiating type, while adding extra spaciousness and a very realistic sense of depth withoul compromising detail or lateral imaging.

This is a true high end speaker at a quite aslonishing price. If you're a bipolar fan, note that there's literally nothing else in the market at anywhere near the price of the EspritBP. and few speakers, period, under $\$ 2000$ which combine this level of sound quality, accuracy, and wide, smooth frequency response, and, in effect, do it in duplicate

This high-profile Canadian manufacturer is known to produce loudspeaker systems in the so-called affordable price ranges - and lots of them, at that. Their products cover the price ranges from $\$ 200$. to $\$ 2,000$. spread over 26 models. The Espri//BP is the lower-priced of two new moclels in a new series. Those of you who had read our feature article Canadian Profile in TIER volume 6, $\ddagger 4$ will recall that we mentioned that Paradigm was about to introduce a few new designs, including this series. subwonfers and home theatre components. The model under review here employs new driver designs, developed in-house at Paradigm's extensive research facilities.

## Appearance:

The Esprit/BP are slim, monoliths with a rather elegant appearance. Black wrap-around grills enhance and emphasize the enclosure's graceful proportions. They stand 115 cm tall with a footprint of $22 \times 34 \mathrm{~cm}\left(45^{1 / 8} \times 8^{1 / 2} \times 13^{3 / 4}\right.$ inches). Solid 5 -way binding posts at the bottom of the enclosure offer the bi-wiring option. Spikes at the bottom allow decoupling from and solid anchering to the floar. While these loudspeakers cannol be hidden away somewhere out of the way, the tall slim enclosures manage to blend well with - even enhance - the decor of most listening rooms.

## Technology:

Innovative designs hold a certain fascination for us all and while we may appreciate the beauty of a design. it's the lechnology which yields the end result - the musical data that we appreciate the most.

This is a bi-polar design, which means that the loudspeakers (four drivers in all) radiate equally from the front and back, but in phase. Paradigm developed new drivers for this system. There is a new $165 \mathrm{~mm}\left(6^{1 / 2^{*}}\right)$ woofer which boasts a high-pressure die-cast aluminum chassis. designed to all but eliminate vibeations, resonances and the resulting structural changes of the basket. Additionally, the basket incorporates two sets of heatsinks which allow airflow around the assembly. Paradigm calls it AVS ${ }^{\text {IM }}$ which stands for Airtlow Ventilation System. The cones are made of mineral-filled polypropylene which yields a high rigidity-to-mass ratio with outstanding internal damping characteristics. This results in colouration-free wide frequency response and relative freedom from resonances. A magnetic assembly features a symmetrically focused field geometry to control driver excursion - linearity - under extreme drive conditions. The cone is suspended with a high stress-release and strain-dampening butyl material which helps to eliminate resonance-based distortion. A 38 mm ( $1^{1 / 2} \mathbf{2}^{\prime \prime}$ ) high-lemperalure voice coil with a ventilated Apical former assures extended linear response regardless of cone excursion.

The tweeter is a low mass pure aluminum dome ( $\mathrm{PAL}^{\mathrm{TM}}$ ) type with treated textile suspension. The convex dome is assembled to a high-pressure diecast aluminum faceplate. The high-lemperature voice coil operates with a ventilated aluminum former in a ferrofluid cooling/damping environment which provides high power-handling and low distortion for the system. A dual symmetrically-focused magnetic field completes the tweeter's assembly.

The crossover network employs a quasi-Buterworih configuration with premium hand-selected parts. The crossover poinl is quoted al 1700 Hz .

In a design such as this one, it is important to control enclosure resonances. Paradigm utilized 1 -inch thick MDF for the front and back baffles. Three itterlocking fullperimeter horizontal and vertical braces are positioned in a cascaded arrangement - that's each brace connected in a manner that eacl operates the next. This is a very sophisticated mechod and shows that the designers had put a lot of time and elfort into this system. Finally, a highvelocity tuning port at the botom of the enclosure had been designed to assure maximum bass efficiency with minimal turbulence distortion. And all this, to reproduce.

## The Sound:

We wanted to find out what these loudspeakers can do under different amplifier or system conditions. Our initial audition took us by surprise, when we had the BP connected to our main system in our upstairs studiofiving room. We should tell you here that all of our listening tests take place in a house and living room much as you would have in your
"MARVELOUS"
"... very revealing with a músical quality that will not allow a casual walk past the system without stopping
for a listen."
"... our panelists
thought that the
Paradigms are much
higher-priced
boudspeakers."
"These loudspeakers
perform as well as one
would expect from
speakers in twice the:
price-range -
simply marvellous."
"STUNNING"

"A stunning image with well defined acoustical boundaries, astounding front-to-back layering combined with excellent height and depth are but a few of the Paradigms' features."<br>"... lower midrange steadfastly maintain focus, detail and equilibrium with information above and below."

> "In this light the Esprit/BPs rate extremely high in both the technical design work and the resulting musical accuracy."

"... have a listen to these gems."
listening environment. The main system at TIER are two OCM 500 amplifiers - balanced mode - an OCM 88 preamplifier, a Teac VRDS20 CD player and interconnects by Vampire Cable. Our bi-wired configuration are Transparent Super and Vampire cables. As we mentioned above, we connected the Paradigms with this system to break them in since they came to us brand-spanking new. We left them hooked up for about three days and noticed a steady improvement, although they sounded surprisingly good after about one hour of operation. Three days later, we conducted some listening tests with familiar discs. Well burned in, the Paradigms had become very revealing with a musical quality that will not allow a casual walk past the system without stopping for a listen. Most of our panelists are spoiled out of their minds listening to $\$ 7,000$. Mirages without as much as a blink of the eye. When new speakers arrive, they are scrutinized and, although our editor discourages comparisons, they often refer to the known criteria. Call it human nature, call it subjective curiosity or call it nothing - fact is. the Paradigms operate with the same design principle as the Mirages, the bipolar system. And like the Mirages, the Paradigms offer similar spatial and focal information, when set up in the proper manner. A stunning image with well defined acoustical boundaries, astounding front-to-back layering combined with excellent height and depth are but a few of the Paradigms' features. The highs extend smoothly into the dog-whistle range without noticeable edginess. Occasionally, program material with large orchestration, becomes a bit crowded in the upper midrange areas, while the lower midrange steadlastly maintain focus, detail and equilibrium with information above and below. This "crowding" isn't apparent at all with small musical ensembles which is why some of our panelists thought that the Paradigms are much higher-priced loudspeakers. The bass information is powerfully robust without coming across as domineering. Resolution is excellent down to about 36 Hz . Below this point the speakers offer quite a bit of energy, alas without the ultimate resolving abilities so apparent in the frequencies above the 36 Hz . Although it's highly unlikely that the Paradigms will be connected to such an elaborate system boasting about 1,000 watts per channel, this arrangement sounded altogether stunning. The above-mentioned sonic traits serve as reminders that the panelists actually compared the system with the Mirages - which is a bit unfair to either company, but.

We moved the Paradigms to our downstairs listening room to hear how they perform with a smaller system made up with the Bryston 3B amplifier and a Dolan preamplifier. This time, the acoustic environment had changed dramatically, the power had been reduced to about 100 watis per channel and our wiring changed to lower-priced cable such as Flatwire and the lower priced Vampire. The basic sound remained the same as we described above, proportional with the backup components. The Onkyo receiver (reviewed somewhere else in this issue) also complemented the sonic benefits of the Paradigms, making them candidates for a large selection of associated components. If we had to describe the Esprit/BP in one sentence, we would simply say: These loudspeakers perform
as well as one would expect from speakers in twice the pricerange - simply marvellous.

## Synopsis \& Commentary:

Before we come to our conclusions, let us tell you what we believe a good pair of loudspeaker should do for listeners. We believe that - regardless of design philosophies. component quality, etc., loudspeakers should do nothing but reproduce the information fed to them via the backup components. What the listener should hear is the music, of course, and perhaps the quality of the backup system. When listeners can settle down to take advantage of the very purpose of a loudspeaker, nothing matters - or should matter - but the music. The Espriv/BP offers modern technology in addition to musicality. In this light the Esprit/BPs rate extremely high in both the technical design work and the resulting musical accuracy. In order to extract the most from the loudspeakers, it's important to set these bipolar designs up correctly. If you have enough space, keep the loudspeakers 18 to 24 inches away from sidewalls. If you must place them closer to the walls, toe them toward the listening area by about 20 degrees. The wall behind the speakers should be uncluttered and at least two feet away, with the best results closer to four feet away from the rear wall. The best acoustical interaction with the listening room will be achieved when the loudspeakers are positioned approximately one third of the entire length into the listening area. This allows one to create a deep sound stage with maximum clean bass response. The distance between the loudspeakers isn't as important, but bear in mind that the best listening position is the so-called sweet spot, the same distance in front as the distance between the speakers. Wiring is important, and the Paradigms can be bi-wired for best results. If you follow the setup procedure we just described, you'll be pleasantly surprised at the Paradigms' performance and you will hear the reason why we rated them highly. Visit your dealer and have a listen to these gems.
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In the U.S.:
continued from last editorial page
blues clubs to satisfy those who are in the hi-fi business because they love music. But Chicago is a modern American metropolis tainted by that which turns some major cities into financial sinkholes best avoided by companies smaller than Sega, Microsoft, or Matsushita. A combination of fire-department regulations, excruciatingly high prices (even by American standards I hasten to add), and loony-tunes union behavior has conspired against the specialist hi-fi community, if not the consumer electronics industry as a whole. The big boys play at convention centers whatever the city, so they're immune to the wiles of hotels. And money is never an issue when your turnover is larger than the gross national product of, say, one of the new Soviet republics.

Although the Chicago Hilton has proven to be a near-perfect venue for the high end-cum-specialist sector that has supported the show since Year One, it's the show in McCormick convention center the general media (newspapers and TV) consider to be the "real" CES. Your basic newspaper hack has heard of Panasonic, Sony, et al.; any company with a turnover below nine figures just doesn't matter to the likes of a CNN or USA Today. And so the Hilton sits there like some mad uncle locked away in the spare bedroom in the attic. It is treated almost as an afterthought, or as a necessary evil. Despite the paucity of products launched in the convention center itself, the "Zoo"-as it will forever be known-still received the lion's share of coverage in the CES "dailies" and on TV. It's as if the Hilton wasn't there at all, despite the EIA's recent efforts to make the high-end community more a part of the CES as a whole.

Compare this with Las Vegas. Only 10 years ago, Chicago was the CES to attend and the Las Vegas event was the low-rent offering. But there's been a complete reversal during the past decade, with Chicago no longer having the appeal it once had, art museums, four-star restaurants, and a dearth of neon aside. Las Vegas-for all of its ersatz gloss, screaming commercialism, eye-aching glitter, arch vulgarity, and unequalled crassness-has cleaned up its act. The comfortable and inviting Mirage is a far cry from the sleaze pits of yore, while
the Sahara's days are numbered. And people that you'd swear would find Las Vegas completely infra dig now actually look forward to it . . . especially those West Coast manufacturers who might seem a bit precious and sniffy at times, but who simply cannot deny the convenience of a convention site only an hour's flight from L. A.

And yet there was plenty to see and hear at the final Chicago CES. None of my colleagues had to pad a show report with car

> CHICAGO HAS ENOUGH BLUES CLUBS TO SATISFY THOSE WHO ARE IN THE HI-FI BUSINESS BECAUSE THEY LOVE MUSIC.

hi-fi, multiroom hardware, digital broadcasting, or any of the other peripherally related toys that veer from the classic source/amp/speaker set-ups that constitute "real hi-fi." Brentworth Sound Lab and DGX Audio used clever systems in their new loudspeakers featuring dynamic signal shaping. Tiny speakers made a comeback with a flood of models from Monitor, ELAC, Rogers, Harbeth, Totem, Celestion, and KEF (with their own branded LS3/5A no less, after years of making only the drivers and crossovers for this BBC classic). Speaking of classics, Acoustic Research turned up with a Model 3a revised for the 1990s.
CES being an American show, there was no shortage of floor-standing stuff either. ProAc, Thiel, Amrita, Vandersteen, Epos, Mission, Focus Audio, Dzurko Acoustics, and Merlin offered non-frightening, nearly traditional systems while Audio Physic, Concentric Speaker Technology, Mirsch, Meridian, Spheric Audio Laboratories, and A.R.T. chose to defy convention by displaying everything from upholstered speakers to multi-driver arrays to horn systems which won't even fit in the back of a Chevy El Camino.

Tubes refuse to go away, keeping me and other bottle freaks happy for at least another calendar year. Propping up either the Russians, Yugoslavians, or Chinese (or others still making tubes) were Audio Sculpture, Art Audio, Melos, AudioPrism,

Lamm, Joule Electra, and Valve Amplification Company. Over in the solid-state arena, there were surprises like Rogers' return to amp manufacture, the chunky separates from Higher Fidelity and new units from Creek, Oritron, Arcam, Sim Audio, Densen, Sonographe, Carver, and Bob Carver's new venture, The Zeus Project.

Digital technology continues to develop with Theta, Krell, Arcam, Creek, Resolution Audio, Audio Research, and Camelot showing new converters, transports, or players at all price points. Home cinema is no longer a stranger to the high-enders, with Krell, Meridian, Counterpoint, Snell, Enlightened Audio Designs, Alon, and every other manufacturer with a modicum of foresight launching either surroundsound decoders, multi-channel power amps, center-channel speakers, or subwoofers.

One-offs were there in abundance. Though hardly what you'd call either a hifi product or something suitable for home cinema, Marantz dazzled visitors with a truly watchable pocket-sized LCD TV. The Zapp Zero Corp., a new firm started by the founder of Primare in Denmark, showed only computer-generated impressions of a new CD transport and an integrated amp, but they were enough to get you salivating. Densen, the Scandinavian amplifier producer, issued DeMagic, a CD demagnetizing disc with a three-minute track that "cleans the entire signal path of magnetism which has been built up during playback due to a.c. leakage. . . ." Analog supporters weren't shortchanged, either, Creek having issued the nifty little plug-in phono module for its preamp as a stand-alone device in its own enclosure. Audio Alchemy, best known for purely digital hardware, showed the sweet little VAC-In-The-Box, a socalled "Vinyl/Analog Converter," or-to you and me-a cleverly named phono stage.

So did the 1994 Summer CES show the specialist sector to be a wheezing, ailing industry awaiting its funeral? I think not. It isn't the hi-fi community's fault that Chicago itself was prepared to undervalue a quarter century's worth of CES loyalty and support for the once-in-a-lifetime burst of revenue from World Cup Soccer. Then again, staring for too long at a Gameboy is bound to create myopia.

## CURRENTS

## WALKIN' FROM CHICAGO

No, this is not a violation of sampling theory or any other fundamental law, but simply good engineering, rooted in psychoacoustics, and can be done within an overall framework of backward compatibility with all previous CD players.

I have mentioned this in some detail, because I want to discuss the


Ihis year's was the last Consumer Electronics Show at McCormick Place. It comes as no surprise to anyone remotely connected with the trade. The only difficult thing about the decision is that we shall all miss Chicago in June. Next year, Philadelphia will be the host city for a new show called CES Interactive. That title pretty much indicates one shift in emphasis that has been underway for several years. Trade shows follow markets, and where there are many product innovations, two shows per year can perhaps be justified. But consumer audio and traditional video long ago reached the point in their development where real innovation could be seen over a period of years, not months. Las Vegas remains the seat of the Winter CES and will no doubt continue as the premier show for those areas, perhaps with even more emphasis on audio.

Many companies were not displaying at the final Chicago show; it was limited to three days and was for the trade only (no open day for consumers). While attendance was much lower than in previous years,
the prevailing mood was good, and many exhibitors spoke well of the quality of traffic.
In its 12 years, the $C D$ has become an exceptional medium for music, photographs, general information, and interactive games; now it is about to prove its ability to handle video. Manufacturing costs for the disc itself, regardless of content and programming standards, remain in the range of a dollar and change, and as far as I can tell, the $C D$ is going to be around for many decades to come. I simply cannot think of a medium that accomplishes so much at so little cost. Even in its original application as a linear 16-bit digital carrier for music, the CD has made quite remarkable strides in terms of its increased dynamic range (through noise shaping) and may hold open some possibility for increased high-frequency bandwidth (through resourceful reassignment of less significant bits).
greatest challenge so far for the Compact Disc, and that is the storage of high-quality video. First, a couple of comments on data reduction. In audio systems such as MiniDisc and DCC, data-reduction rates of four or five to one are used. A higher rate could be used, but for now, these ratios suffice.

The LaserDisc of course has no data reduction; it is an analog video medium and has sufficient bandwidth to produce a beautiful picture. Its big problem is cost. VHS tapes of are of lesser quality but are still expensive to reproduce on the standard one-to-one tape duplication basis. In video, there is normally much greater signal redundancy than in audio, and this makes it possible to apply much higher ratios of data reduction to the program, if that program has been digitized. In the Philips exhibit, I saw several examples of digital video from a CD base. These were standard Philips

# Movie Theatre Performance with Flexibility The Bryston 8B THX ${ }^{\circledR}$ Amplifier 

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CD-i players in which a special cartridge had been installed, making the machine capable of playing any of the CD digital video 5 -inch discs. What I saw looked very good, but most experts feel that the highly data-reduced video signal is about on a par with VHS. These discs will run in the $\$ 25$ range, and the available titles include many of the blockbuster and action movies of recent years.

There is much current debate in the motion picture industry, especially on the creative side, regarding video data reduction and the effect this may have on overall quality standards and expectations in the field. In a sense, they are going through the same soul searching that the record industry went through in the early days of the CD (although the situation is not exactly analogous). I have a feeling that any current problems will be solved very quickly, and that we will be able to get standard video of high quality from a 5 -inch disc in short order.

It is always gratifying to see a known technique for improving sound reproduction be applied with a minimum of complexity and a maximum of benefit to the user. Such is Charles McShane's simple passive circuit for interchannel crossfeeding of antiphase signals at low frequencies. This has the overall effect of spreading the stereo image out somewhat from the actual positions of the loudspeakers. To my knowledge, only Fried Products of Philadelphia has licensed the technique, but there will undoubtedly be others. The method is known by the acronym M.A.R.S., which stands for McShane Ambience Retrieval System. M.A.R.S. is not a stand-alone network but must be designed into the speaker system. The loudspeakers must use dual voice-coil woofers, and this may be a sticking point for some manufacturers. McShane has carefully worked out
all network details and achieved excellent overall tonal balance on the systems that I heard. In fact, the circuit is intended to be left engaged all the time, producing as it does an improvement on just about all program material. I have always said that some of the best sound-and music-at any CES was to be heard in Bud Fried's demo room. Now, it has gotten even better.

On the software front, there was very little activity with either MiniDisc or Digital Compact Cassette. A few new models, primarily for auto use, were shown, but the bloom is off, at least for the present, though Philips will introduce home and portable DCC units this Fall. As if things are looking up for the venerable Compact Cassette, we note that there is more activity in Dolby $S$ tape duplicating among some of the major labels. (Remember that this a format many people thought was too little and too late.) It actually provides better playback compatibility over Dolby B and $C$ and non-Dolby systems than does a conventional Dolby B tape. When played over a well-executed Dolby S machine, the results can be extraordinarily good. Perhaps there will be life for Dolby $S$ for some period before MD and DCC experience the price reductions that are so necessary if they are to have a chance in the market.

The LP reissue business is doing very well at this time. While the major labels are doing their best to create the finest "vintage CDs" they can, many of them are at the same time leasing their masters to entrepreneurial groups who are making the finest "vintage LPs" they can! Such companies as Analogue Productions, Chesky, Classic Records, Reference Recordings, and Wilson Audio, are actively turning out LP reissues from the ' 50 s and ' 60 s that, in most cases, are better in quality than the originals ever were during their heyday. A


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## AUDIO CLINIC <br> Joserli giovanelit

## Endless Loop, Endless Problems

Many musicians use endless-loop cassettes to study and emulate musical passages. I have no trouble operating endlessloop tapes on portable recorders of various qualities, regardless of the orientation of the units, but my dual cassette recorder/player cannot handle such tapes.

The tech rep for the maker of my deck could only say that such tapes do not work in machines that are vertical. People in music stores had no clues.
It would seem that that feature of my deck, possibly the tape-end sensor, would be responsible for this phenomenon. If I knew what it was, I could probably modify a deck to operate with endless-loop cassettes. Any information or suggestions you could provide would be deeply appreciated.-Dove Menkes, Fullerton, Cal.

AEndless-loop cassettes, which have been around for years, are mainly used where a message is to be repeated over and over again, such as for "announce" tapes in telephone answering machine. Remember the 8 -track tape format? These cassettes operate along those lines but without the track-changing mechanism.

I once had a similar problem with a really fancy deck. It would start to play end-less-loop tapes, then shut down after a second or so. I don't know if the tape-end sensing system is, as you suspect, the problem in your case-but it was in mine. In most decks, a sensor checks for rotation of the takeup spindle; when no movement is detected (whether because the tape came to an end or has jammed) the machine shuts down. My fancy deck had a similar arrangement, but it sensed the motion of the supply spindle. On the endless-loop
cassettes that I have used, the tape is wound by the take-up spindle while the supply spindle is motionless during operation. Such sensing schemes would interpret the lack of tension on the supply end of the cassette as indicating a broken tape.

I can't imagine why the vertical orientation of the cassette in any machine would affect the operation of endless-loop tapes. You need to examine how your deck works and how it interfaces with the endless-loop tapes. This way, you will know what mechanisms to defeat.

Once you have the tapes running smoothly, be sure to keep the tape path clean. Because these tapes run around and around, they will shed oxide more than you would suppose, especially when they are new.

## Loudness Balance and Perception

Q
My primary music listening is to tapes that I record from my long-playing records. On a 60 -minute tape I may have 20 or more songs, usually derived from many different record albums. I have a very difficult time trying to balance the volume, or


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loudness, levels from one song to another. The recording level meters do not accomplish this-perhaps because they do not measure loudness? Is there some piece of equipment that could be plugged into the deck and would measure loudness? Is there a cassette deck available with this feature built into it?-Harvey Werner, Leesville, La.
A
I know of no easy way to solve your problem. I have not heard of any built-in or add-on devices that can measure apparent loudness.

One factor affecting perceived loudness is dynamic range. Recordings made with considerable volume compression or limiting will sound louder than those with more natural dynamics. Even if the maximum volume levels are the same in each case, the compressed recording will have higher average volume, because soft passages have been made louder. (Some radio stations compress, hoping listeners will stop at the loudest signals; radio and TV commercials are often compressed, as well.) Your tape deck's meter will barely wiggle when you record or play music with restricted dynamics. On music recorded without com-
pression or limiting, the meter will show considerably greater fluctuation.

Equalization also plays a part. Some recordings are made with a "presence peak" at about 2 to 3 kHz . Recordings made with such a peak will sound louder but won't register any differently on your meter. A recording that was compressed and has the presence peak is going to sound really loud!

There are no shortcuts to producing compilation tapes whose tracks all sound equally loud. Use your ears and set recording levels according to your perceptions of each song's loudness. Just be very careful not to overload the tape when boosting selections that seem relatively soft-in raising their average loudness, you're also raising their peak levels, which may have already been high.

## Wrinkled Old Tapes

In his November 1993 column, it was kind of Ed Canby to call attention to the work that I, among others, am doing in the field of audio restoration and preservation. It was coincidental that Ivan Berger's inquiry to

Herman Burstein about tape from 1959 "distorting" appeared in the same issue.

Although open-reel tapes all look pretty much alike, they are quite dissimilar in chemical makeup. Since about 1960, polyester (sametimes called Mylar) backing has been used in tape formulations. Mr. Berger's tape is from the previous generation, whose backing is acetate-based.

The essential difference, as related to his distortion problem, is that the plasticizer in acetate tape is water. Over the years this tape lases its suppleness; when dried oat, it will curl, warp and otherwise avoid consistent head contact. Further, because it is so dry, it often interacts with nonmoving parts in the tape path in such a way as to cause the tape to vibrate. The tape is supposed to slide smoothly in its path. The distortion Mr. Berger described is unrelated to signal level;

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it is neither electronics nor sound waves but rather alteration of the tape's properties, which creates the problem.

The solution, as with so much in restoration work, is simple but time-consuming. The tape should be placed in a very humid atmosphere. It will swell as water vapor is absorbed. Therefore, before starting the restoration, acetate tape should be slowly wound, under loose but even tension, so that

> AS WITH SO MUCH IN TAPE RESTORATION, THE SOLUTIONS ARE SIMPLE BUT TIME-CONSUMING.

the vapor can be fully absorbed. Otherwise "spoking lines" appear and the reel may warp.

What I have just described works for ac-etate-backed tape. The treatment for poly-ester-backed tape is completely different. Silicone lubricant can sometimes work when it is applied to shiny polyester backing. It is not recommended for treating matte-finish, back-coated polyester tapes.

As aging occurs, back-coated tape may "squeal," shed powder, clog heads with debris, have layers stick together, and/or begin to completely delaminate. The cause is chemical changes in the binder that holds the oxide to the backing. A low-temperature baking process has been successfully used to recure the binder temporarily. This baking process cannot be done in a home oven, with its food contaminants and its wide temperature swings. It is done in a dedicated, tabletop, side-convection oven that can maintain temperature to $\pm 3 \%$. The baking is done at about $125^{\circ} \mathrm{F}$ for about eight hours. The best way to control oven temperature is by using an external thermocouple.

Tapes wound on alumimum reels may be processed as they are wound. However, plastic reels are likely to warp. If that happens, the plastic must be broken off and the tape wound onto a fresh reel after going through the baking treatment. Trying to reuse the original reel can result in the tapes' losing fragments and, often, self-destructing while being wound. A treated tape must be copied soon after treatment, because it reverts to its previous state fairly quickly.

What I have described here is really a simplification of the process because other problems, such as "scatter winding," are involved. There have been a number of articles written concerning this process, including mine, which appeared in the Journal of the Association of Recorded Sound Collectors (ARSC) late in 1989. As Casey Stengel used to say: "You can look it up."-Steven Smolian, Clarksburg, Md.

## Slow-Speed Piano

Q
I'm learning to play piano, and I've reached the point where I would like to emulate some of the piano solos on my jazz and pop recordings. Unfortunately, the pianists on these recordings play much faster than I can. I'd like to slow things down a bit so I can pick up every note. Open-reel tape machines had at least two speeds. Do any current cassette decks or CD players have a "slow-down" feature? If not, is there any kind of equipment that can be attached to a cassette deck to achieve a slow-down?-R. P., Hollywood, Cal..

Your options depend on just how much slowing down you need. Do you need to cut the playback speed in half? Or would a more gentle slow-down be more suitable for you?

With a two-speed tape recorder or CD player, you could slow your recordings down to half speed; in the case of the tape deck, at least, this would also drop the music's pitch an octave. (With digital trickery, a two-speed CD player could get around this.) Unfortunately, I know of no CD or cassette equipment currently available that can play back at half speed.

However, there are dual-well cassette decks that offer high-speed dubbing, at twice normal speed. If any such deck can record from an external source while in this high-speed mode, you could feed your CD player's signal to it, then get your halfspeed effect by playing your double-speed recording at the normal rate.

A more realistic (and cheaper) alternative might be to buy an old, used, open-reel deck. (The open-reel decks still being made today are aimed at professionals and are priced accordingly.) If you have these recordings on LP as well as CD, you might look for an old turntable that has a $16^{2 / 3}$ rpm speed, originally meant for "talking books."

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If just a bit of speed reduction is enough, you might find equipment with "pitch controls" that can lower or raise the speed by rather less than $10 \%$. I have seen some Technics professional CD players with this feature, such as the recently discontinued SPL-1300. Several of Marantz's professional recorders have it, too. You might check out the PMD-101 portable (\$260), which offers a $\pm 20 \%$ pitch and speed control, plus selectable normal or half-speed operation. In general, you're more likely to find pitch control in units sold through pro audio and music stores than in your local hifi shop. And while home players and recorders with pitch control exist (the Sony ES TC-WR901ES, for instance), their makers barely mention this.

This year's Annual Equipment Directory lists several turntables with continuously variable speed. Of these, the least expensive is the Esoteric Sound Isi ( $\$ 420$, including arm but not cartridge).

Remember, though, that as the speed of a cassette or open-reel recorder is changed, the pitch of the music changes along with the tempo. So unless you cut the speed ex-
actly in half, you will be playing along in a different key than that of the original recording. Lowering the pitch also changes the sound's character in other ways. The attacks will lose their crispness, leading to problems in picking out the desired notes. And bass notes, depending on your speakers and your room, might become too low to hear.

## YOU CAN ALTER A TAPE'S SPEED TO PLAY ALONG WITH IT, BUT THE SOUND'S CHARACTER CHANGES IN MANY WAYS.

At one time there was a move to produce cassette recorders that operated at $33 / 4 \mathrm{ips}$. If you advertise for one of those, either in our Classified Section or in those of other magazines that deal with high-fidelity matters, you might locate one. [B.I.C was one of the brands offering this feature-I.B.]

Musicians sometimes study recordings by playing a passage over and over again,
"scat singing" along with the music much as you might hear Mel Tormé or Ella Fitzgerald sing. This commits the passage to your memory so that you can hear the notes and play them according to your ability. Eventually you will be able to play them a tempo.

## About Tape Squeal

QI understand that some distortion that occurs during playback of 1,800-foot tape reels at $7 \frac{1}{2}$ or $33 / 4$ ips can be cured by placing some kind of lubricant on the heads of the tape recorder. What is the name of this lubricant and how well does it work?Morton J. Disckind, Orlando, Fla.

A
I believe the "distortion" you have in mind is called "tape squeal." This condition arises as a result of aging tapes losing their built-in lubricants. As tapes are played or recorded, they must pass smoothly over the surfaces in the tape path. Because of its loss of lubricant, the tape tends to alternately stick and release at a rapid rate as it moves over the heads, causing squeal, which can be heard by placing your head near the deck. Of even

# Since 1955, this man (hodder of patents), has quiely been revolutioniiing louspeaker design. 



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

*(the absolute sound, vol. 17, \#92)



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greater importance, the uneven motion modulates the desired signal at a rate determined by the speed of the alternate sticking and release.

I do not believe there is a permanent cure for this. I have been able to eliminate the condition so that the tape can be played at least one time for copying to another tape. The lubricant I use is Wondermist, a silicone spray, from Amway. I assume that similar products would also work well, but I have not tried any others. Rather than spraying the lubricant directly on the heads, I spray it on the tape itself. I lightly spray it on the reel between spokes. In addition, I sometimes put just a dash of the material onto the heads.

If you are fortunate, you will be able to play the entire tape without the reappearance of the squeal. If you are not lucky, find a place to stop the copying, cue both the copy and the source to some editable point, relubricate the source tape, and restart.

Although you might want to keep the original tape for archival purposes, it will never, to my knowledge, be as good as new.

## Tape Head Demagnetization

Q
The owner's manual for my tape deck advises demagnetizing the heads every 30 hours. Do I only have to demagnetize the play head? I understand that I don't have to demagnetize the erase head because the record head is right next to it. Is any magnelization of the heads caused by the magnetic fields on the tapes themselves?-Richard Wang, Irvine, Cal.

As you have indicated, the play head is the one that has the greatest need of demagnetization. The record and erase heads usually do not require demagnetization because of the bias and erase currents fed to them. Because these are a.c. currents, their effect is to demagnetize the heads. It is not a matter of proximity between the erase and record heads.

The play head is not supplied by such currents so it should be demagnetized occasionally. I really do not see a need to do this as often as every 30 hours, but it must be considered as an occasional maintenance procedure. This is a good practice even if the recorder is not used for extended periods of time. The earth's magnetic field
can magnetize tape heads to some extent. For a tape to be playable, it is magnetized along its length in accordance with the signal that has been recorded on it. These magnetic fields on the tape are so small but they do magnetize the heads or other parts of the tape path, although this happens slowly. (Rapid magnetization of playback heads is more likely due to a defect in the tape deck's circuitry: I know, I've had it happen to me.)

## CD Players With Track Lock-Out

In the January issue, Chris Burns asked about CD players with "track lock-out," whereby unwanted tracks could be eliminated from the total program. Pioneer has such a feature on most of its six-disc CD changers. I have worked with three Pioneer CD changers (the PD-M435, the PD-M600, and the PD-M610) which have this "Delete" feature. I should mention that the PD-M600 will only play CDs in random mode after programming deletions. Just pressing "Play" will knock out the deletions. This is not true of either the 435 or the 610.-Robert Bass, Mesquite, Tex.

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## IVAN BERGER

## SNAKE, RATTLE, AND ROLL



Mongooses and Cobras: Fiber for analog's diet.

[ven the fanciest audio cables can pick up some interference, impede the passing signal just a bit, or be a part of a ground loop. Those effects can become audible if the cable is long enough - though "long enough" is a length that varies with the cable and the circumstances. Fiber optics are immune to these problems. But so far, fiber is used almost exclusively for digital signals.
That's because fiber-optic systems have suffered from limited dynamic range. This is no problem for digital: Digital signals have a very small dynamic range themselves, though we use them to encode analog signals with very wide dynamics.

An optical fiber system that claims enough dynamic range to handle analog audio directly has now been shown by ASM Labs, of Marionville, Mo. It consists of an analog optical transmitter and receiver system called the Mongoose and an optical fiber cable called the

Cobra. Two sets are required for stereo. Response is rated 3 dB down at 300 kHz , with a $115-\mathrm{dB}$ dynamic range; ASM says the system can car-
ry signals over distances of up to 2.4 miles without degradation.

Two kinds of Cobra are available. Cobra Standard cables, paired and matched within 0.3 dB , are $\$ 125$ per pair for the first meter, $\$ 10 / \mathrm{pr}$. for each meter additional; prices for the Cobra Ultra, paired and matched within 0.003 dB , are $\$ 175 / \mathrm{pr}$. for the first meter and $\$ 15 / \mathrm{pr}$. for each additional one. The Mongoose is $\$ 649$ per pair, including separate power supplies for each transmitter and receiver. A video version of the system is also available.

## Surround Skrimishing

Dolby's AC-3 digital audio coding system is making headway but running into headwinds. The system already forms the basis of Dolby's SR.Digital (SR.D) digital surround system for movie theaters (see "Digital Film Sound: Rated S for Sound," June '94), has been selected for the soundtracks of the U.S. high-definition television (HDTV) system, and will probably be in use for digital cable TV transmissions by the year's end. Pioneer has demonstrated a LaserDisc with AC-3 and is pushing it as a future system.
$\square$

## Putting the AR in Party

One of the first places I-and thousands of commuters-heard good audio was in the listening booth that Acoustic Research once had in New York City's Grand Central Station. In October, AR will return to Grand Ceutral for an evening, to celebrate its 40th anniversary with a gala birthday bash. Figures from AR's early days, including Edgar Villchur, Roy Allison, and Henry Kloss are scheduled to attend. And so can you. maybe. A limited number of invitations for consumers is available through AR, which is now part of Interna-
tional Jensen's Specialty Audio Group. Requests should be sent to Acoustic Research, 535 Getty Court, Building A, Benicia, Cal. 95842. The invitations are not restricted to past or present AR owners-but if you come without ever having owned an AR, try not to look blank when the reminiscing starts.

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

Overnight, it seems, virtually everyone has discovered the advantages of the satel-lite-subwooler speaker con-cept-especially for use in the home theater.

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


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ate a high-performance, flexible system that can be optimized for both two-crannel music and multichannel film and music reproduction.

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Seventeen years of M\&K experience in Satellite-S ubwoofer systems comes together again to create a new subwoofer performanse standard. And with the $18^{\prime \prime} \mathrm{x}$ $10^{\prime \prime} \times 13.5^{\prime \prime}$ MX-70, M\&K creates a new compact sujwoofer standard.

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The unpiecedented musical articulation and "uftra quick" sound of the MX subwoofers make them the perfect choice to complete any audio or audio/video system.


As virtually every speaker manufacturer rushes to deliver "home theater" speakers to the marketplace, M\&K amasses nearly twenty years of expeience in the field-dating back to Hollywood screer-ing-room installations in the 1970s. M\&K engineers have spent well. over a decade studying the varied aspects of surround sound-including encoding and decoding; soundtrazk recording; and the differences between reproducing sound in theaters and in ho nes.

M\&K speakers excel in tr e reproduction of all source material. Ascuracy, low coloration, pinpoint imaging, wide dynamic range, and deep-tass reproduction are all critical for music as wel as film soundtracks. M\&K Satellites ard Subwoofers have been acclaimed for these attributes since the 'T0s.

And this is why M\&K knows that any speaker that claims to be oxtimized for either music or film sound, one at the expense of the other, will naver reproduce either one properly.

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acter when their sound moves from left to right or front to back in your room.

Even if you are just adding an M\&K subwoofer, front/center, or surround

speaker to your present system, M\&K's unique timbre controls allow you to "fine-tune". the sound of your new M\&K speakers to achieve the closest jossi-
ble timbre-match with your existing speakers-even if they are nol M\&Ks.

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Beware of inexpensive "center channel" speakers. In Pro-Logic, the center channel speaker is driven the hardest, and often reproduces as much sound as the left and right speakers
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Throughout the audio world, M\&K Sound is synonymous with high performance Satellite and Powered Subwoofer speaker systems. And while other manufacturers are discovering the substantial advantages of this concept, we are applying fifteen-plus years of loudspeaker design and audiophile recording experience to create a new, fifth generation of innovative products.
Think of these as comoonent speakers - speakers with the flexibility to adapt to any listening environment, especially that of the multi-channel Surround Sound system. Although compact in size, M\&K Satellites actually outperform large conventional speakers - and M\&K Powered Subwoofers give you the universally recognized superiority of a separate subwoofer for the ultimate in bass performance.
With mid and high frequency drivers mounted in optimally shaped enclosures, M\&K Satellites deliver sharp detail and clarity with pinpoint imaging - going far beyond the "boxy" and "canned". sound of conventional speakers. Our precise driver alignment and unique crossover design insure that sounds reproduced by both drivers reach you simultaneously - giving M\&K Satellites the rare ability to produce the sharp transients and presence of. live musical instruments. Close your eyes and the speakers seem to disappear - the sound is live!
M\&K's component speaker concept perfectly meets the sonic and aesthetic needs of the '90s. And our newest innovations are-advancing audio/video system performance with pedestal subwoofers, high-performance center channel and other speakers optimized for Dolby Surround Sound.
No other company has over fifteen years of experience in the design and manufacture of Satellites and Subwoofers. This experience, combined with the audio industry's only six Satellite, eight Subwoofer line makes M\&K "the only choice."


## DCC Development

Philips is making several moves to accelerate DCC's sluggish initial sales. Prices of first-generation DCC products are being reduced, while new homeand professional-DCC units reach the market. Improvements in the new home products will include 18 -bit D/A sections (for which 18 -bit DCC recordings will be available), the ability to title home recordings, microphone inputs, and faster track access. At CES, Philips also showed a DCC deck that could record analog cassettes (other DCC machines can only play analog tapes), but only as part of a shelf system. A full-sized ana$\log /$ digital deck is, however, part of the larger Philips DCC

However, those who've heard the early AC-3 demonstrations by Dolby and Pioneer are not all favorably impressed. Stereophile magazine recently called for a slowdown in the move to a new Standard, saying no data-reduction system should be adopted for LaserDiscs before it has been fully evaluated for audio quality. A Dolby
line being sold in Europe, which now includes more than a dozen models.

On the professional side, Philips is bringing in a DCC "cart" recorder, for radio-station use in recording and fastcued playback of commercials and other material. (Sony and Denon have already announced MiniDisc cart machines.) A DCC workstation for use with a personal computer has also been announced; it will permit editing with $8-\mathrm{mS}$ accuracy, and its PASC encoding system will allow storage of about two hours of audio on a 350-megabyte hard drive.


## Brief Notes Brief Notes Brief Notes Brief Notes Brief Notes Brief Notes Brief Notes

- Recoton is planning to market wireless headphones with noise cancellation. Just the thing for when your neighbor starts his mower while you're listening in your back yard.
- In Japan, JVC has announced "3DPhonic," an encoding system said to produce $360^{\circ}$ sound from ordinary stereo speakers. Music CDs using the system are already on the market, but the system may also be used for video games.
- The Summer Consumer Electronics Show, now renamed "CES Interactive" and moved from Chicago to Philadelphia, may face a snag. The Interactive Digital Software Association is endorsing a competing show, the Electronic Entertainment Expo, to run in Los Angeles on the same dates next May. Nevertheless, several major companies (including Thomson, Microsoff, Time Warner Interac-
spokesman has admitted that the demos given so far were not representative of what the system would sound like by the time it's introduced officially, in 1995. And Digital Theater Systems (DTS) says Dolby's system is fine, but DTS's rival digital encoding scheme (also being pitched for LaserDisc as well as theater use) is better.
tive, Toshiba, and WordPerfect) have signed up for the Philadelphia show.
- While Americans complain about the price of $C D$ s, people in other countries pay still more. As a result, people overseas buy fewer discs. In the U.K., for example, though about the same percentage of families have CD players, the average CD-buying family has about half as many CDs as its U.S. equivalent. Last year, this prompted Britain's House of Commons to condemn the music industry for overcharging. Now, however, Britain's Monopolies and Mergers Commission has found that much of the apparent difference is due to tax, and that other leisure goods show similar price differences between the U.S. and U.K. British paperback books, for example, offen carry such pricing as " $\$ 4.95$ in the U.S.; £4.95 in Great Britain."


At the Summer 1994 Consumer Electronics Show our brochure was honored with a major award. We are very proud and pleased, and would like to send you one. But we would point out that our cables are even better, and our cables have been receiving "note worthy" accolades for 15 years.
Yes, the humor in the last ad was deliberate. It was our way of making you smile - that is if you don't have Kimber Kable in your system... yet!

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# C L A S S I C A L $\begin{array}{llllllllll}R & E & C & O & R & D & I & G & S\end{array}$ beethowen quartets 



Beethoven: The Complete Quartets. Vol. VI, Op. 18 No. 3; Op. 131

Orford String Quartet
DELOS DE 3036, CD; 66:56.

Talk about international! This Volume VI of a complete set was recorded in Emmanual Presbyterian Church. Where might
 that be? Doesn't say. But the music was taken down in Canada, so might we infer Toronto? The familiar engineering team of Marc Aubort and Joanna Nickrenz is from New York. The office of the record company is on North Vine Street, Hollywood. Where, then, does the Orford String
absolutely wonderful sense! So it is with each succeeding generation.

It is safe to say that the string quartet has been the very essence and preservative of Western musical tradition in these last couple of centuries. Here are four players who no doubt were babies when I first heard Beethoven on 78 s as played by the oncedominant Budapest Quartet, the first group to bring us the great quartet literature in listenable audio. And yet, so much of the Budapest's strengths reappear here, after a lifetime has passed! The tradition among string players persists over time, almost unbelievably. Can't we realize that our present life is $99 \%$ tradition, passed on beyond present life?

Quartet hang out? Perhaps, like a quartet of quantum electrons, in some probability space, any old where from Hong Kong to L.A.!

Nevertheless, this is an excellent quartet, one of the best for Beethoven I have ever heard. The present volume contains the very first of his quartets, and the biggest of the famous Last Five, which, believe it or not, were so revolutionary that even unto my day, in the 1930s, a century after Beethoven, they were considered incomprehensible. Of course, when I heard them, as a student, they made student, they made


 from the ragically short recording career of the radiant cellist Jacqueline Du Pré-1961 through 1970. She seemed born to the cello from the time she first touched the instrument at age five, and died at the age of 42-debilitated by multiple sclerosis.

The reissues illustrate the wide range of her repertory, though Du Pré generally eschewed contemporary music. The Elgar concerto is most identified with her, and the Beethoven and Handel sonatas are standouts. Her tone is not as rich and singing as Casals' or Starker's but expresses great depth of feeling; Du Pré played like a soul possessed, and this is the heritage she left us.

John Sunier

The Orford Quartet plays in the essence of pure live-music tradition: They seem to know nothing of microphones and such but simply render Beethoven as they conceive it, live. That is an engineering problem for Marc A. and Joanna N., who have coped with it a hundred times before. Well done, and so you will notice only a tendency to lunge, to surge, suddenly loud and soft, which is hard for the mikes but well controlled.

Edward Tatnall Canby

## Songs by Gounod

Felicity Lott, Ann Murray, and Anthony Rolfe Johnson vocalists; Graham Johnson, piano
HYPERION CDA66801/2, two CDs; 2:16:20

It's a pity Gounod wrote Faust, since it seems to have eclipsed everything else he
did, even his deliciously poised songs. This addition to Hyperion's French Song Edition, replete with Graham Johnson's scholarly but utterly readable notes, will thus be for many listeners a worthy introduction to a musical terra incognita. Fortunately, Johnson is as fine an accompanist as he is an annotator, and all three of his singers are both expert and convincing. Others (notably Gérard Souzay) may have sung individual songs more sumptuously, but the standard here is certainly high. The
 songs on the first disc all were written in France and include all of his best (and best loved--even the Bachbased "Ave Maria"). The second mines his English period (1870 to 1873) and includes a song cycle in Italian


## Songs of Rossini

Arleen Auger, Jennifer Lamore, John Aler, and Steven Kimbrough vocalists; Dalton Baldwin, piano ARABESQUE Z6623, CD; 77:48

This would be an exceptionally satisfying recording even if it were not so well done and even if it were not a memento of the late and sorely missed Arleen Auger. She heads a mixed quartet that, with
 Baldwin's stylish and sensitive accompaniment, performs everything from the quartettino "La Passegiata" to the piano-solo introduction to Musique Anodine (six settings of Metastasio's Mi Lagnerò Tacendo). All are late Rossini (well, all but one) and almost all are from the famous but all too infrequently performed collection known as "Sins of Old Age." Sins, indeed! If these be sins, virtues are for the gods alone.

Almost all the music was written for performance at Rossini's celebrated Saturday soirèes-musically, the most brilliant in mid-19th-century Paris.

Even the young Wagner wangled an invitation to say grudging cour- to the maestro. This recording catches precisely the feeling he might hove encountered: Highly dramatic, witty music expertly performed with zest and panache in an intimate thouct suitably resonant aural ambience. Therein lies the unity of concept that makes the recording so satisfying. At the same time, the variety of voice and language ard musical thrust keeps it from ever dropping into routine. Kimbrough's baritone may sound a mite wooly in this glorious company, but never mind: It's a thoroughly cherishable disc. Texts and translations are supplied.

Robe tlong



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as well as a clutch of relative rarities with their original English texts. All in all, a more-than-welcome addition to the vocal catalog.

Robert Long
Ottorino Respighi: Piano Concerto in A Minor; Concerto in Mixolydian Mode Geoffrey Tozer, piano; BBC Philharmonic, Edward Downes
CHANDOS CHAN 9285, CD; DDD; 64:53

Dating from the young Italian's three years as first violist in the Russian Imperial Orchestra, the single-movement concerto pays tribute not only to the two famous piano concertos in the same key-Grieg and Schumann-but also to just about every musical tradition of late 19th century Germany and Russia. It shows Respighi's fine ear for mood and color beyond virtuosity.
The other concerto comes from the height of Ottorino Respighi's popularity, when Toscanini premiered the latest of the "Roman" tone poems. Though Respighi
 felt it would be the most famous of his works, this concerto, based on a medieval church mode, never caught on with audiences. Though the music may be nostalgic, neither the performances nor Chandos' rich sonics sound dated.

John Sunier

## Paul Schoenfield: Four Parables; Vaudeville; Klezmer Rondos

Wolfgang Gasch, piccolo trumpet; Carol Wincenc, flute; Jeffrey Kahane, piano;
The New World Symphony, John Nelson ARGO 440 212-2, CD; DDD; 71:53

This brash young composer is part of a growing group inspired by the broadest musical spectrum imaginable-pop (both foreign and American), folk, jazz, and more traditional classical music of the past.

For example, "Vaudeville" (a concerto for piccolo trumpet and orchestra) is Schoenfield's homage to Robert Schumann's piano suite "Carnaval." He mixes the sounds and moods of vaudeville theater with Eastern European klezmer music, a clown routine and even the Brazilian folk song "Tico-Tico."

The Four Parables are based on life encounters the composer had. The finale,

Dog Heaven, is a sprightly fantasy about "a jazz club in a place where the streets are lined with bones and there is a hydrant on every corner." Schoenfield's music is so
 wild, raucous, and unexpected (though generally tonal) that one may berate oneself Waving so much fun hearing it! It's also written for, and recorded with, often astonishing variations of frequency and dynamic range.

John Sunier

## Sierra: A Joyous Overture; Tropicalia; Idilio; SASIMA, and Preámbulo

Milwankee Symphony Orchestra and Chorus, Zdenek Macal
KOSS CLASSICS KC-1021, CD; DDD; 55:23
Contemporary Puerto Rican composer Roberto Sierra was the Milwatukee Symphony's composer-in-residence for three seasons, so these works are not just a read-through for the performers. He molds Caribbean and Latin American folk
music into traditional symphonic form, making an exciting and very accessible musical language.

The Joyous Overture refers to two recognizable phrases from Beethoven's Ninth Symphony-thus the "joyous" connection. "Tropicalia" is in three movements exploring magical and sensual aspects of the Caribbean:
 Foliage (a weaving of tangled melodic and rhythmic patterns), Nocturne (tree frogs

> ROBERTO SIERRA MOLDS CARIBBEAN AND LATIN AMERICAN FOLK MUSIC INTO TRADITIONAL SYMPHONIC FORM.
and fireflies inspire this dream-like section), and Celebration (a colorful dance feeling). "Idilio" recreates a primal rain forest with a wordless chorus, and in the

Hovhaness: Symphony No. 25, "Odysseus"; Symphony no. 6, "Celestial Gate"; Prayer of St. Gregory Polyphonia Orchestra, Alan Hovhaness CRYSTAL CD 807, CD; 60:02

Crystal Records has taken on an interesting project in its growing Hovhaness series, some reissued from 1970s LP, others new. Hovhaness is decidedly at his best in orchestral music, such as is heard on this recording (also a number of others similar). The sound, emphatically, makes good audio; it's ideal for recording, sumptuous in the reproduction. Thus he is one of our own most important "classical" composers, for our own special audio reasons.

In the monochrome piano form, as per my unenthusiastic review in the October 1993 issue, the stylistic mishmash of his material is accentuated, minus the arresting colors and moods of his unique orchestral sound. Hovhaness is not exactly modesthe has written in every medium you can

imagine, and often with the same mixed effect, even garishly so. But he remains a strong composer, and the strength comes out in his orchestral and similar worksworks for brass, for instance.

Such a bundle of paradoxes! Always a mystical sound, composed to thought, stories, and legends from exotic sources including the composer's own fervid imagination. And always the standard Western instruments out of his home territory, Massachusetts. Thus for the "Odysseus" Symphony, he says, "Since I was nine years old I have had a tremendous love for Homer's Odyssey. This work opened great vistas to me...the sensation of traveling great distances out into the universe or through strange mountainous countries on what seemed like bridges of gossamer threads." Out of this, a symphony, no less. And with "characters" too, the adventurous Odysseus and his stay-at-home spouse Penelope, easily heard as a flute solo and close-harmony strings! In Hovhaness, far-flying thoughts turn into highly performable sounds. Edward Tanall Canby

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## Sergei Rachmaninoff: Concerto

Elégiaque for Piano and Orchestra in D Minor; Variations on a Theme of Corelli; Vocalise
Alan Kogosowski, piano, Detroit Symphony Orchestra, Neeme Järvi
CHANDOS 9261, CD; DDD; 68:44
Both major works here are very recent orchestrations of Rachmaninoff's originals and both are world premier recordings. The piano concerto comes from Rachmaninoff's Trio Elégiaque, which the composer revised more than once but failed to solve the fact that it burst the bounds of chamber music form. Alan Kogosowski has remedied that with this spectacular orchestra-
 tion, in which he then performs the solo part. An early work, it shows many of Rachmaninoff's hallmarks: Orthodox chants, ringing bells, Russian folk melodies.

The Corelli Variations was originally a solo piano piece, not influenced specifically by that Baroque composer so much as by the main theme, the ancient melody "La Folia." This piece presaged Rachmaninoff's great Rhapsody on a Theme of Paganini. Corneliu Dumbraveanu, a Rumanian conductor, has fashioned a stimulating orchestral work from the piano original, and the combination of Järvi's expert forces and rich recorded sonics make for a synergistic success. The Vocalise encore is arranged for orchestra alone from the soprano with orchestra original.

John Sunier

## Schubert Songs for Male Chorus <br> Robert Shaw Chamber Singers, Shaw TELARC CD 80340, CD; 62:22

For those who associate Robert Shaw with legions of large-scale choral recordings on Telarc, this wonderfully modest and dedicated male group of his, singing Schubert, is a rare surprise, though Shaw has staged some of these works on and off

# Berlioz: Lélio: The Return to Life 

 Glenn Siebert, tenor; William Diana, baritone; Werner Klemperer, narrator;' Milwaukee Symphony Orchestra and Chorus, Zdenek Macal, conductor KOSS CLASSICS KC-1017, CD; DDD; 51:56"Lelio" is the seldom-performed second half of Hector Berlioz' massive "An
 Episode in the Life of an Artist," of which the popular Symphonie Fantastique is the first half. No wonder it's not performed much; this work has some lovely Berlioz music in it but much of it is a mad prose tirade that to today's audiences-separated by more than a century and a half from the sensibilities of the Romantic period-seems almost laughable.
The Milwaukee forces put everything they've got into this odd duck, sonics are excellent, and it's a welcome addition to the catalog. But I'm glad I needn't sit all the way through it in a concert hall. A primary attraction of this recording is that in previous versions the narration was in French. The English presented here is a commendable improvement in communication, at least to me. The solo and choral selections are still in French-including the Goethe lyrics and Shakespearian material from The Tempest-but Koss has thoughtfully provided good translations.

John Sunier
during his long career. Those who have discovered the eternal magic of the compos er-once trapped you're in for life-will find the recording an unexpected pleasure, perhaps into new and unexpected Schubertian territory. (In the playing I was knocked over by several songs I ran across that I had conducted or sung myself years back. They really grab you, these pieces, like so much else by the composer.)

There are unusual problems in "staging" th is music. The tenor lines, both chorus and solo, are extraordinarily high, requiring, in effect, all countertenors. In addition, I might note, Schubert's standard
pitch was sensibly below ours of A 440, which jacks the music even higher. The composer had sung as a boy in what became the still existing Vienna Choir Boys (the Imperial Choir) and this could have had to do with the high tessitura, the musical altitude, available from the singers who performed with him. Today's countertenor sound, a type of singing that reappeared only a few decades ago, is mainly centered on much earlier music (with a style that may or may not be that of older times!) and so seems vaguely out of place in this more recent Romantic idiom, the early 19th century. At least as we hear it. The main soloist, Karl Dent, is a countertenor, not a standard 20th century tenor, and this may bother a few listeners. Other than that he is excellent, as are two other soloists, another (high) tenor and a mezzo-soprano (a "middle" soprano). Modest accompaniments, guitar or piano, go with some of the song; others are unaccompanied.

The works, all very Schubert, nevertheless range over a lot of Romantic territory from simple ditties to lengthy works with many verses, elaborate (and difficult) harmonies in the most profound Schubertian
 mode. If only there were more flexibility in rhythm and tempos! It's all too much alike.

The smaller the group, the less the conductor has to do. This highly expressive group could easily sing without one. Shaw's role here, aside from his enterprise in organizing and rehearsing the music, is somewhat negative. He prefers very slow tempos, all the same throughout; or fast in a sort of dog trot-the more sprightly pieces jog rather than dance as they should. Not flexible. It is the singers who keep things moving and responsive to the composer. Shaw could also have done more to untemper the odd Schubert harmonies, which typically sound slightly out of tune when unaccompanied. They can be retuned, each of them, if the singers understand the demands of tempered pitch and Schubert's piano-oriented mind. No signs of that here, though it makes only a microdifference, to be sure.

As you listen, remember that the Schubert disease is slow to infect. Give him time! You won't regret it. Edward Tatnall Camby


## VOODOO LOUNG ROLLING STONES

VIRGIN 39782-2, 62:10

The first Stones album under their new Virgin Records deal is a winner, easily their best and most compelling album since 1978's Some Girls. Considering the spotty nature of their output since then, this could be taken as faint praise.

But it's not meant to be. Voodoo Lounge has a lean, hungry sound and feel that must, at least partially, be attributed to co-producer Don Was, who always seems to bring out the best in whatever artists he works with.

Some songs have a familiarity built in. "Love is Strong" rephrases the melody of "Gimme Shelter." "You Got Me Rocking" sounds like the verse of "Brown Sugar" with the chorus of "When the Whip Comes Down." "New Faces" seems to wed the harpsichord of "Lady Jane" with (of all things) The Eagles' "New Kid In Town." "Sweethearts Together," featuring Flaco Jiminez on button accordion is like a Tex-Mex take on

"Dead Flowers." And despite these echoes of past glories, Voodoo Lounge still sounds fresh and vibrant.

Old war horses they may be, but Voodoo Lounge proves that life still remains in the Stones. It's evident in their experimentation with new sounds like Flaco's accordion, Frankie Gavin's Irish fiddle in "The Worst," and Mark Isham's trumpet on several cuts. These new songs, while delivered in a familiar vocabulary, are imbued with a fresh slant. Most importantly, everything (album, band, songs) sound like vintage Rolling Stones-often imitated yet never duplicated.

## Harbinger

Paula Cole
IMAGO 72787-21018-2, 58:20
Paula Cole writes detailed songs of life's exigencies; of mothers who got trapped in family life before they found their own lives, or of young girls who retreat to fantasy worlds to
 escape their pain and loneliness.

Cole follows the confessional/psychoanalytic path of Tori Amos, among others. She takes us back to schoolyard jeers on "Bethlehem," contrasting her hometown of Rockport, Mass. against the birthplace of Christ. And she extolls the strength of her mother on "Happy Home" and "Watch the Woman's Hands," with a muscular music and moments of redemption and courage.

Musically, Harbinger is inventive, with mock beat-box thythms and the morphing guitar backings of Gerry Leonard and Kevin Barry, along with production by Kevin Killen lending texture and depth. Her social commentary on "Hitler's Brothers" and "Our Revenge" is heartfelt but sounds like simple sloganeering next to her more personal
revelations like the date-rape of "She Can't Feel Anything Anymore," or the tale of crossracial love on "Chiaroscuro."

Ultimately, it's Cole's singing-a powerful voice with some subtle twists and leaps-that drives her songs home.

John Diliberto

## King of California

Dave Alvin
HIGHTONE HCD 8054, 54:57
The former Blasters guitarist and songwriter turns in a low-key acoustic affair for his fourth solo recording. This approach gives his gruff vocals room for comfort, allowing him to really caress the lyrics for the first time on record, thus making King of Califormia his best solo work.

Included with a batch of new tunes-particularly the standout title track-are some old ones too, such as Blasters favorite "Border Radio" (the second time Alvin has done this one solo) and "Every Night About This Time," and
 some good covers as well, such as Memphis Slim's "Mother Earth," Tom Russell's "Blue Wing," Whistlin' Alex


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Michael Tearson

## Seducing Down The Door: A Collection 1970-1990 <br> John Cale

RHINO R2 71685, TWO CDS, 2:34:00
Before co-founding the Velvet Underground, Cale tested the avant-garde waters with minimalists like John Cage and La Monte Young. And following his Velvet Underground tenure, he began a multifaceted solo career. Post-modern classicist, romantic poet, gritty rock 'n' roller, and violent con-
frontational thrasher, Cale is all of these and more-often several at once.

The 38 selections here date from 1970 to 1990 , and they paint a rich picture of a rest-
 less artist who always was driving to the limit. Though his settings range from orchestral to soft art-pop to abrasive, full-throttle rock-out, Cale's vision is the unifying factor. Never as popular or as high profile as fellow Velvet Underground mate Lou Reed, John Cale remains at least as valuable and important. This retrospective of his
music gives an excellent and generous overview. Also recommended is Reprise's recent reissue of Paris 1919, Cale's masterwork.

Michael Tearson

## Plugged In <br> Dave Edmunds <br> PYRAMID/RHINO PRCS 71770, 42:35

With Plugged Ih, the major attraction here is that Edmunds is playing every instrument, which means that there's plenty of his firstclass guitar work. And he delivers a song like "Standing at the Crossroads"-one of his best performances ever-in a way that'll have you thinking he's one of the all-time greatest rock artists on the planet. Yet much of this album Of all the arts, none is more characteristic of the divine than music. For trousands of years, angeis have been a PERSISTENT IMAGE AND INFLUENCE IN human life. This special coliection of MUSIC IS INSPIRED by the reace, beauty,
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may also convince you that he's just merely a hack. Some songs simply aren't up to snuff and the drum machine is on auto pilot. Although one half
 of this album redeems the other half, Edmunds needs to strike back with an entire album of great songs, not just a few, and he's definitely capable of this. C'mon Edmunds, you can do it! Jon \&ally Tiven

> THE FUTURE SOUND OF LONDON REVELS IN SUDDEN, STRUCTURED CONTRASTS.

Lifeforms<br>The Future Sound of London ASTRALWERKS/CAROLINE ASW 61132 , two CDs; 1:32:33

The Future Sound of London does something that many ambient electronic bands don't. They create structure and melodies, tension and release, and theme and variation. Unlike the often random collages of The Orb, who sound like they've inserted a shuffle-play
 mode into their samplers, F.S.O.L revels in controlled juxtapositions and sudden shifts of contrasts and spacing.

I'm not sure that anything on this album is actually played. It all seems comprised of lifts from discs by Klaus Schulze, Robert Fripp, King Crimson, Herbie Hancock, and other sources. But F.S.O.L creates a techno-organic whole out of these electronic scribbles, plucked acoustic guitars, and ethereal voices,



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marrying them to insistent but never oppressive rhythms. Their excursions pick you up here and drop you off somewhere else, where you wait for the next ship to pull out for destinations unknown. This is the station stop that Pink Floyd passed by while rocketing from Meddle to Dark Side of the Moon.

John Diliberto

## Bewitched

 LunaELEKTRA 61617-2, 45:24
Luna's shimmering pastiche is largely based on simple but melodic riffs reminiscent of Velvet Underground and early Grateful Dead. It's a reference that served guitarist/vocalist/lyricist Dean Wareham well during his tenure with the Boston outfit, Galaxy 500.

On Luna's second record, chiming and dynamic guitars-occassionally offset with cheezoid distortion-dominate the edges of the mix. And Wareham's laconic vocals, which cross Pearls Before Swine with Jerry Garcia using Dead-like harmonies, while lacing Kerouac-ian songs of the road and cheap motels with a gift for offbeat narrative a la Lou Reed. Despite generous
allusions to the past, Luna still manages to sound fresh; the darker side of the ' 60 s as anthem for the X Generation. Former Velvet Underground guitarist Sterling Morrison guests on two tracks.

Michael Wright

## Arborescence

Ozric Tentacles
I.R.S. 7243829486 29, 49:18

They've been called throwbacks to another psychedelic era. Really, though, Ozric Tentacles come from the post-psychedelic space-music continuum populated by groups such as Gong, Hawkwind, Among
 Duul II, and Can. After some 14 records released independently (and successfully) in their native Britian, Ozric Tentacles remains a merging of space music with high-energy fusion in which blistering, morphing guitar solos, tricky time signatures, modal themes, and gurgling, whooshing synthesizer scrawls result from a crazed virtuosity.

Part of the Ozric charm is that technologically, they never look past 1978 with their analog synthesizer arsenal. They've picked up where Gong and Steve Hillage left off around 1976, adding a bit of Reggae-dub sensibility
(itself a psychedelic aesthetic) and mock Persian dervishness. A heady brew in every sense of the word.

John Diliberto

Anthology<br>P.F. Sloan<br>ONE WAY/MCA MCAD-22097, 53:15

The P.F. Sloan cult has only grown since the days when folk-rock ruled, and Anthology finally makes songs like "The Sins of a Family," "Let Me Be," and the classic "Eve of Destruction" available in their auteur versions. Although the arrangements were a bit light even in their day, Sloan's songs and vocal performances have only gained a wider appreciation in the nearly three decades intervening. With 18 songs and almost an
 hour of music, this is quite a bargain, and those who search the racks for the new Dylan might be well-advised to go no further. Philip Sloan ranks as one of the great songwriters of all time. The only criticisms are that three of Sloan's best songs-"I Get Out of Breath," "From a Distance," and "When the Wind Changes" are excluded, and the liner notes could be considerably more extensive considering this guy's history. Jon \& Sally Tiven


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Stones, which is the best of the whole lot. The arrangements are clever and The London Symphony Orchestra excellently supports vocal turns offered by Clannad's Maire Brennan ("As Tears Go By"), Marianne Faithful ("Ruby Tuesday"), some guy
 named Jagger ("Angie"), and others. Aboud Abdul Al's violin playing on "Paint It Black" delivers a delightful gypsy turn. Several different choruses appear on a few songs with The New London Children's Choir \& The London Voices adding great touches to "Sympathy for the Devil" and "Gimme Shelter," while The Ibstock Place School Singers do the same for "Dandelion." Dolby Surround adds yet another dimension to this great recording.

Michael Tearson tling acoustic Ric Ocasek doing "Just What I Needed," and Lucinda Williams' tender ver-
sion of Dylan's "Positively 4th Street." Needed," and Lucinda Williams' tender ver-
sion of Dylan's "Positively 4th Street." Recording quality is occasionally a bit weak, but the performances easily compensate. Each song is preceeded by the artist's own commentary and introduction. Michael Tearson

## Symphonic Music of The Rolling Stones

Various Artists
RCA 09026-62526-2, 52:07
RCA has previously released orchestral adaptation albums of music by various rock
bands, including Jethro Tull (quite good), Genesis (fair at best), Yes and Pink Floyd (both horrendous), and now the Rolling and artists are encouraged to join in on the others' selections. This is the first release in Razor \& Tie's series of recorded highlights. Some of the best offered here are Dion's "King of the New York Streets," Dave Alvin's Civil War epic "Andersonville," the late Arthur Alexander performing "Anna," a star-
premise with a concert series at New York City's famous Bottom Line club. On a particular night, four singer/songwriters take turns singing their songs in an intimate acoustic setting before closing the evening with a round of covers. These are usually lively affairs where surprises can and do occur,


## In Their Own Words, Volume 1 RAZOR \& TIE RT 2813, 69:21

In Their Own Words shares its name and


MTV Unplugged: Tony Bennett (Columbia CK 66214, 63:12). A fabulous show! Bennett gives an assured bravura performance with support from the very cool Ralph Sharon Trio he's emplayed for ages. Currently a hot commodity with the younger set, it makes sense that k.d. lang and Elvis Costello join for a pair of swell duets.
M.T.
boards, guitars, and a variety of percussion. But three selections feature vocals by Nelson, occasionally with St. John. Most notable of these is the bubbly pop song "Testify" and "Thunderous Accordions," with Nelson growling like vintage Roger Waters. Still, the real grist of this project are instrumentals which are far more insistent than so-called New Age music. They have strong melodicism, intriguing sound designs, and unusual instrumental combinations that compe some very attentive listening. Automatic has some real substance, ard you should give it a listen. Michael Tearson


See Part II of the exam on page 69 and Part Ill on page 71. For additional information call

#  

## GINGERBRER

\author{

- Going Back Home
}

Ginger Baker Trio
ATLANTIC JAZZ, 82652-2, CD; 45:10 Sound: A, Performance: A

For those who thought that the formef Cream drummer was only about slamming backbeats (the kind that producer Bild Laswell relegated him to on 1990's Horses and Trees and 199I's Middle Passage), guess digain. This cat can swing with the looseness, agility, and assuredness of someond like Elvin Jones. Not quite as sly and merfcurial as Roy Haynes, perhaps, but swinging nonetheless.

This session harkens way back to Gin*er's pre-Cream days in London-circa 1963 -with the Graham Bond Organization, when lee was swinging on standard fazz fare like Sonny Rollins' "Doxy" and Niles Davis' "So What" alongside his mates Jack Bruce, joln Mchaughlin, and saxophomist Bond.

The line up here-Baker on drums, Clarlie Haden on bass, and Bill Frisell on gutitar-is no small coup for producer Chip Stern. The three exhibit an uncanny chemistry on al set of originals and interpretations of (Ornette Coleman's "Ramblin"" and Thelonious Monk's "Straight No Chaser:"

Haden, a veteran of vilmage Ornette ensembles, holds things rogether with his deep-toned, less-is-more approach. He's


When The Moon Jumps Ken Schaphorst Ensemble ACCURATE AC-4203, 60:10

chaphorst, a trumpeter and educator (director of Jazz Studies at Lawrence University in Wisconsin), has a measurable if not long involvement with big bands. Cutting his chops in the Boston area, he became a primary force in that city's Jazz Composer's Alliance, a musician co-op of
sorts that united some of Beantown's most progressive musicians. Among his Boston colleagues are veterans of the Either/Orchestra and its leader, Russ Gershon, who created Accurate Records.
 lenging pieces. Included are reworkings of "All The Things You Are" and Dizzy's great "Con Alma," the latter featuring reggae underpinnings. There's also the "Concerto for John Medeski," a

Schaphorst's third for the label, When The Moon Jumps is a pastoral, in-depth work of substance. In lieu of a full-blown big band, which constituted his first two recordings, he's pared down to a 10 -piece ensemble that offers a series of seven quite chal-

National Endowment for the Artscommissioned effort titled for and featuring the ensemble's pianist.

Included in Schaphorst's rhythm section (in addition to Medeski, bassist Chris Wood, and a pair of percussionists) is guitarist John Dirac.

# Part Two TRUE OR FALSE 

Trombonist Curtis Hasselbring, altoist/clarinetist Douglas Yates, and trumpeter John Carlson-all of whom have Either/Orchestra experience-contribute to the front line.
Similar to records from that esteemed outfit, When The Moon Jumps is unmistakably a jazz record, although one that very successfuily blurs many definitive musical lines.

Jon W. Poses

## This Land

Bill Frisell
ELEKTRA/NONESUCH 9-79316-2, 65:58

Among the inspirations that echo through
 guitarist Bill Frisell's latest musical landscape is that of Aaron Copland. But where Copland's portraits of America conjure up images of majestic plains, Frisell's looks more like the Mississippi railroad station depicted in Walker Evans' 1936 photo used on the CD cover-stately with mundane detail, yet somehow unreal. There's always been a sense of unreality or, at least, deep irony in Frisell's music, accomplished not by waves of distortion but through subtle fuzztones and twangy interpolations; his axe has always been a multi-purpose tool. For his new band, Frisell augments his trio (made
up of drummer Joey Baron and bassist Kermit Driscoll) with alto saxophonist Billy Drewes, trombonist Curtis Fowlkes, and clarinetist Don Byron. Together, these musicians bring sharp focus, rich detail, and a powerful sense of perspective to Frisell's vision.

Larry Blumenfeld

## $K^{\prime} b^{\prime} \mathbf{M o}^{\prime}$

OKEH/EPIC EK 57863, 44:00

The newly revived OKeh imprint has debuted with several quirky acts, none more fun or impressive than Keb' Mo', who with bluesy songs, a National acoustic guitar, and husky vocals is very reminiscent of early Taj Mahal. Like Taj, Keb' is wellversed in blues tradition and is clever enough to put a twist on it. This is best illustrated in the jumping arrangement of "Come On In My
 Kitchen," one of two Robert Johnson songs here. And Keb's well-crafted originals quickly stamp him as his own man. A sparse band featuring the great James "Hutch" Hutchinson on bass adds sprightly supple support. John Porter's production is appropriately light-handed, lending the album buoyancy and zest without adding any superfluous baggage along the way.

Michael Tearson

> Shuggie's Boogie
> Shuggie Otis
> LEGACY/EPIC EK 57903, 52:02

In the latter part of 1969, a phenomenal 15 -year-old blues guitarist cut tracks that were released on Epic as Al Kooper Introduces Shuggie Otis and Here Comes Shuggie Otis. The kid cooked with the seasoning of a chitlinscircuit veteran, showing the influence of his heroes T-Bone Walker, B.B. King, and Lowell Fulson, while no doubt also flaunting some lessons learned from his father, junrip-blues bandleader Johnny Otis. Impossible though it seemed, this young sprout was the real deal, play. ing with the kind of guts and fully developed soulfulness that belied his age.

Shuggie's introduction was somewhat overshadowed by Johnny Winter, who was Columbia's big blues signing that same year. But his records caught the attention of perceptive critics and have remained in the hearts of serious blues collectors for the past 25 years. A few of those golden oldie tracks have surfaced again as part of Sony's Lega-
cy series. Along with the super-slow "Gospel Groove," the funky 'Bootie Cooler," the Delta-flavored "I Can Stand to See You Die," and the autobiographical "Shuggie's Boogie," in
 which he talks about and mimics his guitar influences. Shuggie's Boogie also includes select tracks from his 1971 album Freedom Flight, as well as the previously unissued B.B. King-inspired original, "Cold Shot."

A 17 -year-old Shuggie testifies passionately on the slow blues "Purple," striking a perfect balance between pafience and power. On "Sweet Thang" he conjures a hoodoo vibe with some haunting slide guitar work. Arc with some sonic processing on "Shuggie's Old Time SI de Boogie," he summons up the crackly sound of a late 1920's guitar-piano duet.

This perfectly-timed reissue could jump-start a long overdue comeback.

Bill Mikowski

$\qquad$

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## See Part I of the exam on page 67 and

 Part III on page 71. For additional information callReal Book<br>Steve Swallow<br>\section*{XTRAWATT/7 78118-23207-2, 49:41}

Real Book? Real Deal would've been more correct. For Real Book, Steve Swallow, the bassist most associated with Carla Bley's projects, has assembled an incredibly forceful quintet. Joe Lovano and Tom Harrell share the front line and both are in full
 stride, noticeably on the freewheeling "Bite Your Grandmother," the more controlled
medium tempo "Thinking Out Loud" (which features Harrell on flugelhorn), or the Latininfluenced "Let's Eat," which allows Lovano to strut his stuff.

Meanwhile, pianist Mulgrew Miller has never been pushed harder and in so many different directions. The depth and musical scope of Real Book could almost suffice as his resume, proof why many consider him to be the best keyboardist of his generation. None of the 10 Swallow compositions-and a diverse lot they are-seems to phase him. He devours everything thrown at him, which includes ballads, bossas, tangos, straight-ahead, you name it.

The final part of this equation is the planet's ultimate crash-and-burn drummer, Jack DeJohnette. He and Swallow are locked in from the start. And the piano-bass-drums trio interludes, which take place periodically throughout the album, are a bonus that compliment the real backbone of this date-the consummate ensemble work. In the end, nobody gets cheated here. Real Book stands as one of the year's best.

Jon W. Poses

## Is What It is <br> Mike Stern <br> ATLANTIC JAZZ 82571-2, 56:37

After an inspired flirtation with standards on his last recording, Mike Stern returns to the comfort zone on Is What It Is, aiming his Telecaster at nine contemporary jazz originals. It's a sinuous and bluesy result-often set to ambitious meters-that mixes Stern's signature fluid guitar runs featuring syncopated, interval skips with tempestuous improvs, acoustic ballads, and one ripping rocker. Swapping leads with saxophonists Michael Brecker and Bob Malach, Stern seems intent on exploring tension and release, pacing solos in ever more complex variations before coming home to their melodic roosts. All the while, he's clever and cool-skirting the edge without going over.

Michael Wright

## Portraits in Ivory and Brass <br> Jack Walrath o Larry Willis <br> with Steve Novasel <br> MAPLESHADE 02032, 68:58

Portraits is an inspired, lyrical duo collaboration between two New York jazzmen, both of whom are trained in the classics and have the chops to play just about anything.

Trumpeter Walrath is perhaps best known for his mid-'70s tenure with Charles Mingus. He's also recorded 20 albums as a leader. Willis has toured and recorded with some of the greatest names in modern jazz, including Miles, Dizzy, Cannonball and Nat Adderley, Jackie McLean, Stan Getz, and Art Blakey.

Together, and with bassist Steve Novosel contributing on four cuts, they cover one standard ("Bess, You Is
 My Woman") and offer seven co-authored originals. "Kirsten" is a delicate and moody jazz waltz, "Shadows" is a tribute to Miles, and Walrath's witty sensibility is evident in the tip of the hat, "Monk's Feet."

This duo is both playful and thoughtful, and Mapleshade's simple purist analog recording methods preserve the simplicity of the sonic interplay.

John Sunier

## Solomon's Daughter

Franklin Kiermyer Quartet Featuring Pharoah Sanders
EVIDENCE ECD 22083-2, 59:05

If you hadn't heard of Franklin Kiermyer until now, well, you needn't have. On his first U.S. release, Kiermyer explodes
 with a passion that has largely kept him off the scene, woodshedding and focusing instead on his own expression of what he calls "Ecstatic American Music." This heady moniker may be off-putting, but it is more accurate a description of Kiermyer's motives than are terms like "free-jazz" or "avant garde." While it's comfortable-and sim-ple-to compare the quartet's approach here to Coltrane's legendary quartet with Tyner, Jones, and Garrison, the reference does little to get us inside Kiermyer's music. Together with saxophonist Pharoah Sanders at the top of his form, he calls forth many spirits, among them-yes-

Beauty Within<br>Edward Simon Group<br>AUDIOQUEST AQ-CD 1025, 51:28

Venezuelan-born pianist Edward Simon is best known for his role in Bobby Watson's
 post-bop quintet, Horizon. In that context, Simon is usually an introspective player and a quiet accompanist. Yet Beauty Within arrives like an awakened, unleashed lion. "Wait until my CD comes out," Simon told me some months back. "It's a whole different sound." And he's right.
On Beauty Within, his first session as a leader, it's as if the 24 -year-old pianist let go of everything he's held in check until now. This stands as a dynamic presentation, one that showcases a more extroverted, startling, and expressive Simon who obviously can play with a great deal of zest and passion.

Working predominantly in trio (occasionally adding the sometimes muted but always tasteful trumpeter Diego Urcola), Simon employs a great many rhythmic approaches, in varying degrees, each episode taking full advantage of his Venezuelan upbringing and previous Afro-Cuban and classical experiences. The range of tempos, moods, and colors from each self-penned selection to selection is executed with a great deal of purpose and maturity.

Coltrane. And along with pianist John Esposito and bassist Drew Gress, Kiermyer stretches and molds the rhythms to suggest a musical vision that is as personal as it is revelatory.

Larry Blumenfeld


Bassist Anthony Jackson and drummer Horacio Hernandez provide Simon with the necessary support. They actually create an avenue of freedom for Simon who, in turn, does not let opportunities slip by. Jon W. Poses

Breath of Life World Saxophone Quartet with Fontella Bass<br>ELEKTRA/NONESUCH 79309-2,45:46

Breath of Life is another, yet more subtle, direction for The World Saxophone Quartet (Hamiet Bluiett, Arthur Blythe, Oliver Lake, and David Murray), who in recent years have devoted entire albums to collaborations with African drummers or covering
 the repertoire of Ellington or R\&B chestnuts.

The Quartet appears alone on only two tracks; all else features accompaniment. Of obvious note is the presence of Fontella Bass who sings on three tracks, including the Oliver Lake-composed title cut. A curve-ball is the Eddie Arnold country song, "You Don't Know Me," in an R\&B style by Bass and the Quartet. Also prominent is an organ (played by Amina Claudine Meyers or Donald Smith) on this and other tracks, notably the lovely ballad, "Song for Camille." Two basses, one arco and one pizzicato, also distinguish this track.

John Sunier

## PART THREE EXTRA CREDIT

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See Part I of the exam on page 67 and Part ll on page 69.

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Each year in this introduction to our Annual Equipment Directory, I list counts of makers and models in the different equipment categories. Aside from the totals for the current year, I also give information on whether tallies have gone up or down. I hasten to say that I do not think there is a very strong direct correlation between the number of models in a category and the number of pieces actually sold. In fact, these two figures might even move in opposite directions.

$h$owever, I do think the moves in a category's numbers of models do say something about the makers' enthusiasm for their certain part of the audio business, particularly if these moves go in the same direction year after year. Let me say this a different way: If the number of speaker models jumps by, say, $25 \%$ from one year to the next, then the speaker makers think that's a good business to be in. And, clearly, so do their investors, usually banks. Further, if the number of speaker models jumps for two or three (or more) years in the same way, then it seems pretty likely to me that speaker-making IS a good business to be in. And, particularly so, if the guys with lots of models keep adding to their totals.

There are other factors to consider in deciding whether to be in the speaker-making business, aside from the number of competing models in the category. One is percentage profit desired or needed on each system, and to some degree this determines the type of distribution. That is to say, high profit margins are usually images in the minds of dealer and consumer alike. Low profit margins are associated with equipment that is more like a commodity, i.e., without many features unique to the brand.

Before I get to the numbers, let me point out that the numbers in the tables are NOT the result of our measurements, but rather ones we've gotten from the makers.

peakers is again the largest category in the Directory; we are up by 278 to 2,832 models. While the pages taken up by the category are down by more than 10 , the increased density is through the welcome efforts of our Associate Art Director Linda Zerella and Directory Editor Ken Richardson. The number of speaker makers is, however, down by one to 340 .

Amplifiers is again this year the second largest category at 818 models from 215 companies; that's up 127 models and 22 companies. Preamps was up too, by 72 models to 485 from 186 firms, which is up by 23 . Headphones has made another large increase, by 64 models to 348 , from 35 companies, which is up four.
The LP area appears to be making a comeback in that turntables are up two to 112 from 41 makers (seven more), tonearms are up five to 42 from 22 makers (up two), and phono cartridges are up 20 (!) to 212 from 38 makers (up six).
There are several people I need to thank for undergoing months of eyestrain in dealing with small type and confusing handwriting to produce this Directory: Kay Blumenthal, Managing Editor; Cathy Cacchione, Art Director; Linda Zerella, Associate Art Director; Ken Richardson, Directory Editor; Gerald McCarthy, Assistant Editor; Noel Farmer, Chief Directory Slave, and Clint Vriezelaar, Assistant Directory Slave.-E.P.


The precision CD belt drive is so unique, it's patented.

Jitter. More than a buzzword, it causes your CDs to sound, well...digital. And it took C.E.C. to seriously address its fundamental causes.

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You see, all other CD transports use a high-torque moror with the disc perched directly on the spindle. Its miniscule bearings can only support the scant weight of the $C D$ - which,

## Why You Should Spend Thousands On A CD Transport BuIlt Around A Rubber Band.

in itself, is prone to warping and resonances. The resulting microvibrations contaminate the data stream with jitter.

So, how does the TL 1 minimize jitter? C.E.C. uses a smooth-as-silk, low-torque motor isolated by a drive belt. This allows an independently suspended bearing to support an enormous CD stabilizing clamp - with over 26 times the rotational inertia of the typical transport. Inspired by the great analog turntables, the TL 1 combines massive amounts of steel, aluminum and brass to weigh a rock-solid 38 pounds.

Bob Harley of Stereophile sums it up nicely, "The C.E.C. is unquestionably a remarkable transport. Its smoothness, ease and liquidity set a new standard in digital playback.
"I can enthusiastically recommend the C.E.C. TL 1. It is not only an eminently musical transport, but also a gorgeous - and innovative - piece of audio equipment."
To fully appreciate the sonic virtues of the TL 1, visit your C.E.C. dealer and hear the finest CD transport in the world - built around a rubber band.


PARASOUND

## CD PLAYERS \& TRANSPORTS



## Hear the music, not the machine.

Has listening to musi=
recorded on CD's become an
uninspired routine ins:ead of the releasing experience it once was? Maybe
it's because you're hearing more of your digital playback machinery and less of the music. In an era when most CD players and transports offer the same bland. assembly-line sonic experience, Audio Research is proud to annolnce two new products which serve the music instead of digitally enslaving it.
The CDT1 compact disc transport and the CDI compact disc player both use innovative engineering-along with patented Audio Researcin circuits-to bring you higher resolution from the compact disc medium than you've ever encountered before. This new standard of performance is due ir part to more effective mechanical isolation and electronic elimination of digital jitter-the electronic entropy that drags on laser servos. error-correction circuitry and power supplies to hold back the full reproduction of a life-like musical experlence. (Hence the flat. dimension-less sound of much previous CD sound.)
Add Audio Research's advanced, highly regulated power supplies and, in the case of the CD1,

an innovative analog stage with low-impedance output drive and you have two machines which honestly advance the state of the art in music reproduction from CD sources. Both transport and player offer a full conplement of digital output options, ncluding ST-standard jlass optical, 3NC-coaxial, AES-EBU (XLR) anc TOSLINK. The CD also includes analog outputs for both balanced (XLR) and single-ended (phono plug) connection to your preamp. In short, both CDTI and CD1 are equipped for easy incerporation into any music reproduction system. Anc both include remote control, standard.
So, the choice is yours. Fcr superb performance with any outboard digital-to-analog processor, is s the CDTI compact dise transport. For all-round musicality in a single chassis (with the option of later use aэ a transport), it's the CD1 compact disc player.
Some audio critics have scid that digitally encoded music has finally come of age. We say it's been reborn. Experience it soon at your nearest authorized Audio Research retail specialist.

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# Choosing between the CDT1 transport and the CD1 transport-player. 

## CD1 SPECIFICATIONS

OUTPUTS, ANALOG: (Stereo)

1. Balanced XLR $4.2 V$ RMS ( $\pm 12.5 \mathrm{dBv}$ ) max.
2. Unbalanced RCA 2.1V RMS (+6dBv) max..

OUTPUT IMPEDANCE: (Analog)
350 ohms balanced, 175 ohms unbalanced.
FREQUENCY RESPONSE:
$0.1-20,000 \mathrm{~Hz} \pm 0.2 \mathrm{~dB}$
SIGNAL TO NOISE RATIO: 95dBA
DISTORTION: -80dB ( $0.01 \%$ ) 1kHz
CHANNEL SEPARATION: 94 dB 1 kHz
PHASE LINEARITY: $\pm 0.5^{\circ} 20-20,000 \mathrm{kHz}$

## CD1/CDT1 SPECIFICATIONS

OUTPUTS, DIGITAL:
(to external Digital-to-Analog Converter)

1. XLR Balanced AES/EBU 110 -ohm 4V P-P
2. BNC coax SPDIF 75 -ohm 0.7V P-P.
3. TOSLINK fiber optical -19dBm, 660 nm .
4. ST-type glass fiber optical -12 dBm , $875 \mathrm{~nm}, 62.5 / 125 \mu \mathrm{~m}$ fibers.
SIGNAL FORMAT (disc):
Sampling frequency: 44.1 kHz
Quantization Bit: 16 bit linear per channel.
Channel bit rate: $4.3218 \mathrm{Mb} / \mathrm{sec}$.
Channel modulation code: EFM (8-14 modulation).
Error correction: CIRC (cross interleave Reed Solomon Code.)

DRIVE MECHANISM:
Phillips CDM-12.1 with magnetic disc clamping.
Discs: Accepts $5^{\prime \prime}(12 \mathrm{~cm})$ and $3^{\prime \prime}(8 \mathrm{~cm})$ sizes.
Wow \& Flutter: Unmeasureable (Quartz stability)
OPTICAL PICKUP:
Type: 3-beam LDGU (Laser Diode \& Grating
Unit), with holographic diffraction light pen.
Laser: GaAIAs semiconductor, $780 \mathrm{~nm}, 0.5 \mathrm{~mW}$ max output.
Servo: Digitally-controlled low-inertia linear positioning actuator
DIGITAL MICROPROCESSORS:

1. Servo/Control microprocessor.
2. Signal data microprocessor.

JITTER REDUCTION: High-stabillity crystalcontroiled re-clocking for all outputs

DISPLAY: Six-digit vacuum fluorescent, with optical filter.

TRANSPORT CONTROLS (soft-touch buttons):
OPEN/CLOSE disc drawer
PLAY disc
TRACK change up/down
PAUSE program
STOP disc
TIME elapsed/remaining, track or disc
REPEAT track/disc
SHUFFLE random sequence play
SEARCH med/rapid, forward/back
SCAN ten-seconds each track
POWER main switch
IINFRARED REMOTE CONTROLFUNCTIONS:
(Standard RC5 code, 35ft max distance)
OPEN/CLOSE disc drawer
SELECT track number
SCAN ten-seconds each track
REPEAT track/disc
PAUSE program
STOP program
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DIMENSIONS (standard rack panel): $19^{\prime \prime}(48 \mathrm{~cm})$ W $\times 5^{1 / 4^{\prime \prime}}(13.4 \mathrm{~cm}) \mathrm{H} \times 113 / 4^{\prime \prime}(29.8 \mathrm{~cm})$ D Handles extend $11 / 2^{\prime \prime}(3.8 \mathrm{~cm})$ forward of the front panel. Rear connectors extend $3 / 4^{\prime \prime}(1.9 \mathrm{~cm})$.

WEIGHT: $16 \mathrm{lbs} .(7.3 \mathrm{~kg})$ Net; $26 \mathrm{lbs} .(11.8 \mathrm{~kg})$ Shipping.
Specifications subject to change without notice.

## Two-Year Limited Warranty

The CD1 and CDT1 are backed by a Two-Year Limited Warranty: For one year from date of purchase, Audio Research pays round-trip freight charges on any equipment requiring warranty service at the factory. See your authorized Audio Research dealer for details.
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## CD PLAYERS \& TRANSPORTS



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Fig. 1 Adcom GDA-600, fri (top); de-emphasis err channel dashed, 0.5 dB


Fig. 2 Adcom GDA-600, cre dashed, 10 dB /vertica


Fig. 3 Adcom GDA. 60
IkHz tone at -9 spuriae (\%-octave dashed).


Fig. 4 Adcom GDA-600, de linearity (right chanr $2 \mathrm{~dB} /$ vertical div.).


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digital signal processor

## D/A CONVERTERS



## D/A CONVERTERS




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It's not something you can trust to a sledgehammer on a stick of dynamite. When Sonic Frontiers decided to develop a line of digital products, they realized that to crack the digital code it must be handled delicately - bit by bit. During the initial conceptual design, special cor sideration was given to the areas of re-clocking, digital to-analog conversion, and the analog output stage. The result of these efforts is the SFD-1 and SFD-2 Digital Processors and the UltraJitterbug Digital Interface each sharing a common purpose - the "clean up" of the digital signal. The sonic "payoff" for both music lovers and critics worldwide is readily apparent.

## AE.CLOCKING

All three of Sonic Frontiers' digital products employ the lakest UltraAnalog Input Receivers: the AES20/21. These receiver modules combot the problem of jitter, a time variation in the digitol signal. They reject the oulput jitter from your transpart or other digitol source (from 1 kHz and above) and are also intrinsically low in jitter (less than 40 picoseconds). The SFD- 1, SFD-2 and Ulitralitterbug utilize these remarkable receivers to re-clock the digital signol which is then fed to the D/A converter modules (or in the case of the Ultrajitterbug, to a digital processor) The resulting improvement in sonic performance is outstanding

## DIGITAL-TO-ANALDG CONVERSION

Again, UllraAnalog was chosen for the job. These newly designed dual DACs, the D20400A the first significant improvement made to their modules in 5 years), offer without a doubt, the best sound and performance in digital-to-analog conversion going today. This digital-to-analog technology is traken to the limit in the SFD-2, where two dual DACs are used to attain an actual differentially balanced configuration. The SFD-1, utilizing only one dual D20400A and the same basic technology as the SFD-2, offers superb performance and exceptional value.

## ANALDG DUTPUT ETAGE

The output sections of the SFD-1 and SFD- 2 handle the musical signal with the utmost care. Both of discrete design (no op amps), they share the same circuit topology, with the SFD-1 utilizing more modest components. These two prod ucts both profit by utilizing two extremely musical and very reliable Sovtek 6922 tubes os the tube complement of choice for the output buffer (cathode follower) stage. The outcome is a sound which is free from the familiar digital glare.

## THE PAYOFF

These three elements are bocked up with the exceptional ports quality, unmatched value, and uncompromising craftsmanship for which Sonic Frontiers has become famous. Add to that a full five-year ports and labor warranty and a one-year warranty on the tubes and you have the right combination for a long-term, satisfying relationship. If you would like to learn more about the Sonic Frontiers Ultralitterbug, SFD-1 or SFD-2 Digital Processors, or any other Sonic Frontiers' product, call or write and ask for the product brochures. We'll be happy to answer your questions on code cracking and how this exquisite loot" can be obrained.

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This Month's


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| Lourdspeakers <br> Yamaha NSA-635 <br> 3-Way Speaker System <br> - Acoustic suspension design 88 inch wooler <br> -Ferro-fluid cooled midrange \& dome tweeter <br> - Power rating: 10-140 watts 8 ohm impediance <br>  <br> (nsa635) <br> Pinnacle PN2+ <br> -2-way, 4" wooter <br> Technics SB-LX5 <br> $\ldots$. pair $79^{95}$ <br> *3-way. 10 woofer <br> ${ }^{\text {par }} 5119^{55}$ <br> JBL Pro III <br> High Pertormance mini, 2-way, shelded pair <br> s. $149^{95}$ <br> Recaton W-440 <br> Wireless System, individual controls <br> Pinnacle PN8+/Oak <br> -2-way, $\mathrm{f}^{\prime \prime}$ woofer, dual diaduct ports pair $\mathbf{5 4 9} \mathbf{2 0 5}^{\mathbf{9 5}}$ <br> Bose 301-III <br> - O rect/Refliecting Speakers, 2 -way <br> ${ }^{5} 318^{\circ 0}$ |
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|  | \$9985 |
| -10-bands /channe\|. display analyzer. +/-12d日 |  |
| AudioSource EQ11 <br> - 10 -bandsichannel, AN input duboing swith | \$119 ${ }^{95}$ |
| Technics SH-GE70 <br> -7-bands/channel, 12 preset memories | 95 |
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## D/A CONVERTERS

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline \begin{tabular}{l}
DIGITAL INPUTS/0 \(\mathrm{C}=\) Coaxial (S/P D \\
\(\mathrm{T}=\) Tosink \\
(Plastic Fiber-0 \\
\(A=A T \& T\) Styie \\
(Glass Fiber-Op \\
\(B=\) Balanced (AES
\end{tabular} \& \(\qquad\) \& ॠ \&  \& \&  \&  \&  \&  \&  \&  \&  \&  \&  \& 发 \\
\hline PS AUDIO (Continued) \& Reterence Link LS(RI) \& B \& 20-8x \& 1 \& V/S \& S \& FN/B \& \[
\begin{aligned}
\& 2 C / 1 T / 1 A \\
\& 1 R
\end{aligned}
\] \& 1 C \& \(20-20 \pm 0.3\) \& 98 \& 0.01 \& 4795.00 \& 18-bit A/D conversion. \\
\hline \[
\begin{aligned}
\& \text { RESOLUTION } \\
\& \text { AUDIO }
\end{aligned}
\] \& Quantum Reference 20 Chronos \& \[
\begin{aligned}
\& \mathrm{A} / \mathrm{B} / \mathrm{C} \\
\& \mathrm{~A} B / \mathrm{C} \\
\& \mathrm{~A} B / \mathrm{C}
\end{aligned}
\] \& \[
\begin{aligned}
\& 20-8 x \\
\& 20-8 x
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline 1 \\
1 \\
\hline
\end{array}
\] \& \& \[
\begin{array}{|l|}
\hline B \\
B \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& \hline F / B \\
\& F / B
\end{aligned}
\] \& \[
\begin{aligned}
\& 1 \mathrm{C} / 1 \mathrm{~A} \\
\& 2 \mathrm{C} / 1 \mathrm{~A} \\
\& 1 \mathrm{C} / 1 \mathrm{~T}
\end{aligned}
\] \& 3C/2A \& \[
\begin{aligned}
\& 20-20 \pm 0.5 \\
\& 20-20 \pm 0.5
\end{aligned}
\] \& \[
\begin{aligned}
\& \hline 108 \\
\& 108
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline 0.01 \\
0.01 \\
\hline
\end{array}
\] \& \[
\begin{array}{r}
2995.00 \\
1495.00 \\
795.00
\end{array}
\] \& Signal reclocker and splitter; accepts mono digital input for use with two D/A converters. \\
\hline ROKSAN \& ATT-DA2/DSU \& A/B/C \& 18-68X \& \& S \& No \& F \& 4 C \& None \& \(20-20 \pm 0.3\) \& 105 \& 0.005 \& 2550.00 \& Selectable polarity; optional AT\&T output. \\
\hline RSN DIGITAL \& \[
\begin{aligned}
\& \text { DAC-T } \\
\& \text { DAC-X } \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& \mathrm{A} / \mathrm{B} / \mathrm{C} \\
\& \mathrm{~A} / \mathrm{B} / \mathrm{C}
\end{aligned}
\] \& \[
\begin{aligned}
\& 18-8 X \\
\& 20-8 X \\
\& \hline
\end{aligned}
\] \& 1
1
1 \& \& \& F \& \(1 C\)
10
10 \& \& \[
\begin{aligned}
\& 4-20 \pm 1.0 \\
\& 4-20 \pm \pm 1.5
\end{aligned}
\] \& \[
\begin{aligned}
\& 93 \\
\& 100
\end{aligned}
\] \& \[
\begin{array}{|c|}
\hline 0.09 \\
0.01 \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& 799.00 \\
\& 699.00
\end{aligned}
\] \& Tube hybrid analog stage. \\
\hline SENTEC \& DiȦпa \& A/B/C \& 20-8X \& 1 \& \& \& F \& 20/1T \& \& 0.1-20 +0,-0.1 \& 110 \& 0.01 \& 1150.00 \& Current conveyor circuif; Class A. \\
\hline \[
\begin{aligned}
\& \hline \text { SONIC } \\
\& \text { FRONTIERS }
\end{aligned}
\] \& \begin{tabular}{l}
SFD-1 \\
SFD-2 \\
Ultrajitterbug
\end{tabular} \& \[
\begin{aligned}
\& \mathrm{AB} / \mathrm{B} / \mathrm{C} \\
\& \mathrm{~A} / \mathrm{B} / \mathrm{C} \\
\& \mathrm{~A} / \mathrm{B} / \mathrm{C}
\end{aligned}
\] \& \[
\begin{aligned}
\& 20-8 x \\
\& 20-8 x
\end{aligned}
\] \& 1 \& \& B \& F/B
\(F / B\)
\(B\) \& \[
\begin{aligned}
\& 1 \mathrm{C} / 1 \mathrm{~T} / 1 \mathrm{~A} \\
\& 1 \mathrm{C} / \mathrm{A} 1 \mathrm{~B} \\
\& 1 \mathrm{C} / 1 \mathrm{~T} / 1 \mathrm{~B}
\end{aligned}
\] \& \[
\begin{aligned}
\& 1 \mathrm{C} / \mathrm{C} / \mathrm{B}
\end{aligned}
\] \& \(5-20 \pm 0.5\)
\(5-20 \pm 6.5\) \& \[
\begin{aligned}
\& 110 \\
\& 110 \\
\& 110
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline 0.1 \\
0.1
\end{array}
\] \& \[
\begin{array}{r}
2195.00 \\
4695.00 \\
695.00
\end{array}
\] \& Digital reclocker and jitterreduction device. \\
\hline SOUNDSTREAM TECHNOLOGIES \& DAC-1 \& A/B/C \& \(\dagger\) \& 2 \& S \& No \& F \& 2C/17 \& None \& 5-20 \& 100 \& 0.01 \& 695.00 \& thybrid, 18-bit/1-bit, 8 X . \\
\hline \begin{tabular}{|l|}
\hline SPECTRAL AUDIO \\
\hline
\end{tabular} \& SDR-2000
Reference \& A/B \& 20-8X \& 2 \& \& B/R \& F/B \& \(3 \mathrm{C} / 17 / 28\) \& \& 0-22 \(\pm 0.3\) \& 120 \& 0.002 \& 7495.00 \& External power supply; master clock jack. optional AT\&T input. \\
\hline \begin{tabular}{l} 
STAX \\
\hline SUIM0
\end{tabular} \& \[
\begin{aligned}
\& \text { DAC-Talent } \\
\& \text { DAC-Talent BD } \\
\& \text { DAC-X1t } \\
\& \hline
\end{aligned}
\] \& A/B/C \(A / B / C\) A/B/C \& \[
\begin{aligned}
\& 20-8 x \\
\& 20-8 x \\
\& 20-8 x
\end{aligned}
\] \& \[
\begin{array}{|l}
\hline 1 \\
1 \\
2 \\
\hline
\end{array}
\] \& S \& \[
\begin{array}{|l|l|}
\hline \text { No } \\
B \\
\hline \\
\hline
\end{array}
\] \& \begin{tabular}{l} 
F \\
F \\
F/B \\
\hline F/B
\end{tabular} \& \[
\begin{aligned}
\& 1 \mathrm{CC/1T} \\
\& 2 \mathrm{C} / 1 \mathrm{~A} 1 \mathrm{~B} \\
\& 3 \mathrm{C} / 3 \mathrm{~T}
\end{aligned}
\] \& \& \[
\begin{aligned}
\& 0-20 \pm 9.5 \\
\& 0-20 \pm 0.5 \\
\& 4-20 \pm 0.5 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 118 \\
\& 118 \\
\& 118 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 0.0015 \\
\& 0.0015 \\
\& 0.0016 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 2700.00 \\
\& 4500.00 \\
\& 12.000 . \\
\& \hline
\end{aligned}
\] \& \begin{tabular}{l}
Battery operated. \\
Tube output stage
\end{tabular} \\
\hline SUMO \& Theorem \& A/B/C \& 18-8X \& 1 \& None \& B \& F/B \& 16/1T/18 \& 1 C \& 20-20 \(\pm 0.2\) \& 102 \& 0.005 \& 799.00 \& Master clock sync with Axiom CD transport; optional dual D/A converter and balanced analog output. \\
\hline THETA DIGITAL \& DS-Pro Generation 5 DS-Pro Basic III DS-Pro Prime II DS-Pro Pride Cobalt 307 \& \[
\begin{aligned}
\& A / B / C \\
\& A / B / C \\
\& A / B / C \\
\& A / B / C \\
\& A B / C
\end{aligned}
\] \& \[
\begin{aligned}
\& 20-8 X \\
\& 20-8 X \\
\& 18-4 X \\
\& 18-4 X \\
\& 18-8 X
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline 2 \\
2 \\
2 \\
1 \\
1 \\
1
\end{array}
\] \& \& \[
\begin{aligned}
\& B / R / S \\
\& B / R / S \\
\& B / R / S \\
\& B / R / S
\end{aligned}
\] \& \[
\begin{aligned}
\& F / B \\
\& F / B \\
\& F / B \\
\& F \\
\& F \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 4 \mathrm{C} \\
\& \\
\& 3 \mathrm{C} / 1 \mathrm{~T} / 1 \mathrm{~B} \\
\& 1 \mathrm{C} / 1 \mathrm{~T} \\
\& 1 \mathrm{C} / 1 \mathrm{~T} \\
\& 1 \mathrm{C} / 1 \mathrm{~T}
\end{aligned}
\] \& \[
\begin{aligned}
\& 1 \mathrm{C} \\
\& 1 \mathrm{C} \\
\& 1 \mathrm{C} \\
\& 1 \mathrm{C} \\
\& 1 \mathrm{C} \\
\& 10
\end{aligned}
\] \& \[
\begin{aligned}
\& 1-20 \\
\& 1-20 \\
\& 1-20 \\
\& 1-20 \\
\& 1-20
\end{aligned}
\] \& \[
\begin{aligned}
\& 108 \\
\& 108 \\
\& 108 \\
\& 108 \\
\& 108
\end{aligned}
\] \& \[
\begin{aligned}
\& \hline 0.002 \\
\& \\
\& 0.002 \\
\& 0.008 \\
\& 0.008 \\
\& 0.008
\end{aligned}
\] \& \[
\begin{array}{r}
5595.00 \\
\\
2495.00 \\
1499.00 \\
95.00 \\
595.00 \\
\hline
\end{array}
\] \& Optional Toslink, AT\&T, AES/EBU, and proprietary optical inputs. Optional AT\&T and proprietary optical inputs. As above As above. \\
\hline \[
\begin{aligned}
\& \text { TIMBRE } \\
\& \text { TECHNOLOGY }
\end{aligned}
\] \& T-1 \& A/B/C \& 1-256X \& 1 \& S \& B/S \& F \& 2C/1T/1A \& None \& 20-20 \(\pm 0.1\) \& 96 \& 0.005 \& 3295.00 \& Selectable polarity, with balanced analog output and different digital inputs (one coaxial, one Toslink, one AT\&T, and one AES/ EBU), \$3895.00; options as upgrade, \(\$ 850.00\) \\
\hline VAC \& \begin{tabular}{l}
DAC MkII \\
DAC II Mkil
\end{tabular} \& \begin{tabular}{l}
\(\mathrm{AB} / \mathrm{C}\) \\
A/B/C
\end{tabular} \& \[
\begin{aligned}
\& 1-512 \mathrm{X} \\
\& 1-512 \mathrm{X}
\end{aligned}
\] \& 2 \& S \& B \& F/B \& 2C/1A
20 \& 10 \& \(4-20+0.0 .5\)
\(4-20+0 .-0.5\) \& 96

96 \& 0.04
0.1 \& 4490.00 \& Externa! power supply; Class A; tube analog stage; no negative feedback; selectable polarity; optional AES/ EBU inputs and output. As above but internal power supply; optional AT\&T input and balanced analog output. <br>

\hline VIMAK \& | DS-1800 |
| :--- |
| DS-1800 MKII(RI) |
| DS-500 | \& A/B \& \[

18.64 \mathrm{X}
\]

\[
18-64 X

\] \& 1 \& | S |
| :--- |
| S | \& | $\mathrm{B} / \mathrm{R} / \mathrm{S}$ |
| :--- |
| $B / R / S$ | \& | $\overline{F / B}$ |
| :--- |
| F/B | \&  \& | 1C/1T |
| :--- |
| $1 T$ or 1 A |
| and $\ddagger B$ | \& $5-20+0.1,-0.5$

$5-20+0.1,-0.5$
$5-20+0.2,-0.5$ \& 102
102
100 \& 0.004
0.003
0.002 \& 3300.00

4350.00
1350.00 \& Delta Sigma D/A conversion; accepts up to 24-bit data; applies dither; optional AT\& T input and buffered coaxial digital output; RS232/485 port. Conversion, data acceptance, and dither as above. 18-bit AD converter, external power supply; balanced and unbalanced analog inputs. <br>

\hline VTL \& TDAC-1A TDAC-5 \& $\mathrm{A} / \mathrm{B} / \mathrm{C}$ A/B/C \& \[
$$
\begin{aligned}
& 20-256 x \\
& 20-256 x
\end{aligned}
$$

\] \& 1 \& V/S \& \[

$$
\begin{aligned}
& R \\
& R
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \text { V } \\
& \text { FN/B }
\end{aligned}
$$

\] \& C/T C/T/AB \& \[

$$
\begin{aligned}
& \mathrm{C} \\
& \mathrm{C} / 8
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 15-20 \pm 1 \\
& 10-20 \pm 0.2
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 97 \\
& 100
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.01 \\
& 0.008
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 2490.00 \\
& 4995.00
\end{aligned}
$$
\] \& Tube analog stage. As above; stepped attenuator. <br>

\hline WADIA DIGITAL \& | Wadia 9(RI) |
| :--- |
| Wadia 25(RI) |
| Wadia 15(RI) |
| Wadia 12 |
| Wadia 17 | \& | A/B/C |
| :--- |
| A/B/C |
| A/B/C |
| A/B/C |
| A/B | \& \[

$$
\begin{array}{|l|}
\hline 24-64 X \\
24-32 X \\
18-32 X \\
18-16 X
\end{array}
$$

\] \& 2 \& \[

$$
\begin{array}{|l|}
\hline v / S \\
v / S \\
v / S \\
s \\
s
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& \hline B / R / S \\
& B / R / S \\
& B / R / S \\
& B / R / S \\
& B / R / S
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& V / B \\
& V / B \\
& V / B \\
& F / B
\end{aligned}
$$
\] \& $3 A$

$2 C / 1 T / 2 A$
$1 B$
$2 C / 1 T / 2 A$
$1 B$
$1 C / 1 T / 1 A$

$1 B$ \& 1C/1T/3A 1B \& 20-20 $\pm 0.005$ \& 107 \& \& \[
$$
\begin{aligned}
& 13,500 \\
& \\
& 4750.00 \\
& 4000.00 \\
& 1500.00 \\
& 3250.00
\end{aligned}
$$

\] \& | Software based; digital volume control; external power supply. Sottware based; digital volume control. As above. |
| :--- |
| AD converter; four analog inputs. $\dagger 1$-bit, 64 X resampled. | <br>

\hline WOODSIDE/ RADFORD \& $$
\begin{aligned}
& \text { DVAC-18 Tube } \\
& \text { DAC } 1 \\
& \text { DAC } 2
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& \begin{array}{l}
A B / C \\
A \prime B \\
B
\end{array}
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 18-64 X \\
& 16-4 X \\
& 16-4 X
\end{aligned}
$$
\] \& 1

1
1

1 \& $$
\begin{array}{|l|}
\hline \mathrm{S} \\
\mathrm{~S}
\end{array}
$$ \& \[

$$
\begin{aligned}
& \hline \mathrm{B} \\
& \mathrm{No} \\
& \mathrm{No} \\
& \hline
\end{aligned}
$$
\] \& F \& 4C

$2 \mathrm{C} / 1 \mathrm{~T}$

1 C \& $$
\begin{aligned}
& 1 \mathrm{C} \\
& 1 \mathrm{C}
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& 10-20 \pm 0.1 \\
& 10-20+0.1 \\
& 10-20 \pm 0.1
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l}
\hline 110 \\
110 \\
110 \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 0.002 \\
& 0.001 \\
& 0.001
\end{aligned}
$$

\] \& \[

$$
\begin{array}{r}
1995.00 \\
1595.00 \\
895.00
\end{array}
$$
\] \& Tube analog stage. Selectable polarity. <br>

\hline
\end{tabular}



## AMPLIFIERS




## aragon palladium. the balance of power



Palladium monoblocks go beyond the typical high-end amplifier with balanced inputs. Palladium's unique discrete dual difiterential circuit is balanced from irput to output. Now your balanced preamplifier will provide balanced Class A operation all the way to the loudspeakers. Aragon's world renowned value is again very evident. You cannot acquire Palladium's quality for under $\$ 15,000$, yet the pair are only $\$ 4,000$. With this unique balanced power amplifier the balance of power shifts to Aragon.

MONDIAL DESIGNS LIMITED 2 Elm St. Ardsley, New York 10502 • 914-693-8003

## acurus

 Accuracy from the U.S.

## AMPLIFIERS



## 10 details

## to look for

## in your next




## 1. Enough power to rock a city block.

Great sound takes a lot of power. That's why Adcom's GFA-5800 power amplifier is built around an enormous toroidal transformer. The kind that makes most high-end stereo buffs listen and take notice. It has the highest power-to-weight/ space ratio of any transformer design on the market. And because it is designed with totally separate secondary windings and independent ground connections, each channel is completely isolated from crosstalk and AC line interference. Clear, powerful sound. The kind your neighbors love to hear.

## 2. Front end power. I andidion othe CFA.s.smo sman

 toroidal transformer, two separate "front end" transformers are also used. These additional devices isolate the front end input stages from the main output section. And by using two transformers, one for the left channel and one for the right channel, any peak demands from the output stages will not decrease the operating voltages for the input sections. This design also contributes to ideal separation at the inputs for better soundstaging and more precise imaging.

3. Huge power supplies. Adcom's GFA-5800 power amplifier does something that most amps only dream of. It has exceptionally large capacitors, (over 100,000 microfarads of total filter capacitance), that are able to store large amounts of DC current for supply to the speakers. This large storage capacity means that the amp won't be starved for power when you're driving low impedance speaker systems. Now your speakers and your music sound the way you expect them to, all the time.
 is a testament to simplicity of organization and outstanding sound. Using single-ended Class "A" circuitry in the front end, Adcom's GFA-5800 delivers the pure sound that other amplifiers only talk about. And because the gain devices are biased by constant current sources, they won't change their bias under changing temperature or dynamic conditions. All devices are precision matched for flawless performance and negligible distortion, producing a high damping factor and higher output currents.


## 5. Transistors that sound like tubes. Allansisosin ite

signal path of the Adcom GFA-5800 are $100 \%$ Intemational Rectifier Hexfets. Hexfet circuits are reference grade, hybrid MOSFET transistors. These innovative circuits surpass conventional MOSFET technology, providing superior performance, consistency and reliability. Hexfet circuitry produces all the punch and muscle of bipolar devices with the sweeter sound of tube amps. The use of Hexfet circuits creates an efficient board with direct gain paths. The GFA- 5800 only has three gain stages while comparable amps can have five stages or more. The shorter the path of power resistance, the better the sound.

## 6. Cool running heat sinks. Nadiga areferue

 class amplifier that delivers superior sound under all conditions is one thing. Making sure it runs cool enough so it won't overheat is another. With Adcom's GFA-5800 you get both. Because of it's oversized toroidal transformer, front end transformers and MOSFET circuits it requires an active cooling system to dissipate the heat that all superior power amplifiers create. By combining a state-of-the-art heat sink design with a microsized cooling fan, the GFA-5800 can blow air through a tunnel in the heat sink and dissipate up to 1500 watts on a continuous basis. This way your hottest tunes can stay cool.

## 

 easy speaker hook-ups. Accepting either standard stripped or "tinned" wires, single or dual banana plugs or spade lug connectors, the GFA-5800 is a great match for any system. And since it can drive virtually any speaker system, regardless of its impedance, even the most demanding speakers will sing beautiful music. Additionally, the GFA-5800 also comes equipped with two sets of binding posts for each channel. These extra binding posts allow the GFA-5800 to accommodate speaker systems that have "bi-wire" capabilities for extra output compatability.

## 8. Great sound from the outside in. Adom menes sur thent des sond created

 by your other components is flawlessly transferred to the GFA-5800's balanced power and optimum circuit technology. The GFA-5800 is equipped with two types of input connectors for complete compatability, "Tiffany style", gold-plated RCA jacks and XLR jacks. The GFA-5800's professional grade three pin XLR jacks provide both positive, negative and shield properties. The result is a balanced line connection between the GFA5800 and your other components. This connection is almost immune to electromagnetic and radio frequency interferences and provides a great reduction in "common mode noise".
## 9. More quality than you bargained for.

Dollar-for-dollar the Adcom GFA-5800 out-performs any power amplifier on the market. Its dependable technology and efficient use of the highest quality parts makes it one of the most sought after audiophile products in recent years. And because it's an Adcom component it will benefit from a high resale value and an outstanding dealer service network. After you hear the GFA-5800 you'll agree that it's an incredible value in high end audio.


## 10. Make sure it's an Adcom.

The most important detail to look for before you buy your next amplifier is the Adcom name. Adcom audio components are designed to be second to none. It's this driving passion for accurate, musical sound and performance that has made Adcom components sought after by the discriminating audiophile. Through its combination of technology and innovative engineering techniques, the Adcom GFA-5800 is quite possibly, the best amplifier you may ever hear. From its toroidal transformer and giant capacitors to its revolutionary heat sink assembly and reference grade Hexfet circuitry, the Adcom GFA- 5800 was built to be the best amplifier money can buy. Listen to all the details the GFA- 5800 has to offer at your Adcom dealer today. We're sure you'll agree that the GFA-5800 is truly a sound investment.


## AMPLIFIERS



## AMPLIFIERS



# INTRODUCING BREAKTHROUGH AMPLIFIER TECHNOLOGY WHICH ACHIEVES VIRTUALLY NOTHING. 

The consummate audio amplifier provides pure gain. Nothing else. Nothing added to, nothing subtracted from, the delicate texture of music.
Now a new amplifier from Carver Research achieves "nothing" to a degree never before possible. It's called Lightstar, and when you audition it, you will not hear it. You will hear nothing but transparent, effortless reproduction of music precisely as presented by the source.

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

1. High Voltage Power Supply Storage with five to ten times the usable energy reserves of most comparable amplifiers. Lightstar delivers full rated power below 10 Hz , with perfect doubling of power as impedance is halved for unprecedented low frequency control regardless of speaker impedance fluctuations.
2. A Digital Transformer ${ }^{\text {TM }}$ which optimizes voltages delivered to the output devices. Relieved of "fighting" its own power supply, Lightstar converts voltage to output current with maximum efficiency.

## 3. High Current, Reactive Load-Independent Amplifier with

 over 150 amperes of peak current capability. Revolutionary circuit topology allows reactive currents "kicked back" from loudspeakers to circulate freely without inducing stress, enabling Lightstar to track input signals undisturbed by the vagaries of loudspeaker behavior.The combined result is effortless, uncolored music reproduction. The sound of nothing. Call (206)775-1202 to find out where you can audition Lightstar. If you'd like more technical details, ask for our free White Paper.

## AMPLIFIERS



## RロTE년

- Rotel is not a typical audio company. Unlike the corporate giants of the audio industry, Rotel is a family owned business. We don't make video recorders, bread makers, or electric pianos. Instead, we have spent the last thirty years building high fidelity components that meet two rigorous criteria — musical accuracy and honest value. While we benefit from low-cost production in our own Asian facilities, our design work remains in our R\&D facilities in Britain, where an audiophile pursuit of perfection is a passion.
- Rotel engineers are, first and foremost, music lovers who labor over their new designs like proud parents. They listen to the results, then tweak and adjust until the new product meets exacting musical standards.All Rotel products are truly built from the inside out using premium parts. Components are hand selected for their sound quality and built by industry leading suppliers around the world.


RB990BX 200 watt/channel amplifier


RB980BX 120 watt/channel amplifier


RC990BX remote control preamplifier


RCD965LE compact disc player

## ROTEL OFAMERICA

P. O.BOX PHONE: 800-370-3741 © FAX:508-664-41C9 AFFORDABLE Hen


## Making music memorable.

Be assured: Tae LS5 Mark II stereo line-level preamplifier from Audio Research is no mere nostalgic nod to the past. Rather,it represents a sign f:cant advance in the technology of vacuumtabe amplification as applied to the retrieval ard transmission of meaningful musical information from any input source, analog or digital. The difference is one you will hear immediately in your music system-and neve: forget.
Tie technology making this all pcssible includes a sophisticated, fully regulated pcwer supply using Fatented Decoupled Electrolytic Cafacitor circuits: fully balanced. cross-couplec. all-vacuum-tube amplifization stazes: and
switch-selectable gain allowing a wider range of useful volume contrcl settings with different input sources. All this, plus the harmonic richness and timbral magic of dual-triode vacuum tubes. From the manufacturer with 25 years of experience in bringing recorded music to life.

IE ever there has been a preamplifier tinat will markedly-even astoundinglyimprove :he performance of any dese-ving audio system, the LS5 Mark II is it. You'll hear your favorite music as though illuminated from within, playec specially for you. Intimate. Profound. Lasting. The way music was meant to be experienced, and remembered.


Enter No. 14 on Feader Service Card

## The VT150 Special Edition.



## ". . I felt I was hearing the music itself."

"This Audio Research is unquestionably the best yet...

It had the classic Audio Research 'High Definition' sound, highly revealing and satisfyingly detailed, all this seemingly achieved without effort...

This is a reference-grade result, and is strengthened by the very fine balance of all the sonic aspects which together determine a musically satisfying performance...

It set a new standard for amplifiers combining the purity and grace of the vacuum tube with the precision and
constancy of the solid state.
The VT 150 is a tour de force for William Z. Johnson..."
By Martin Colloms
Reprinted from
HI-FI NEWS \& RECORD REVIEW February 1994
"The VT 150s presented an astonishingly believable and natural rendering of timbre. Instead of hearing a hi-fi representation of the music, I felt I was hearing the music itself..

The VT 150 is, without question, the best power amplifier I've heard... The VT 150s went far beyond any descriptions of sonic qualities. Instead, they were truly
transcendental, bringing me so much closer to my favorite music than I thought could be achieved by changing power amplifiers...

The bottom line is that I've enjoyed music more through the LS5 and VT 150s than with any other electronics I've had in my system. In fact. nothing else has ever come close. The VT 150 s provided the kind of experience that must be experienced firsthand to be believed."
By Robert Hartley
Reprinted from
STEREOPHILE
Vol.17, No. 18, August 1994

## audio research <br> H I G H DEFINIT I O N®

## AMPLIFIERS




## CONRAD-JOHNSON PF2 AND MF2300 Solid-State Componens Without Solid-State Sound

Too often, solici-state audio components sound harsh, edgy, grainy, and dimensionless. This is sicommon amone selidstate designs that audiophiles readily dentify this unmusical sonic signeare as "transistor sound". At conrad-jonnson, we have long believed that these aud ble distortions are not inherent irs solid-ssate devices. Instead, thew are a conseq rence of circuir design and implementation. Through innovative circuit design and the use of highost guality parts. we heve developed a range of conrad-jathnson solid-state produats that prove the peint. They do not sound 1 ke solid-state They just sound like music

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline ManuFacturer \&  \&  \&  \&  \&  \&  \&  \&  \&  \&  \& \begin{tabular}{l}
PO \\
s
\end{tabular} \& WER \& \[
\begin{aligned}
\& \text { AMP } \\
\& / / \\
\& 8 \\
\& 8 \\
\& 8 \\
\& 8 \\
\& 8
\end{aligned}
\] \&  \& 5 \& 家 \&  \&  \& \& \[
s_{120}
\] \\
\hline MUSE (Continued) \& \[
\begin{aligned}
\& 175 \\
\& 300
\end{aligned}
\] \& \[
\begin{aligned}
\& \mathrm{B} / \mathrm{M} \\
\& \mathrm{~B} / \mathrm{M}
\end{aligned}
\] \& \[
\begin{aligned}
\& 0.5 \\
\& 0.5
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { Yes } \\
\& \text { Yes }
\end{aligned}
\] \& \[
\begin{aligned}
\& 105 \\
\& 115
\end{aligned}
\] \& \[
\begin{aligned}
\& 1.1 \mathrm{~V} \\
\& 1.6 \mathrm{~V}
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \[
\begin{aligned}
\& 175 \\
\& 300
\end{aligned}
\] \& \[
\begin{aligned}
\& 325 \\
\& 500
\end{aligned}
\] \& \begin{tabular}{l}
13-250 \\
13-250
\end{tabular} \& \[
\begin{aligned}
\& \mathrm{AB} \\
\& \mathrm{AB}
\end{aligned}
\] \& \& \[
\begin{aligned}
\& 51 \\
\& 51
\end{aligned}
\] \& \& \& \& \[
\begin{aligned}
\& 38 \\
\& 40
\end{aligned}
\] \& \[
\begin{array}{|r|}
3250.00 \\
\text { Pair } \\
3500.00 \\
\text { Pair }
\end{array}
\] \& \& \\
\hline MUSEATEX AUDIO \& \[
\begin{aligned}
\& \hline \text { AS10 } \\
\& \text { AM15 }
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline B \\
B / M
\end{array}
\] \& \[
\begin{aligned}
\& 0.25 \\
\& 0.25
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline \text { No } \\
\text { No }
\end{array}
\] \& \[
\begin{array}{|l|}
\hline 200 \\
200
\end{array}
\] \& \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline 100 \\
150 \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& \hline 150 \\
\& 250
\end{aligned}
\] \& \[
\begin{aligned}
\& 1-20 \\
\& 1-20
\end{aligned}
\] \& \[
\begin{aligned}
\& \hline \mathrm{AB} \\
\& \mathrm{AB}
\end{aligned}
\] \& \& \[
\begin{aligned}
\& 100 \\
\& 100
\end{aligned}
\] \& \% \& 3 \& \& \[
\begin{aligned}
\& 24 \\
\& 24
\end{aligned}
\] \& \[
\begin{array}{r}
1999.00 \\
1799.00 \\
\text { Each }
\end{array}
\] \& \& loating charge power supply. s above. \\
\hline MUSICAL DESIGN \& \[
\begin{array}{|l}
\hline D-75 \\
\text { DM-100 } \\
D-150 \\
\hline
\end{array}
\] \& \[
\begin{array}{|l|}
\hline B \\
B \\
\hline
\end{array}
\] \& \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \[
\begin{aligned}
\& 30 \\
\& 30 \\
\& 30 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 1.7 \mathrm{~V} \\
\& 1.7 \mathrm{~V}
\end{aligned}
\] \& \begin{tabular}{l} 
No \\
No \\
No \\
\hline
\end{tabular} \& \[
\begin{array}{|l|}
\hline 75 \\
100 \\
150 \\
\hline
\end{array}
\] \& \[
\begin{array}{|l|}
\hline 125 \\
200 \\
240 \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& \hline 0.3-200 \\
\& 0.3-200 \\
\& 0.1-180 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& \hline A B \\
\& A B \\
\& A B \\
\& \hline
\end{aligned}
\] \& \& \[
\begin{array}{r}
24 \\
24 \\
24 \\
\hline
\end{array}
\] \& \& \[
W^{2}
\] \& \& \[
\begin{array}{|l|}
\hline 20 \\
28 \\
35 \\
\hline
\end{array}
\] \& \[
\begin{array}{r}
795.00 \\
1095.00 \\
1495.00 \\
\hline
\end{array}
\] \& \& ridgeable. s above. \\
\hline \[
\begin{aligned}
\& \text { MUSIC } \\
\& \text { REFERENGE }
\end{aligned}
\] \& RM-9 MKII
RM-10 \& \[
\begin{aligned}
\& \mathrm{B} / \mathrm{T} \\
\& \mathrm{~B} / \mathrm{T}
\end{aligned}
\] \& \[
\begin{aligned}
\& 0.2 \\
\& 0.3
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \& \& No
No \& \[
\begin{aligned}
\& 125 \\
\& 35
\end{aligned}
\] \& \[
\begin{aligned}
\& 125 \\
\& 35
\end{aligned}
\] \& \[
\begin{aligned}
\& 20-20 \\
\& 20-20
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline \text { A/AB1 } \\
\text { A/AB1 }
\end{array}
\] \& 1.5 \& \[
\begin{aligned}
\& 100 \\
\& 100
\end{aligned}
\] \& \& \& \& \[
\begin{aligned}
\& 59 \\
\& 16
\end{aligned}
\] \& \[
\begin{array}{r}
2950.00 \\
772.00
\end{array}
\] \& \& trappable; adjustable gain. ptional adjustable gain and eadphone jack; mono version vailable. \\
\hline MUSIC \& SOUND \& \[
\begin{aligned}
\& \text { SPA-100 } \\
\& \text { SPA-65 }
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline B \\
B \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& 0.1 \\
\& 0.1 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { Yes } \\
\& \text { No }
\end{aligned}
\] \& \[
\begin{aligned}
\& 30 \\
\& 30
\end{aligned}
\] \& \& No
No \& \[
\begin{aligned}
\& 100 \\
\& 65 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 200 \\
\& 130
\end{aligned}
\] \& \(10-100\) 10-100 \& \[
\begin{aligned}
\& \mathrm{AB} \\
\& \mathrm{AB} \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 3 \\
\& 3
\end{aligned}
\] \& \[
\begin{array}{|l}
20 \\
20 \\
\hline
\end{array}
\] \& \& \& E \& \& \begin{tabular}{l}
849.00 \\
595.00
\end{tabular} \& \& ptional plug-in electronic rossover. \\
\hline NAD \& 214
216 THX
208 THX
\(2100 X X\)
2400 THX
2700 THX
902
906
302
304 \& \[
\begin{array}{|l|}
\hline B \\
B \\
B \\
B \\
B \\
B \\
B \\
B \\
1 \\
\hline
\end{array}
\] \& 0.1
0.03
0.03
0.03
0.03
0.03
0.05
0.05
0.03
0.03 \& \begin{tabular}{l}
No \\
Yes \\
No \\
No \\
No \\
No
\end{tabular} \& \[
\begin{aligned}
\& 60 \\
\& 35 \\
\& 30 \\
\& \\
\& 20 \\
\& 20 \\
\& 20
\end{aligned}
\] \& 100
100
Var.
Var.
100
180
180
165
165 \& No
No
No
No
No
No
No
No
No
No \& 80
150
250
60
100
150
30
30
25
35 \& \[
\begin{aligned}
\& 120 \\
\& 250
\end{aligned}
\] \& \[
\begin{aligned}
\& \hline 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20
\end{aligned}
\] \& \[
\begin{aligned}
\& \hline A B \\
\& A B \\
\& A B \\
\& A B \\
\& A B \\
\& A B \\
\& A B \\
\& A B
\end{aligned}
\] \& 1.8
4
4
5.3
5.7
4.3
2
2
3
3
5.5 \& 60
40
20
20
20
10
10
20
20 \&  \& \[
\begin{array}{|l|}
2.7 \\
2.5
\end{array}
\] \& \[
\begin{array}{|c}
\hline \text { a } \\
\\
\text { No } \\
\text { No } \\
\text { No }
\end{array}
\] \& \[
\begin{aligned}
\& 25 \\
\& 21 \\
\& 22 \\
\& \\
\& 13 \\
\& 14
\end{aligned}
\] \& 449.00
649.00
149.00
429.00
649.00
829.00
279.00
699.00
269.00
379.00 \& \& \begin{tabular}{l}
ridges to 240 watts into 8 ohms. \\
HX certified. \\
s above; bridgeable. \\
Bridgeable. \\
s above: THX certified. \\
As above. \\
ridgeable. \\
s above; six-channel operation.
\end{tabular} \\
\hline NAIM AUDIO \& NAIT 3
NAP \(90 / 3\)
NAP 140
NAP 180
NAP 250
NAP 135 \& 1
\(B\)
\(B\)
\(B\)
\(B\)
\(B / M\) \& 0.01
0.01
0.01
0.01
0.01
0.01 \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No } \\
\& \\
\& \text { No } \\
\& \text { No } \\
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \& \[
\begin{aligned}
\& \hline 75 \\
\& 700 \\
\& 700 \\
\& 900 \\
\& 900 \\
\& 900
\end{aligned}
\] \& No
No
No
No
No
No \& \[
\begin{aligned}
\& 30 \\
\& 30 \\
\& \\
\& 45 \\
\& 60 \\
\& 70 \\
\& 75
\end{aligned}
\] \& \[
\begin{aligned}
\& \hline 45 \\
\& 45 \\
\& 70 \\
\& 90 \\
\& 90 \\
\& 125 \\
\& 135
\end{aligned}
\] \& \[
\begin{aligned}
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline B \\
B \\
B \\
B \\
B \\
B
\end{array}
\] \& \& 22
22
22
22
22
22 \&  \& \& † \({ }_{\text {\% }}^{*}\) \& 10
12
14
26
30
33 \& 1055.00
845.00
1345.00
1895.00
2995.00
2995.00
Each \& \& Optional MM or MC phono stage. 155.00 (MM sensitivity, 2.5 mV ). ncludes \(24-V\) power supply for Naim preamps. s above. s above. Regulated power supplies. As above. \\
\hline NAKAMICHI \& \[
\begin{array}{|l|}
\hline \text { PA-7AlI } \\
\text { PA-5AlI } \\
\hline
\end{array}
\] \& \[
\begin{array}{|l}
\hline B \\
B \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& 0.05 \\
\& 0.05
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \& \[
\begin{aligned}
\& \hline 140 \\
\& 140
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \[
\begin{aligned}
\& 225 \\
\& 150
\end{aligned}
\] \& \& \[
\begin{aligned}
\& 5-50 \\
\& 5-50
\end{aligned}
\] \& Stasis Stasis \& \[
\begin{aligned}
\& 1.7 \\
\& 1.7
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline 50 \\
50
\end{array}
\] \& \& \& \& \[
\begin{aligned}
\& 63 \\
\& 47
\end{aligned}
\] \& \[
\begin{aligned}
\& 2500.00 \\
\& 1750.00
\end{aligned}
\] \& \& \\
\hline NEt \& 800X \& B/H \& 0.08 \& Yes \& 30 \& 590 \& No \& 182 \& 275 \& 20-20 \& B \& 2 \& 20 \& \% \& \& \& 19 \& 459.00 \& \& ridges to 625 watts into 8 ohms; lipping indicators; protection ircuitry. \\
\hline \[
\begin{aligned}
\& \hline \text { NESTOROVIC } \\
\& \text { LABORATORIES } \\
\& \hline
\end{aligned}
\] \& NA-1 \& B/T/M \& 0.5 \& Yes \& \& 1 V \& Var. \& 150 \& 150 \& 18-25 \& \(A B\) \& \& 200 \& \& W \& \& 65 \& \[
\begin{array}{r}
3600.00 \\
\text { Each } \\
\hline
\end{array}
\] \& \& \\
\hline N.E.W. \& \[
\begin{array}{|l|}
\hline \text { A-20 } \\
\text { A-20.1 } \\
\text { A-60 } \\
\hline
\end{array}
\] \& \[
\begin{array}{|l|}
\hline B \\
B \\
B \\
\hline
\end{array}
\] \& 0.002 \& \[
\begin{aligned}
\& \text { No } \\
\& \text { Yes }
\end{aligned}
\] \& \[
\begin{aligned}
\& 50 \\
\& 52 \\
\& 55
\end{aligned}
\] \& \[
\begin{aligned}
\& 140 \\
\& 290 \\
\& 290 \\
\& \hline
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline \text { No } \\
\text { No } \\
\text { No } \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& 20 \\
\& 60 \\
\& \hline
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline 40 \\
120 \\
\hline
\end{array}
\] \& \[
\begin{array}{|l|}
\hline 20-20 \\
20-20 \\
20-20 \\
\hline
\end{array}
\] \& \[
\begin{array}{|l}
A \\
A \\
A \\
\hline
\end{array}
\] \& \& 23 \& \& \& \& 25 \&  \& \& ridges to 85 watts into 8 ohms. ridgeable. As above. \\
\hline NHT \& MA-1A \& \(B / M\) \& 0.1 \& No \& 12 \& Var. \& No \& 80 \& 120 \& 20-20 \& AB \& 2 \& 50 \& \& z \& \& 11 \& \[
\begin{array}{r}
325.00 \\
\text { Each }
\end{array}
\] \& \& ine- and speaker-level inputs; satellite throughputs from peaker-level inputs; adjustable rossover frequency; volume control. \\
\hline NLLES AUDIO \& TVA-20 \& B \& 0.05 \& No \& \& 80 \& No \& 20 \& 25 \& 20-20 \& AB \& 1.5 \& 50 \& \& \& \& 6 \& \& \& Auto on; auto local/main source witching. \\
\hline \begin{tabular}{l} 
NOBIS \\
TECHNOLOGIES \\
\hline
\end{tabular} \& Cantabile Convigore \& \[
\begin{aligned}
\& \mathrm{B} / \mathrm{H} \\
\& \mathrm{~B} / \mathrm{H}
\end{aligned}
\] \& \[
\begin{aligned}
\& 0.5 \\
\& 0.5
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \& \& \[
\begin{aligned}
\& \hline \text { No } \\
\& \text { No }
\end{aligned}
\] \& \[
\begin{aligned}
\& 35 \\
\& 50
\end{aligned}
\] \& \[
\begin{aligned}
\& 35 \\
\& 50
\end{aligned}
\] \& \[
\begin{aligned}
\& 30-21 \\
\& 30-21
\end{aligned}
\] \& \[
\begin{aligned}
\& \mathrm{A} \\
\& \mathrm{~A}
\end{aligned}
\] \& \[
\begin{aligned}
\& 1.2 \\
\& 1.2
\end{aligned}
\] \& \[
\begin{aligned}
\& \hline 100 \\
\& 100
\end{aligned}
\] \& \& \& \& \[
\begin{aligned}
\& 39 \\
\& 43
\end{aligned}
\] \& \[
\begin{aligned}
\& 1695.00 \\
\& 2395.00
\end{aligned}
\] \& \& trappable; adjustable bias. As above. \\
\hline \[
\begin{aligned}
\& \hline \text { OCM } \\
\& \text { TECHNOLOGY }
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { OCM } 500 \\
\& \text { OCM } 200 \\
\& \hline
\end{aligned}
\] \& \[
\begin{array}{|l}
\hline B \\
B \\
\hline
\end{array}
\] \& \[
\begin{array}{|l}
\hline 0.25 \\
0.25 \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& \text { Yes } \\
\& \text { Yes }
\end{aligned}
\] \& \[
\begin{aligned}
\& 200 \\
\& 200 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& \hline 1.1 \mathrm{~V} \\
\& 790
\end{aligned}
\] \& \[
\begin{aligned}
\& \hline \text { No } \\
\& \text { No }
\end{aligned}
\] \& \[
\begin{aligned}
\& 200 \\
\& 100
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline 400 \\
200 \\
\hline
\end{array}
\] \& \[
\begin{array}{|l|}
\hline 0.2-100 \\
0.2-100 \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& \mathrm{AB} \\
\& \mathrm{AB}
\end{aligned}
\] \& \[
\begin{array}{|l}
\hline 3 \\
3 \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& 50 \\
\& 50
\end{aligned}
\] \& \& \& \& \[
\begin{aligned}
\& 66 \\
\& 39
\end{aligned}
\] \& \[
\begin{aligned}
\& 2695.00 \\
\& 1795.00
\end{aligned}
\] \& \& Optional dual outputs. As above. \\
\hline OEM SYSTEMS \& KHS300 \& I \& 0.5 \& Yes \& 10 \& \(\dagger\) \& No \& 25 \& 37.5 \& 20-20 \& \& 2 \& 10 \& \& \& \& 30 \& 1695.00 \& \& our-zone amp; includes four n-wall controllers with individual volume, balance, treble, bass, and ower controls and infrared emote repeater. \(\dagger-20 \mathrm{dBV}\). \\
\hline ONIX \& \begin{tabular}{l}
0A30 \\
OA21S \\
OA31L \\
OA401 \\
0 O601 \\
OA801
\end{tabular} \& \[
\begin{array}{|l}
\hline 1 \\
1 \\
1 \\
B \\
B \\
B / M
\end{array}
\] \& \[
\begin{aligned}
\& 0.02 \\
\& 0.01 \\
\& 0.01 \\
\& 0.01 \\
\& 0.01 \\
\& 0.01
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No } \\
\& \text { No } \\
\& \text { No } \\
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \& 250
250
250
275
275
275 \& No
No
No
No
No
No \& 40
50
60
50
70
100 \&  \& \(20-20\)
\(20-20\)
\(20-20\)
\(20-20\)
\(20-20\)
\(20-20\) \& \begin{tabular}{l}
\(A B\) \\
\(A B\) \\
\(A B\) \\
\(A B\)
\end{tabular} \& \& \[
\begin{aligned}
\& 22 \\
\& 22 \\
\& 22
\end{aligned}
\] \& \& \& \& \[
\begin{aligned}
\& 13 \\
\& 15 \\
\& 14 \\
\& 9 \\
\& 9 \\
\& 16 \\
\& 16
\end{aligned}
\] \& \[
\begin{array}{|r|}
\hline 595.00 \\
795.00 \\
\\
995.00 \\
\\
795.00 \\
1495.00 \\
1750.00 \\
\text { Each } \\
\hline
\end{array}
\] \& \& \begin{tabular}{l}
Headphone jack. \\
Optional MM or MC phono stage, 125.00; optional external power upply, S.O.A.P. 2, \$650.00. \\
Phono stage as above; headphone ack; with tone controls, OA31LT, 1095.00. \\
internal power supply for OA24 preama. \\
Separate power supply for each channel.
\end{tabular} \\
\hline \begin{tabular}{|c|}
\hline ONKYO \\
\\
\\
(Continued)
\end{tabular} \& M-501
Integra M-504
Integra M-588F
A-803(RI)
Integra A-807
(RI)
Integra A-809
(RI) \& \[
\begin{array}{|l}
\hline B \\
B \\
B \\
1 \\
1
\end{array}
\] \& 0.09
0.003
0.005
0.06
0.008
0.008 \& No
No
Yes
No
No
No \& 60 \& \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& 150
165
200
60
80
105 \& 360 \& \[
\begin{aligned}
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { AB } \\
\& A B \\
\& A B \\
\& A B \\
\& A B \\
\& A B
\end{aligned}
\] \& \& \begin{tabular}{l}
50 \\
20 \\
50 \\
50 \\
50
\end{tabular} \& 80 \({ }^{80}\) \& 2.5 \& Yes
Yes
Yes \& 23
46
64
16

34
37 \& 399.00
870.00
2100.00
365.00

570.00

670.00 \& \& | Multi-room remote capability when used with P-301 preamp. |
| :--- |
| XLR and RCA terminals; optosolated output protection. Low-impedance drive; multi-room emote capability; motorized volume control. |
| ow-impedance drive; anti-EMI ransformer; motorized input elector. |
| As above; opto-drive power upply. | <br>

\hline
\end{tabular}

SD-IOOO SURROUND DECODER

AA-I 660 SIX-CHANNIEL AMPLIFIER


But we think you'll find this first few dozen from Video magazine's technical editor Lance Braithwaite compelling enough to make Proton's new line of high-end monitor/receivers worth A CLOSER LOOK
"PROTON HAS A REPUTATION AS THE FERRARI OF DIRECT-VIEW'TV SETS... THE COMPANY'S 'TVS HAVE EARNED CONSISTENTLY HIGH MARKS FROM REVIEWERS AND VIDEOPHILES."

The other i37I words are equally complimentary. But that's NO SURPRISE GIVEN PROTON'S COMMITMENT TO SUPERB ENGINEERING AND REMARKABLE PICTURE QUALITY. FROM THE MAGNIFICENT LARGE-SCREEN

1ndustrial design of the renote control
Reinhold Weiss Design, Chicago

35-INCH NT-3740 TO THE NEW 2O-INCH V'T-2 I 8 MONITOR/ receiver, Proton packs valuable FEATURES AND PERFORMANCE IN'TO EVERY MONITOR/RECEIVER IT PRODUCES.

But Proton makes more THAN PICTURES PERFECT. ADD PROTON'S SD-IOOO SURROUND DECODER AND POWERFUL NEW AA-I660 SIX-CHANNEL AMPLIFIER FOR A HOME THEATER SYSTEM THAT'S REALLY WORTH STAYING HOME FOR.
'There's a lot more to be SAID ABOUT PROTON, BUT DON'T TAKE OUR WORD FOR IT. CALL TODAY FOR PROTON'S NEW CATALOG, A REPRIN'T of VIDEO'S Videotest AND THE LOCATION OF THE DEALER NEAREST YOU.
$P$ R O TH

I 3855 Struikman Road, Cerritos, CA 90703-1031 Enter No. 99 on Reader Service Card

## AMPLIFIERS



## Advancing the Art. The New T Series from Threshold.

For twenty years, Threshold has used imaginative engineering and unique circuit concepts to advance the art of what is possible in audio design. Threshold products have consistently impressed the most critical music listeners, and continue to receive worldwide acclaim for their uncompromised quality
and craftsmanship. The latest expressions of the sonic eloquence and visual elegance that have come to be synonymous with the Threshold name are now available-the T Series. They await your appreciation at select dealer locations.


T 50
\& T 100
Class A Power Amplifiers

## AMPLIFIERS

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline MANUFACTURER \&  \&  \&  \&  \&  \&  \&  \&  \&  \&  \&  \& WER \& \begin{tabular}{l}
AMP \\
(
\end{tabular} \& - \& \% \& / \&  \&  \& \&  \\
\hline \begin{tabular}{l}
OSC \\
(Continued)
\end{tabular} \& \begin{tabular}{l}
MX 1000a \\
MX1500a \\
MX 2000a \\
EX 800 \\
EX 1250 \\
EX 1600 \\
EX 2500 \\
EX 4000
\end{tabular} \& \[
\begin{array}{|c}
\hline B \\
B \\
B \\
B \\
B \\
B \\
B \\
B \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& 0.1 \\
\& 0.1 \\
\& 0.1 \\
\& 0.1 \\
\& 0.1 \\
\& 0.1 \\
\& 0.1 \\
\& 0.1
\end{aligned}
\] \& Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes \& \& \begin{tabular}{l}
1.1 V \\
1.1 V \\
1.1 V \\
1 V \\
1 V \\
1 V \\
IV \\
1 V
\end{tabular} \& Var.
Var.
Var.
Var.
Var.
Var.
Var.
Var.
Val \& \[
\begin{aligned}
\& 250 \\
\& 350 \\
\& 450 \\
\& 175 \\
\& 275 \\
\& 400 \\
\& 500 \\
\& 720
\end{aligned}
\] \& \[
\begin{aligned}
\& 350 \\
\& 500 \\
\& 650 \\
\& 275 \\
\& 400 \\
\& 600 \\
\& 750 \\
\& 1100
\end{aligned}
\] \& \[
\begin{aligned}
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& H \\
\& H \\
\& H \\
\& A B \\
\& H \\
\& H \\
\& H \\
\& H \\
\& H
\end{aligned}
\] \& \[
\begin{aligned}
\& 3 \\
\& 3 \\
\& 3 \\
\& 3 \\
\& 2 \\
\& 3 \\
\& 3 \\
\& 3 \\
\& 3
\end{aligned}
\] \& \[
t
\] \& \& \& \& \[
\begin{aligned}
\& 42 \\
\& 42 \\
\& 54 \\
\& 40 \\
\& 42 \\
\& 44 \\
\& 55 \\
\& 64
\end{aligned}
\] \& \[
\begin{aligned}
\& 1028.00 \\
\& 1258.00 \\
\& 1718.00 \\
\& 1045.00 \\
\& 1295.00 \\
\& 1595.00 \\
\& 2095.00 \\
\& 2495.00 \\
\& \hline
\end{aligned}
\] \& \& \begin{tabular}{l}
As above; optional XLR inputs. As above. \\
As above. \\
Optional computer control. \\
As above. \\
As above. \\
As above. \\
As above.
\end{tabular} \\
\hline QUAD \& \begin{tabular}{|l|l}
306 \\
\& 606 \\
\(240(R O)\) \\
520
\end{tabular} \& \[
\begin{array}{|l|}
\hline B \\
B \\
B \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& 0.01 \\
\& \\
\& 0.01 \\
\& 0.01 \\
\& 0.01
\end{aligned}
\] \& No
No
Yes
Yes \& \& \[
\begin{array}{|l}
\hline 375 \\
500 \\
\text { Var. } \\
\text { Var. }
\end{array}
\] \& \begin{tabular}{l} 
No \\
No \\
No \\
No \\
\hline
\end{tabular} \& \[
\begin{array}{|l}
80 \\
180 \\
80 \\
110 \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& 110 \\
\& 240 \\
\& 110 \\
\& 175 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { A } \\
\& \text { A } \\
\& A \\
\& A
\end{aligned}
\] \& 1.5
1.5
1.5
1.5 \& \[
\begin{aligned}
\& 20 \\
\& 20 \\
\& 10 \\
\& 10 \\
\& \hline
\end{aligned}
\] \& \& \& \& \[
\begin{array}{|l|}
\hline 10 \\
25 \\
12 \\
29 \\
\hline
\end{array}
\] \& \[
\begin{array}{r}
749.00 \\
1449.00 \\
1199.00 \\
1599.00
\end{array}
\] \& \& \begin{tabular}{l}
Feed-forward error-correctión circuitry; current-dumping design. As above. \\
As above. \\
As above.
\end{tabular} \\
\hline QUICKSILVER AUDIO \& \begin{tabular}{|l} 
GLA \\
KT-88 Mono \\
Silver Mono \\
M-80 \\
M-135
\end{tabular} \& \begin{tabular}{l}
B/T \\
B/T/M \\
B/T/M \\
B/T/M \\
B/T/M
\end{tabular} \& \& No
No
No
No
No \& \& \& No \(\begin{gathered}\text { No } \\ \text { No } \\ \text { No } \\ \text { No } \\ \text { No } \\ \text { No }\end{gathered}\) \& 40
60
90
80
135 \& 40
60
90
80
135 \& ( \(\begin{aligned} \& 13-55 \\ \& 13-55 \\ \& 16-80 \\ \& 13-60 \\ \& 10-150\end{aligned}\) \& \(A B\)
\(A B\)
\(A B\)
\(A B\)
\(A B\) \& \& 100
100
100
100
100 \& \& \& \& \[
\begin{aligned}
\& 42 \\
\& 30 \\
\& 36 \\
\& 34 \\
\& 70
\end{aligned}
\] \& 1195.00
897.50
Each
1225.00
Each
1497.50
Each
320.00
Each \& \& \\
\hline RANE \& \[
\begin{aligned}
\& \text { MA 6S } \\
\& \text { SSA } 6
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline \mathrm{B} \\
\mathrm{~B} \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& 0.07 \\
\& 0.07 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { Yes } \\
\& \text { No }
\end{aligned}
\] \& \& \[
\begin{aligned}
\& 775 \\
\& 775 \\
\& \hline
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline \text { No } \\
\text { No }
\end{array}
\] \& \[
\begin{aligned}
\& 100 \\
\& 100 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 150 \\
\& 150 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 10-55 \\
\& 10-55 \\
\& \hline
\end{aligned}
\] \& \[
\begin{array}{|l}
\hline A B \\
A B \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& 1 \\
\& 1
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline 20 \\
20 \\
\hline
\end{array}
\] \& \& \& \& \[
\begin{aligned}
\& 33 \\
\& 33 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 1599.00 \\
\& 1599.00 \\
\& \hline
\end{aligned}
\] \& \& Six-channel operation; bridgeable. As above. \\
\hline RBH SOUND \& \[
\begin{aligned}
\& \hline \text { TA-350 } \\
\& \text { TS-200 }
\end{aligned}
\] \& B B/M \& \[
\begin{aligned}
\& 0.05 \\
\& 0.05
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \& \[
\begin{aligned}
\& \mathrm{IV} \\
\& \mathrm{IV}
\end{aligned}
\] \& No \& \[
\begin{aligned}
\& 150 \\
\& 200
\end{aligned}
\] \& 275 \& \[
\begin{aligned}
\& 20-25 \\
\& 20-25
\end{aligned}
\] \& \[
\begin{aligned}
\& \mathrm{AB} \\
\& \mathrm{AB}
\end{aligned}
\] \& \[
\begin{aligned}
\& 1.5 \\
\& 1.7
\end{aligned}
\] \& \[
\begin{array}{|l}
100 \\
100
\end{array}
\] \& \& \& \& \[
\begin{aligned}
\& 36 \\
\& 33
\end{aligned}
\] \& \[
\begin{array}{r}
799.00 \\
499.00 \\
\text { Each }
\end{array}
\] \& \& \begin{tabular}{l}
Five-channel operation, 150 watts \(\times 2\) and 75 watts \(\times 3\). \\
Subwoofer amp; variable crossover frequency; variable boost.
\end{tabular} \\
\hline RCA \& PA4500M \& B \& 0.5 \& Yes \& 20 \& 900 \& Var. \& 50 \& 80 \& 20-20 \& AB \& 1.2 \& 3 \& \& \& \& \& 199.00 \& \& Four-channel operation. \\
\hline REFERENCE LINE AUDIO \& Preeminence One Preeminence Two Preeminence .5 \& \begin{tabular}{l}
B \\
B/M \\
B/M
\end{tabular} \& \[
\begin{aligned}
\& 0.01 \\
\& 0.01 \\
\& 0.01
\end{aligned}
\] \& No Yes No \& \& \[
\begin{aligned}
\& 500 \\
\& 500 \\
\& 500
\end{aligned}
\] \& No \& \[
\begin{aligned}
\& 100 \\
\& 200 \\
\& 100
\end{aligned}
\] \& \[
\begin{aligned}
\& 200 \\
\& 400 \\
\& 200
\end{aligned}
\] \& \[
\begin{aligned}
\& 0-100 \\
\& 0-100 \\
\& 0-100
\end{aligned}
\] \& \begin{tabular}{l}
A \\
A
\[
\dagger
\]
\end{tabular} \& \& \[
\begin{aligned}
\& 100 \\
\& 100 \\
\& 100
\end{aligned}
\] \& \& \& \& \[
\begin{aligned}
\& 70 \\
\& 70 \\
\& 35
\end{aligned}
\] \& \[
\begin{array}{r}
3995.00 \\
3995.00 \\
\text { Each } \\
2095.00 \\
\text { Each } \\
\hline
\end{array}
\] \& \& \begin{tabular}{l}
Differential circuitry. \\
As above. \(\dagger\) Single-ended Class-A.
\end{tabular} \\
\hline REGA RESEARCH \& \begin{tabular}{|l} 
Brio \\
Elex II \\
Elicit \\
Stereo \\
The Mono
\end{tabular} \& \[
\begin{array}{|l|}
\hline l \\
1 \\
1 \\
1 \\
B \\
B / M \\
\hline
\end{array}
\] \& \& \& \& \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \begin{tabular}{l}
\hline 35 \\
50 \\
80 \\
80 \\
160
\end{tabular} \& \& \& \[
\begin{aligned}
\& A B \\
\& A B
\end{aligned}
\] \& \& \& \& \& \begin{tabular}{|l|}
\hline No \\
No \\
Yes \\
\hline
\end{tabular} \& \& \[
\begin{array}{r}
399.00 \\
699.00 \\
1299.00
\end{array}
\] \& \& \\
\hline REICHERT \& \(300 B-S E\)
\(300 B-P P\)
\(2 A 3-P P\) \& \begin{tabular}{l}
B/T/M \\
B/T/M \\
B/T/M
\end{tabular} \& \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \& \[
\begin{aligned}
\& 400 \\
\& 400 \\
\& 500
\end{aligned}
\] \& No
No
No \& \[
\begin{aligned}
\& 7 \\
\& 25 \\
\& 10
\end{aligned}
\] \& \[
\begin{aligned}
\& 7 \\
\& 25 \\
\& 10
\end{aligned}
\] \& \[
\begin{aligned}
\& 20-20 \\
\& 20-20 \\
\& 20-20
\end{aligned}
\] \& \[
\begin{aligned}
\& A \\
\& A \\
\& A
\end{aligned}
\] \& \& \[
\begin{aligned}
\& 100 \\
\& 100 \\
\& 100
\end{aligned}
\] \& \& \& \& \& \[
\begin{array}{r}
5900.00 \\
\text { Pair } \\
7500.00 \\
\text { Pair } \\
6100.00 \\
\text { Pair }
\end{array}
\] \& \& \begin{tabular}{l}
Triode tubes. \\
As above. \\
As above.
\end{tabular} \\
\hline ROTEL \& RA-930AX
RA-935BX
RA-980BX
RB-930AX
RB-956AX
RB-970BX
RB-980BX
RB-990BX
RHB-10 \& \[
\begin{array}{|l}
\hline 1 \\
\hline 1 \\
1 \\
B \\
B \\
\hline \\
B \\
B \\
B \\
B
\end{array}
\] \& 0.03
0.05
0.03
0.03
0.03

0.03
0.03
0.03
0.03 \& No
No
$\mathrm{N}_{0}$
$\mathrm{~N}_{0}$
$\mathrm{~N}_{0}$
$\mathrm{No}_{0}$
$\mathrm{~N}_{0}$
No
No \& 40 \& 150
210
150
1 V
1V
IV
IV
IV
775 \& No
No
No
No
No
No
No
No
No
No
No \& 30
40
100
30
30
60
120
200

200 \& 330 \& $$
\begin{aligned}
& 20-20 \\
& 20-20 \\
& 20-20 \\
& 20-20 \\
& 20-20 \\
& 20-20 \\
& 20-20 \\
& 20-20 \\
& 20-20
\end{aligned}
$$ \& $A B$

$A B$
$A B$
$A B$
$A B$
$A B$
$A B$
$A B$
$A B$ \& \& 20
15
33
27
27
27
33
33

30 \& 80 \& $$
\begin{aligned}
& 2.5 \\
& 2.5
\end{aligned}
$$ \& \[

$$
\begin{array}{|l|}
\hline \mathrm{Yes} \\
\mathrm{No} \\
\mathrm{Yes}
\end{array}
$$
\] \& 13

13
22
14
23
15
22
34
63 \& 299.90
349.90
699.90
249.90
499.90
379.90
599.90
999.90

2699.90 \& \& | Preamp out/main in jacks. |
| :--- |
| Six-channel operation; bridges to 90 watts $\times 3$. |
| Bridges to 180 watts. |
| Bridges to 360 watts. | <br>

\hline JEFF ROWLAND DESIGN GROUP \& $$
\begin{aligned}
& \hline 9 \\
& 8 \\
& 6 \\
& 2 \\
& 1 \\
& \hline
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& \mathrm{B} / \mathrm{M} \\
& B \\
& B / M \\
& B \\
& B
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.02 \\
& 0.02 \\
& 0.01 \\
& 0.01 \\
& 0.04
\end{aligned}
$$

\] \& | Yes Yes Yes |
| :--- |
| Yes Yes | \& \[

$$
\begin{aligned}
& 50 \\
& 80 \\
& 30 \\
& 30 \\
& 70 \\
& \hline
\end{aligned}
$$
\] \& 136

136
136
136

136 \& $$
\begin{array}{|l|}
\hline \text { Sel. } \\
\text { Sel. } \\
\text { No } \\
\text { No } \\
\text { Nel. } \\
\hline
\end{array}
$$ \& 350

250
150
75

60 \& $$
\begin{aligned}
& 700 \\
& 500 \\
& 250 \\
& 125 \\
& 120 \\
& \hline 1
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& 0.1-160 \\
& 0.1-160 \\
& 0.5-150 \\
& 0.5-150 \\
& 0.3-300 \\
& \hline
\end{aligned}
$$
\] \& AVAB

AVAB
AVAB
AAB

AAB \& \& | Sel. |
| :--- |
| Sel |
| Sel. |
| Sel |
| Sel | \& \& \& \& \[

$$
\begin{aligned}
& 225 \\
& 150 \\
& 90 \\
& \text { Pair } \\
& 47 \\
& 48
\end{aligned}
$$

\] \& \[

$$
\begin{array}{r}
24.500 \\
\text { Pair } \\
9800.00 \\
8500.00 \\
\text { Pair } \\
4500.00 \\
3100.00
\end{array}
$$

\] \& \& | Four chassis; available with a.c. or battery power supplies. Optional battery power supply, $\$ 3000.00$. |
| :--- |
| As above but $\$ 5200.00$ (per pair). |
| As above but $\$ 2600.00$. Bridgeable. | <br>

\hline SANSUI \& AV90000SP(RI)

AUX619R \&  \& $$
\begin{aligned}
& 0.03 \\
& 0.03 \\
& \hline
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No } \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 100 \\
& 100 \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 150 \\
& 150 \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline \text { No } \\
\\
\hline
\end{array}
$$

\] \&  \& 120 \& \[

$$
\begin{aligned}
& 20-20 \\
& 20-20
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& A B \\
& A B
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l|l}
1.4 \\
1.4 \\
\hline
\end{array}
$$

\] \& \[

47
\]

$$
47
$$ \& \[

$$
\begin{array}{|c}
72 \\
83 \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline 2.5 \\
2.5 \\
\hline
\end{array}
$$

\] \& No \& \[

$$
\begin{array}{|l}
32 \\
25
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 1000.00 \\
& 600.00
\end{aligned}
$$
\] \& \& AN amp with Dolby Pro Logic and DSP. $\dagger$ Front, 80 watts $\times 2$; center ${ }_{r}$ 20 watts; rear, 80 watts $\times 2$. <br>

\hline SENTEC \& PA9 \& B/M \& 0.03 \& No \& 50 \& IV \& No \& 60 \& 100 \& 10-60 \& AB \& 1.1 \& 12 \& \& \& \& 9 \& $$
\begin{array}{r}
600.00 \\
\text { Each }
\end{array}
$$ \& \& Low-feedback design. <br>

\hline SESCOM \& | R/S 30 W |
| :--- |
| R/S SP |
| P0-3 |
| P0-4 |
| P0-5 |
| P0-58 | \& \[

$$
\begin{array}{|l}
\hline \mathrm{B} / \mathrm{M} \\
\mathrm{~B} \\
\mathrm{~B} \\
\mathrm{~B} / \mathrm{M} \\
\mathrm{I} \\
\mathrm{~B} \\
\hline
\end{array}
$$
\] \& 0.01

0.01
0.01
0.01
0.01
0.01 \& Yes
Yes
No
No
No

No \& \& \[
$$
\begin{aligned}
& \hline 1 V \\
& 1 \mathrm{~V} \\
& 100 \\
& 100 \\
& 100 \\
& 100 \\
& \hline
\end{aligned}
$$

\] \& | No |
| :--- |
| No |
| No |
| No |
|  |
| No |
| No | \& \[

$$
\begin{aligned}
& 30 \\
& 8 \\
& 2 \\
& 4 \\
& 2 \\
& 2 \\
& \hline
\end{aligned}
$$

\] \& \& \[

$$
\begin{aligned}
& 20-20 \\
& 20-20
\end{aligned}
$$

\] \& \& \& \[

$$
\begin{array}{|l}
\hline 15 \\
15 \\
10 \\
10 \\
10 \\
10 \\
\hline
\end{array}
$$

\] \& \& \& \& \[

$$
\begin{array}{|l}
\hline 10 \\
7 \\
1 \\
1 \\
1 \\
1 \\
2 \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{array}{r}
200.00 \\
\text { Each } \\
150.00 \\
75.65 \\
175.75 \\
\text { Each } \\
207.35 \\
191.00
\end{array}
$$

\] \& \& | Half-rack size. |
| :--- |
| As above; kit, $\$ 100.00$. Requires $\mathrm{PO}-1$ power supply. As above. |
| As above. | <br>

\hline SIGNATURE

TECHNOLOGIES \& $$
\begin{aligned}
& \text { SRa-8 } \\
& \text { SRa-5 }
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& B / H \\
& B / H
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \hline 0.03 \\
& 0.03
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \mathrm{No} \\
& \text { No }
\end{aligned}
$$

\] \& \& \& \[

$$
\begin{array}{|l|}
\hline \text { No } \\
\text { No }
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 35 \\
& 50 \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline 35 \\
50
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 30-21 \\
& 30-21
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline A \\
A \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 1.2 \\
& 1.2
\end{aligned}
$$

\] \& \& \& \& \& \[

$$
\begin{array}{|l}
30 \\
40 \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 1695.00 \\
& 1995.00 \\
& \hline
\end{aligned}
$$
\] \& \& Strappable; adjustable bias. As above. <br>

\hline SM AUDIO \& Studio Series Signature Series \& $$
\mathrm{s} \stackrel{\mathrm{~B}}{\mathrm{~B} / \mathrm{M}}
$$ \& \[

$$
\begin{aligned}
& 0.02 \\
& 0.02
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l}
\hline \text { No } \\
\text { Yes }
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& \hline 100 \\
& 100
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 800 \\
& 1 \mathrm{~V}
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline \text { No } \\
\text { No }
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 80 \\
& 100
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 160 \\
& 200
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 20-20 \\
& 15-50
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \mathrm{AB} \\
& \mathrm{AB}
\end{aligned}
$$

\] \& \& \[

$$
\begin{array}{|l|}
\hline 50 \\
50
\end{array}
$$

\] \& \& \& \& \[

$$
\begin{aligned}
& 30 \\
& 42
\end{aligned}
$$

\] \& | 979.00 899.00 |
| :--- |
| Each | \& \& <br>

\hline SONANCE \& Sonamp 2120 Sonamp 260 \& $$
\begin{array}{|l}
\hline B \\
B \\
\hline
\end{array}
$$ \& \[

$$
\begin{aligned}
& 0.05 \\
& 0.05
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No }
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 20 \\
& 20
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 900 \\
& 700
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline \text { No } \\
\text { No }
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 120 \\
& 60
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 160 \\
& 100
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline 20-20 \\
20-20
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& \mathrm{AB} \\
& \mathrm{AB}
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 1.3 \\
& 1.2
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l}
56 \\
56
\end{array}
$$

\] \& \& \& \& \& \[

$$
\begin{aligned}
& 575.00 \\
& 349.00
\end{aligned}
$$

\] \& \& | Auto on. |
| :--- |
| As above; 125 watts into 2 ohms; with three-speaker switching, Sonamp 260X3, \$399.00. | <br>

\hline
\end{tabular}




PONTIAC CARES with a 3-year/36,000-mile no-deductible bumper-to-bumper limited warranty (see your dealer for details), plus free 24-hour Roadside Assistance and Courtesy Transportation. Call 1-800-762-4900 for more product information and dealer locations. © Always wear safety belts, even with airbags. © 1993 GM Corp. All Rights Reserved.


The promise of its athletic look is fulfilled by the exhilaration of its 210-horsepower 24-valve V6 and turbine-smooth transmission, while the control generated by its sport suspension and available anti-lock disc brakes is enhanced by the safety of its dual airbags.


The new Grand Prix ${ }^{\text {m }}$ Sport Coupe.
Purposefully designed, comprehensively equipped, wonderfully invigorating. A megadose of high-quality excitement
for today's driving enthusiasts.


## AMPLIFIERS

| MANU |  |  |  |  |  |  |  |  |  |  |  | WER | $\frac{A M P}{8}$ | / | \% |  |  |  |  | ${ }^{s_{81}} \mathrm{O}_{\mathrm{N}}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SYMPHONIC <br> LINE | Kraft 250 <br> Reference <br> RG1 MKIII <br> RG4 MKIII <br>  <br> RG7 <br> RG9 <br> RG11 | $B / M$ <br> $B$ <br> $B / M$ <br> $B$ <br> 1 <br> $B$ | $\begin{aligned} & 0.02 \\ & 0.05 \\ & 0.05 \\ & 0.05 \\ & 0.05 \\ & 0.05 \\ & \hline 0.05 \\ & \hline \end{aligned}$ | Yes No Yes No No No | $\begin{array}{\|l\|} \hline 120 \\ 70 \\ 100 \\ \\ 90 \\ 70 \\ 70 \\ \hline \end{array}$ | 200 150 180 150 150 150 | $\begin{aligned} & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \end{aligned}$ | 250 100 150 130 90 70 | 500 200 300 250 160 130 | $1.5-1 \mathrm{M}$ $10-400$ $1.5-600$ $10-500$ $10-300$ $10-300$ | A A/AB A/AB A/AB A/AB A/AB | 0.6 0.8 0.8 0.8 1.2 1.2 | 47 $\begin{array}{r} 50 \\ 50 \\ 50 \\ 50 \\ 50 \\ \hline \end{array}$ | 75 | 2.5 | Yes | 550 60 120 60 45 35 | $\begin{array}{r} 25,000 \\ \text { Pair } \\ 3950.00 \\ 9950.00 \\ \text { Pair } \\ 5600.00 \\ 3500.00 \\ 2200.00 \\ \hline \end{array}$ |  | Separate preamp out. Bridgeable. |
| TEAC | $\begin{aligned} & \text { A-X5030 } \\ & \mathrm{A}-\times 3030 \\ & \mathrm{~A}-\mathrm{X} 1030 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 1 \\ 1 \\ 1 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 0.007 \\ 0.008 \\ .0085 \\ \hline \end{array}$ | $\begin{aligned} & \text { No } \\ & \text { No } \\ & \text { No } \\ & \hline \end{aligned}$ |  | $\begin{array}{\|l\|} 150 \\ 150 \\ 150 \\ \hline \end{array}$ |  | $\begin{aligned} & 75 \\ & 60 \\ & 40 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 100 \\ 75 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 20-20 \\ & 20-20 \\ & 20-20 \\ & \hline \end{aligned}$ |  |  | $\begin{aligned} & 47 \\ & 47 \\ & 47 \end{aligned}$ | 80 72 72 | $\begin{aligned} & 2.5 \\ & 2.5 \\ & 2.5 \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { No } \\ & \text { No } \end{aligned}$ | $\begin{array}{\|l} 23 \\ 20 \\ 17 \\ \hline \end{array}$ | $\begin{aligned} & 450.00 \\ & 380.00 \\ & 290.00 \end{aligned}$ |  |  |
| TECHNICS | $\begin{aligned} & \text { SU-V660 } \\ & \text { SU-V460 } \end{aligned}$ | 1 | 0.005 <br> 0.007 |  |  | $\begin{array}{\|l\|} \hline 100 \\ 130 \\ \hline \end{array}$ |  | $\begin{array}{\|l\|} \hline 90 \\ 50 \\ \hline \end{array}$ | $\begin{aligned} & 110 \\ & 60 \\ & \hline \end{aligned}$ | $\begin{array}{\|r\|} \hline 20-20 \\ 20-20 \\ \hline \end{array}$ | $\begin{aligned} & \mathrm{AA} \\ & \mathrm{AA} \end{aligned}$ | $\begin{array}{\|l} \hline 0.6 \\ 0.6 \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 18 \end{aligned}$ | $\begin{aligned} & 79 \\ & 77 \\ & \hline \end{aligned}$ | $\begin{aligned} & 0.25 \\ & 0.35 \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { No } \end{aligned}$ | $\begin{array}{\|l} 25 \\ 18 \end{array}$ | $\begin{aligned} & 429.95 \\ & 329.95 \end{aligned}$ |  | Direct power amp inputs. As above. |
| THRESHOLD | T50 T100 T200 T400 S550/e SA12/e | $\begin{array}{\|l\|} \hline B \\ B \\ B \\ B \\ B \\ B / M \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 0.1 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0.1 \end{array}$ | Yes Yes Yes Yes Yes Yes | 180 180 180 180 50 50 |  | No No No No No No No | $\begin{array}{\|l} \hline 50 \\ 60 \\ 100 \\ 150 \\ 250 \\ 250 \end{array}$ | 100 120 200 300 500 500 | $\begin{aligned} & 0-100 \\ & 0-100 \\ & 0-100 \\ & 0-100 \\ & 0-100 \\ & 0-100 \end{aligned}$ | A <br> $A$ <br> $A$ <br> $A$ <br> $A$ <br> $A / A B$ <br> $A$ |  | $\begin{aligned} & 47 \\ & 47 \\ & 47 \\ & 47 \\ & 47 \\ & 47 \end{aligned}$ |  |  |  |  | $\begin{aligned} & \hline 2190.00 \\ & 2850.00 \\ & 4200.00 \\ & 5250.00 \\ & 6300.00 \\ & 7200.00 \\ & \hline \end{aligned}$ |  | Bridges to 180 watts. Bridges to 330 watts. Bridges to 450 watts. Stasis design. As above. |
| TIMES ONE | RFM 800 RFS 400 PS 400 PS 300 THS-6 THS-5 | $\begin{array}{\|l\|} \hline B \\ B \\ B \\ B \\ B \\ \hline \end{array}$ | $\begin{aligned} & 0.5 \\ & 0.5 \\ & 0.1 \\ & 0.1 \\ & 0.1 \\ & 0.1 \end{aligned}$ | Yes Yes Yes Yes No No | 130 130 60 60 60 60 | $\begin{aligned} & 750 \\ & 750 \\ & 1.2 \mathrm{~V} \\ & 1.2 \mathrm{~V} \\ & 1.2 \mathrm{~V} \\ & 1.2 \mathrm{~V} \end{aligned}$ | No No No No No No | 200 125 100 100 60 100 | $\begin{aligned} & 400 \\ & 250 \\ & 200 \\ & 200 \\ & \\ & 110 \end{aligned}$ | $\begin{array}{\|l\|} \hline 13-250 \\ 13-200 \\ 5-75 \\ 5-75 \\ 5-75 \\ 5-75 \end{array}$ | AB1 AB1 AB1 AB1 $A B 1$ $A B 1$ | 3 3 1.1 1.4 1.4 1.0 | 50 50 24 24 24 33 |  |  |  | $\begin{aligned} & 43 \\ & 33 \\ & 30 \\ & 25 \\ & 35 \\ & 40 \end{aligned}$ | 2450.00 1980.00 950.00 750.00 1450.00 990.00 |  | Low-feedback design. As above. Regulated power supply. As above. Surround/multi-room amp; six-channel operation. As above but five-channe operation. |
| $\begin{aligned} & \text { TUBE RESEARCH } \\ & \text { LABS } \end{aligned}$ | GTPR800 GTR800 GTP400 GT400 TR300 | $B / T / M$ <br> B/T/M <br> B/T/M <br> $B / T / M$ <br> $B / T / M$ |  |  |  | $\begin{aligned} & 1 \mathrm{~V} \\ & 1 \mathrm{~V} \\ & 1 \mathrm{~V} \\ & 1 \mathrm{~V} \\ & 1.4 \mathrm{~V} \end{aligned}$ |  | $\begin{aligned} & 800 \\ & 800 \\ & 400 \\ & 400 \\ & 300 \end{aligned}$ | $\begin{aligned} & 800 \\ & 800 \\ & 400 \\ & 400 \\ & 300 \end{aligned}$ |  | Var. Var. Var. Var. Var. |  | $\begin{array}{\|c} 150 \\ 150 \\ 150 \\ 150 \\ 270 \end{array}$ |  |  |  | 405 400 225 220 130 | $\begin{array}{r} 60,000 \\ \text { Pair } \\ 45,000 . \\ \text { Pair } \\ 35,000 . \\ \text { Pair } \\ 27,000 \\ \text { Pair } \\ 15,000 . \\ \text { Pair } \end{array}$ |  | riode operation; switchabie to 600-watt pentode operation. <br> As above but switchable to 800 -watt pentode. |
| VAC | PA 80/80 PA 80/80। PA 90C PA 160 PA 150 MkII Renaissance 140 MkII Renaissance $70 / 70$ MkII Renaissance $30 / 30$ | $\begin{aligned} & 8 / T \\ & 1 / T \\ & B / T / M \\ & B / T / M \\ & B / T / M \\ & B / T / M \\ & B / T \\ & B / T \end{aligned}$ | 0.35 0.35 0.35 0.35 0.35 0.7 0.7 0.12 | No No Opt. Opt. Opt. No No No |  | $\begin{gathered} 700 \\ 700 \\ 700 \\ 700 \\ 500 \\ 500 \\ 500 \end{gathered}$ | $\begin{gathered} \mathrm{No} \\ \mathrm{No} \\ \mathrm{No} \\ \mathrm{No} \\ \mathrm{No} \\ \mathrm{No} \\ \mathrm{No} \\ \mathrm{No} \\ \mathrm{No} \\ \hline \end{gathered}$ | 80 80 120 160 155 137 68 32 | 80 80 120 160 155 137 68 32 | $\begin{aligned} & 7-100 \\ & 7-100 \\ & 7-72 \\ & 8-85 \\ & 8-50 \\ & 8-85 \\ & 8-85 \end{aligned}$ | AB1 AB1 A AB1 A A A A |  | 100 100 100 100 100 100 100 100 |  |  |  | $\begin{aligned} & 55 \\ & 60 \\ & 140 \\ & 100 \\ & 160 \\ & 260 \\ & 130 \\ & 110 \end{aligned}$ | $\begin{array}{r} 2490.00 \\ 2890.00 \\ 6990.00 \\ \text { Pair } \\ 4690.00 \\ \text { Pair } \\ 9500.00 \\ \text { Pair } \\ 19,500 . \\ \text { Pair } \\ 9800.00 \\ 4990.00 \end{array}$ |  | Adjustable bias with front-panel indicators; operates into 2 ohms. As above; three line inputs; ne tape loop; passive controls. riode switchable; variable eedback; operates into 2 ohms; ptional balanced inputs, $\$ 500.00$. Ultra-linear or triode switchable: adjustable bias with front-panel ndicators; operates into 2 ohms. riode switchable, variable eedback. <br> riode tubes; zero teedback; variable grounding; operates into ohms. <br> s above; 16 power supplies. <br> As above. |
| J. C. VERDIER | Le 210 Mk II Le 220 L'Audiobloc Mk II | $\begin{aligned} & \hline \mathrm{B} / \mathrm{T} \\ & \mathrm{~B} / \mathrm{T} \\ & \mathrm{I} / \mathrm{T} \end{aligned}$ | $\begin{aligned} & \hline 0.4 \\ & 0.4 \\ & 0.4 \end{aligned}$ | $\begin{aligned} & \text { No } \\ & \text { No } \\ & \text { No } \end{aligned}$ |  |  |  | $\begin{aligned} & 10 \\ & 20 \\ & 20 \end{aligned}$ | $\begin{aligned} & 10 \\ & 20 \\ & 20 \end{aligned}$ | $\begin{aligned} & 20-60 \\ & 20-60 \\ & 20-60 \end{aligned}$ | $\begin{aligned} & A \\ & A \\ & A \end{aligned}$ |  |  |  |  |  | $\begin{aligned} & 27 \\ & 27 \\ & 31 \end{aligned}$ | $\begin{aligned} & 2200.00 \\ & 2400.00 \\ & 3450.00 \end{aligned}$ |  | Vith line stage, $\$ 2550.00$. |
| VIRTUAL IMAGE <br> VTL | Stereobloc Twenty Forty | ${ }^{8 / T}$ | 1 | No |  | 1.3 V | No | 18 | 18 | 15-25 | AB | ${ }^{3}$ | 51 |  |  |  | 38 | 4000.00 |  | Bridges to 36 watts; triode output; djustable negative feedback; -, 8-, and 16-0hm taps. |
| VTL | ST-80 ST-125 MB-100 MB-150 MB-25t MB-225t MB-300 MB-600 (IChiban) |  | 1.0 1.0 1.0 1.0 1 1.0 1.0 1.0 | No No Opt. Opt. Opt. Opt. Opt. Opt. | 20 30 20 30 20 30 30 30 | 1.4 V 1.4 V 1.4 V 1.4 V 750 1.4 V 1.4 V 1.4 V | $\begin{aligned} & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \end{aligned}$ | 80 125 100 140 25 225 300 600 | 80 125 100 140 25 225 300 600 | $\begin{aligned} & 20-30 \\ & 20-40 \\ & 20-35 \\ & 15-40 \\ & 25-18 \\ & 15-40 \\ & 15-40 \\ & 15-40 \end{aligned}$ | AB1 $A B 1$ $A B 1$ $A B 1$ $A B 1$ $A B 1$ $A B 1$ $A B 1$ | 1.3 1.3 1.5 1.5 1.0 1.3 2.5 2.2 | 135 135 135 135 135 135 135 135 |  |  |  | $\begin{aligned} & 32 \\ & 47 \\ & 34 \\ & 46 \\ & 13 \\ & 60 \\ & 75 \\ & 75 \\ & 135 \end{aligned}$ | $\begin{array}{r} 1590.00 \\ 2690.00 \\ 2990.00 \\ \text { Pair } \\ 3990.00 \\ \text { Pair } \\ 899.00 \\ \text { Pair } \\ 4990.00 \\ \text { Pair } \\ 5990.00 \\ \text { Pair } \\ 11,990 . \\ \text { Pair } \end{array}$ |  | witchable to 50 -watt triode peration. ab above. <br> s above but 60 watts. <br> riode operation. <br> s above. <br> witchable to 150 -watt triode peration. <br> s above but 300 watts. |
| WAAS AUDIO~DIGITAL | 1200 <br> 1400 <br> 440 | $\mathrm{B} / \mathrm{H}$ <br> $\mathrm{B} / \mathrm{H}$ <br> $\mathrm{B} / \mathrm{H}$ <br> B | 0.3 0.4 0.4 | Yes Yes Yes | 15 |  | $\begin{aligned} & \text { No } \\ & \text { No } \\ & \text { No } \end{aligned}$ | $\begin{aligned} & 200 \\ & 700 \\ & 220 \\ & \hline \end{aligned}$ | 200 | $\begin{array}{\|l\|} \hline 3-40 \\ 3-35 \\ \\ 3-35 \\ \hline \end{array}$ | $\begin{array}{\|l} \mathrm{A} \\ \mathrm{~A} \\ \mathrm{~A} \end{array}$ | $\begin{aligned} & 2.0 \\ & 1.5 \\ & 1.5 \end{aligned}$ | $\begin{aligned} & 43 \\ & 43 \\ & 43 \end{aligned}$ |  |  |  | $\begin{aligned} & 54 \\ & 56 \\ & 45 \end{aligned}$ | $\begin{aligned} & 3400.00 \\ & 6000.00 \\ & 2400.00 \end{aligned}$ |  | Six-channel operation. aser and fiber-optic volume ontrols. s above. |
| WAVELENGTH AUDIO | Cardinal <br> Lambda Trumpet | $\begin{aligned} & \mathrm{B} / \mathrm{T} / \mathrm{M} \\ & \mathrm{~B} / \mathrm{T} \\ & \mathrm{~B} / \mathrm{T} \end{aligned}$ |  | $\begin{aligned} & \text { Opt. } \\ & \text { No } \\ & \text { No } \end{aligned}$ | $\begin{aligned} & 15 \\ & 20 \\ & 12 \end{aligned}$ | $\begin{aligned} & 1.1 \mathrm{~V} \\ & 1 \mathrm{~V} \end{aligned}$ | $\begin{aligned} & \text { No } \\ & \text { No } \\ & \text { No } \end{aligned}$ | $\begin{aligned} & 7.5 \\ & 15 \\ & 3.5 \end{aligned}$ | $\begin{aligned} & 7.5 \\ & 15 \\ & 3.5 \end{aligned}$ | $\begin{aligned} & 15-35 \\ & \\ & 20-25 \\ & 15-50 \end{aligned}$ | $\begin{aligned} & \mathrm{A} \\ & \mathrm{AB} \\ & \mathrm{~A} \end{aligned}$ |  | $\begin{array}{\|l\|} \hline 100 \\ 100 \\ 100 \end{array}$ |  |  |  | $\begin{aligned} & 38 \\ & 40 \\ & 40 \end{aligned}$ | $\begin{array}{r} 3950.00 \\ \text { Pair } \\ 3500.00 \\ 3250.00 \end{array}$ |  | Irode tubes. <br> irect-coupled. |

AMPLIFIERS



## Affordable tave Excellence

Most rusic lovers agree that tube amplification has always offered superior musicality, but previously rended ic be very expensive... until now.

Vaculm Tube _ogic, a world leader in tube amplifier designs, introduces a rew 80 watt/channel stereo iube amplifier and an al. tube Line Stage. Lush, three cimensional sound is the reward... The price? Surprisingly affordaile.


## ST-80

We proucly offer a rew VTL Amplifier for less than $\$ 1600$. Sti I offering a fl II measure of "'TLL sound," but' af゙ a real wo-ld price. No cther pure tube amplifier of this power ratig exists at anywhere near its modest price. An audiothile "best buv."

## TL-2

This pure tube line stage offers a highly musical control prearnp for CD-based szstems. Warm, rich, three dime zsional sound that belies its less than \$1000 price. An optional separate phono stage is avai able for under \$900. (TP-2)


## State of the pube Art

For the less budget conscious, we are proud to offer our tof of the range amplifiers and preamp'ifiers that इre without sonic compromise. Vacuum Tube Logic is the leader in ofering the highest power tube amplifiers with the best reliability, at prices a lot less than you would think.


## MB-10D

Eight yea's of refinement has producec an amplifier of unparalkled clarit, and musicality. One listen, and you'll understand why this is one of the most favorably reviewed tube amplifiers ever produced. Rated at 100 watts (typically 130) per channel in tetrode mode, and front pa zel switcheble to triode mode at 45 watts, the MB-10C sells for less tian S3000.


## TL-5

The ultimate line-leve preamplifier. Fully dual mono, from the separate custom silver-plated input tope switches to the tube regulated dual mono power supply (housed in a separate matching chassis), for under $\$ 2500$.


## MB-300

Powerful, dimensionai, and delicate. These are just a few words critics have chosen to describe the sound of our bestselling high powered amplifier. Producing over 300 watts per channel in tetrode mode (typically orer 400), this amplifier produces ample power and heacsoom to drive almost any loucspeaker to "virtual reality" levels. Frent panel triode sw tchable to 150 watts, ané front panel bias meter included, all for less han $\$ 6000$.

## AMPLIFIERS



## Celebrating 10 Years. Now Over 3000 Customers Strong

## Hi-Fi Farm <br> THE BEST IN HOME GROWN AUDIO.

## Recommending OCM by Belles

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## Where is

## Carnegie Hall?

[RIED sthe firstcompany to intoduce the McStane Ambiance Recovery System (a.a.rs.) in a hight quality full-rang loudspeaker. marars. will bring tre reality of a live pefformance into your home. This is not an incremental improvement; marss is a revolution in the way music is reproduced.

66 the most spatialy realistic twospeaker playbazk I've heard... almost real eneugh to touch. 9

- Peter W. Mitshell, May 1954 (vol. 17 nc .5 ) Stereophile, on the m:a.r.s. process.

For more infomation on FRIED loudspeakers, upgrades and the m.a.r.s. process, please call (800) 255-1014

## PREAMPLIFIERS

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline MANUFACTURER \& \multicolumn{4}{|l|}{} \&  \&  \&  \&  \& I \& - \& / \&  \&  \& \% \& \begin{tabular}{l}
TAGE \\
\(\vec{E}\)
B
0
\end{tabular} \& \[
{ }^{s_{2} 0_{N}}
\] \\
\hline ACCUPHASE \& \[
\begin{aligned}
\& C-290 \\
\& C-250 \\
\& A D-250
\end{aligned}
\] \& \begin{tabular}{l|l}
\(S\) \& \(M M / M C / L\) \\
\(S\) \& \(L\) \\
\& \(M M / M C\)
\end{tabular} \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \[
\begin{aligned}
\& 20-20+0 .-0.2 \\
\& 1-600+0 .-3.0
\end{aligned}
\] \& \[
\frac{9.5}{7}
\] \& \[
\begin{aligned}
\& 0.005 \\
\& 0.005
\end{aligned}
\] \& \[
\begin{aligned}
\& 1 / 0 \\
\& 1 / 0
\end{aligned}
\] \& \[
\begin{aligned}
\& 252 \\
\& 252
\end{aligned}
\] \& \[
\begin{aligned}
\& 2 \\
\& 2
\end{aligned}
\] \& \[
\begin{aligned}
\& 0 \\
\& 0
\end{aligned}
\] \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \[
\begin{aligned}
\& 20 \\
\& 2 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 94 \\
\& 88 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 80 \\
\& 85
\end{aligned}
\] \& 19,820. \& Without phono stage, \(\$ 16,495\). For model above. \\
\hline ACURUS \& \[
\begin{aligned}
\& \text { RL 11(RI) } \\
\& \text { L10 } \\
\& \text { P10 }
\end{aligned}
\] \& \begin{tabular}{l|l}
S \& L \\
\(S\) \& L \\
S \& \(\mathrm{MM} / \mathrm{MC}\)
\end{tabular} \& \& \[
\begin{aligned}
\& 20-20+0,-0.1 \\
\& 20-20+0 .-0.15 \\
\& 20-20 \pm 0.3
\end{aligned}
\] \& \[
\begin{aligned}
\& 8 \\
\& 8 \\
\& 8 \\
\& 8
\end{aligned}
\] \& \[
\begin{aligned}
\& 0.05 \\
\& 0.06 \\
\& 0.06
\end{aligned}
\] \& \& \[
\begin{aligned}
\& 60 \\
\& 60
\end{aligned}
\] \& \& \& \& 2.4 \& 80 \& \& \[
\begin{aligned}
\& 795.00 \\
\& \\
\& 595.00 \\
\& 395.00
\end{aligned}
\] \& Discrete Class A; laser-trimmed volume and balance controls. As above. Discrete Class A; selectable gain and loading. \\
\hline ADCOM \& GFP-565
GFP-555II
GTP-550(RI)
GTP-600(RI)
GTP-450(RI)
GTP-350
GFB-800(RI) \& \begin{tabular}{l|l} 
S \& \(M M / L\) \\
\(S\) \& \(M M / L\) \\
\(S\) \& \(L\) \\
\& \\
\(S\) \& \(L\) \\
\(S\) \& \(L\) \\
\(S\) \& \(L\) \\
\(S\) \& \(M M / L\)
\end{tabular} \& \[
\begin{array}{|l}
\text { No } \\
\text { No } \\
\text { No } \\
\text { No } \\
\text { No } \\
\text { No }
\end{array}
\] \& \[
\begin{aligned}
\& 10-50 \pm 0.2 \\
\& 10-50 \pm 0.3 \\
\& 20-20+0,-0.5 \\
\& \\
\& 20-20+0,-0.5 \\
\& 10-50 \pm 0.5 \\
\& 10-40 \pm 0.5 \\
\& 10-50 \pm 0.5
\end{aligned}
\] \& 10
10
10
10
8
8
7.5 \& 0.003
0.005
0.005

0.009
0.009
0.009
0.03 \& \& 52
52
+53
153
256
256

76 \& $$
\begin{array}{|l|}
\hline 3 \\
3 \\
4 \\
\\
\\
4 \\
3 \\
1 \\
2
\end{array}
$$ \& \[

$$
\begin{array}{|l}
\hline 2 \\
2 \\
2 \\
\\
2 \\
2 \\
2 \\
2 \\
0
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No } \\
& \text { No } \\
& \\
& \text { No } \\
& \text { No } \\
& \text { No } \\
& \text { No }
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.55 \\
& 0.55 \\
& \\
& \\
& 0.68
\end{aligned}
$$

\] \& | 90 85 |
| :--- |
| 81 | \& \& \[

$$
\begin{array}{r}
\hline 850.00 \\
500.00 \\
800.00 \\
\\
1000.00 \\
480.00 \\
350.00 \\
800.00
\end{array}
$$

\] \& | Tuner/preamp/surround (see also "Tuners" and "Surround Processors"). |
| :--- |
| As above; video switching. Tuner/preamp (see also "Tuners"). As above. |
| Five-room, multi-source switcher. | <br>

\hline AD/S/ \& SC6(R0) \& S \& No \& $20-20 \pm 0.5$ \& 5 \& 0.01 \& \& 250 \& 6 \& 2 \& No \& \& \& \& 2899.00 \& Six-room, eight-source controller; for use with CP6 keypad control panels <br>

\hline AIR TIGHT \& \[
$$
\begin{aligned}
& \hline \text { ATC-1 } \\
& \text { ATC-2 } \\
& \text { ATL-10A }
\end{aligned}
$$

\] \& |  |  |
| :--- | :--- |
| $T$ | $M M / L$ |
| $T$ | $L$ |
| $\mathbf{P}$ | $L$ | \& \[

$$
\begin{array}{|l|}
\hline \mathrm{NO}_{0} \\
\mathrm{No} \\
\mathrm{No} \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{array}{|l}
5-100 \pm 0.01 \\
5-100 \pm 0.01
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 15 \\
& 15
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.02 \\
& 0.01
\end{aligned}
$$

\] \& \& \[

$$
\begin{aligned}
& 150 \\
& 110
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 2 \\
& 2 \\
& 1
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0 \\
& 0 \\
& 0
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No } \\
& \text { No }
\end{aligned}
$$

\] \& 180 \& 85 \& \& \[

$$
\begin{aligned}
& 3400.00 \\
& 5350.00 \\
& 1995.00
\end{aligned}
$$
\] \& <br>

\hline AMC \& CVT1030
CVT1100(RI)
AV81(RI)
AV81HT(RI)

AV81THX(RI) \& | $T$ | $M M / M C / L$ |
| :--- | :--- |
| $H$ | $M M / L$ |
| $S$ | $L$ |
| $S$ | $L$ |
| $S$ | $L$ | \& \[

$$
\begin{array}{|c|}
\hline \text { Opt. } \\
\text { No } \\
\text { No } \\
\text { No } \\
\text { No } \\
\text { No }
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 4-80+0,-3 \\
& 20-20+0,-0.5 \\
& 20-20+0,-0.5 \\
& 20-20+0,-0.5 \\
& 20-20+0,-0.5
\end{aligned}
$$
\] \& 20

30
8.5
8.5

8.5 \& $$
\begin{aligned}
& 0.03 \\
& 1 \\
& 0.02 \\
& 0.02 \\
& 0.02
\end{aligned}
$$ \& \& \[

$$
\begin{aligned}
& 150 \\
& 150 \\
& 150 \\
& 150 \\
& 150
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \hline 1 \\
& 2 \\
& 2 \\
& 4 \\
& 4 \\
& 4
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l}
\hline 2 \\
2 \\
2 \\
2 \\
2 \\
2
\end{array}
$$

\] \& | No |
| :--- |
| No |
| No |
| No | \& \[

$$
\begin{aligned}
& 2.3 \\
& 1.3
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 79 \\
& 79
\end{aligned}
$$

\] \& \& \[

$$
\begin{aligned}
& \hline 599.95 \\
& \\
& 499.95 \\
& 749.95 \\
& 999.95
\end{aligned}
$$

\] \& | Optional tube sockets and balanced out. |
| :--- |
| AV switching. As above; Dolby Pro Logic. As above; THX certified; electronic crossover. | <br>

\hline AMERICAN
HYBRID

TECHNOLOGY \& AHT/P AHT/P Nonsignature $\mathrm{AHT} / \mathrm{H}$ \& \begin{tabular}{l|l}
\hline S \& MM/MC <br>
S \& MM/MC <br>
S \& L

\end{tabular} \& \& \[

$$
\begin{aligned}
& 1-50 \pm 0.1 \\
& 1-60 \pm 0.05 \\
& 1-1 \mathrm{M} \pm 1
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 15 \\
& 20
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& .0015 \\
& .0015 \\
& .0015
\end{aligned}
$$

\] \& \& \& 1 \& 0 \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No } \\
& \text { No }
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \text { Sel. } \\
& \text { Sel }
\end{aligned}
$$

\] \& \& \[

$$
\begin{array}{|l|}
\hline 98 \\
98
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 2500.00 \\
& 5500.00 \\
& 3300.00
\end{aligned}
$$

\] \& | External power supply, d.c. coupled External power supply. |
| :--- |
| As above; optional balanced out; d.c. coupled. | <br>

\hline ANOOYNE GROUP \& ALS-1 Linestage \&  \& $$
\begin{aligned}
& \text { No } \\
& \text { No }
\end{aligned}
$$ \& 10-50+0.1-0.5 \& \[

$$
\begin{aligned}
& 20 \\
& 40
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.07 \\
& 0.03 \\
& \hline
\end{aligned}
$$

\] \& 0 \& \[

$$
\begin{aligned}
& 200 \\
& 100
\end{aligned}
$$

\] \& \& \& \[

$$
\begin{aligned}
& \text { Yes } \\
& \text { Sel }
\end{aligned}
$$

\] \& \& \& \& \[

$$
\begin{array}{r}
999.00 \\
1900.00
\end{array}
$$
\] \& <br>

\hline AR \& Limited Preamp 2 \& S \& No \& $1-200 \pm 0.5$ \& 20 \& 0.002 \& 1/0 \& 140 \& 0 \& 0 \& Sel. \& \& \& \& 2200.00 \& <br>
\hline ARAGON \& Aurum

$$
18 \mathrm{~K}
$$

\[
47 \mathrm{~K}

\] \& | $S$ | $L$ |
| :--- | :--- |
| $S$ | $L$ |
| $S$ | $M M / M C$ | \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No }
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 20-20+0 .-0.1 \\
& 20-20+0 .-0.1 \\
& 20-20 \pm 0.3
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 16 \\
& 8 \\
& 8
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.03 \\
& 0.04
\end{aligned}
$$

\] \& 0 \& \[

$$
\begin{aligned}
& 75 \\
& 65
\end{aligned}
$$

\] \& | $2$ |
| :--- |
| 2 | \& \[

0

\] \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No } \\
& \text { No }
\end{aligned}
$$

\] \& 2.4 \& 86 \& \& \[

$$
\begin{array}{r}
1750.00 \\
995.00 \\
595.00
\end{array}
$$

\] \& | Discrete Class A: includes external power supply; direct-coupled. As above. |
| :--- |
| Discrete Class A; selectable gain and loading; includes external power supply; optional high-storage supply, \$250.00. | <br>

\hline ARCAM \& Delta 110 \& S MMMC/L \& Yes \& 20-20 $\pm 0.5$ \& 8 \& 0.01 \& No \& 100 \& 2 \& 0 \& No \& \& \& 75 \& 1500.00 \& Without D/A conversion, Delta 110S, $\$ 1100.00$. <br>
\hline YAKOV ARONOV
AUDIO

LABORATORY \& \[
$$
\begin{array}{|l|}
\hline P Y-100 \\
\text { PY-200 }
\end{array}
$$

\] \& | $T$ | $M M / M C / L$ |
| :--- | :--- |
| $T$ | $L$ | \& \& \[

$$
\begin{array}{|l|l|}
\hline 10-100 \\
10-100
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 4.2 \\
& 4.2
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.25 \\
& 0.25
\end{aligned}
$$

\] \& \& \[

$$
\begin{aligned}
& 250 \\
& 250
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 2 \\
& 2 \\
& \hline
\end{aligned}
$$

\] \& \& \& \& \& \& \[

$$
\begin{array}{|l|}
\hline 2850.00 \\
2000.00 \\
\hline
\end{array}
$$
\] \& <br>

\hline ART AUDIO \& Art Audio \& MM/L \& No \& 10-50 $\pm 0.5$ \& 10 \& 0.05 \& \& 180 \& 2 \& 0 \& No \& \& 82 \& \& 1495.00 \& Active/passive switch. <br>

\hline ATMA-SPHERE MUSIC SYSTEMS \& \[
$$
\begin{aligned}
& \text { MP-1 } \\
& \text { MLS-1 } \\
& \mathrm{P}-2 \\
& \mathrm{MP}-2
\end{aligned}
$$

\] \& | $T$ | $M M / M C / L$ |
| :--- | :--- |
|  |  |
| $T$ | $L$ |
| $T$ | $M M / M C / L$ |
| $T$ | $M M / M C / L$ | \& \[

$$
\begin{array}{|c|}
\hline \text { No } \\
\text { No } \\
\text { No } \\
\text { No } \\
\text { No }
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 1-400 \pm 0.5 \\
& 1-400 \pm 0.5 \\
& 2-80 \\
& 1-400
\end{aligned}
$$
\] \& $18 \dagger$

$18 \dagger$
$18 \dagger$
$25 \dagger$ \& \& $1 / 0$
$1 / 0$
$1 / 0$
$1 / 0$ \& 200
200
100

200 \& \[
{ }^{2}

\] \& | 0 |
| :--- |
| 0 0 |
| 0 | \& | Sel. |
| :--- |
| Sel. |
| Sel. |
| Sei. | \& 0.12

0.12
0.09 \& 90
87
95 \& 72
69

75 \& \[
$$
\begin{aligned}
& 6800.00 \\
& \\
& 3800.00 \\
& 2990.00 \\
& \\
& 14,200
\end{aligned}
$$

\] \& | †Into 600 ohms External power supply; internally balanced: no negative feedback stepped volume control; custom options available. |
| :--- |
| As above but internal power supply. Internally balanced; no negative feedback; stepped volume control; custom options available. As above; external power supply; multiple paralleled tubes. | <br>


\hline AUDIBLE ILLUSIONS \& | Modulus 3A |
| :--- |
| Modulus L1 |
| Modulus 4P | \& | $T$ | $M M / L$ |
| :--- | :--- |
| $H$ | $L$ |
| $H$ | $M C$ |
| $S$ |  | \& | Opt |
| :--- |
| Opt. | \& \[

$$
\begin{aligned}
& 5-100 \pm 1 \\
& 5-100 \pm 1 \\
& 5 \cdot 100 \pm 3 \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 80 \\
& 80 \\
& 40 \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.15 \\
& 0.15 \\
& 0.02
\end{aligned}
$$

\] \& \& \[

$$
\begin{aligned}
& 50 \\
& 50
\end{aligned}
$$

\] \& | $1$ |
| :--- |
| 1 | \& \& | Yes |
| :--- |
| Yes |
| No | \& 1.00 \& 75 \& 85 \& \[

$$
\begin{aligned}
& 1795.00 \\
& 1295.00 \\
& 1995.00
\end{aligned}
$$

\] \& | External power supply; optional MC input. |
| :--- |
| External power supply. |
| As above; variable MC loading. | <br>

\hline AUDIOACCESS \& $$
\mathrm{PX}-6(\mathrm{RO})
$$

PX-600(RO) \&  \& No \& $$
10-25 \pm 0.1
$$

$$
20-25 \pm 0.5
$$ \& \[

6
\]

$$
3.5
$$ \& \[

0.002
\]

\[
0.05

\] \& | No |
| :--- |
| No | \& \& 1

0 \& 2 \& No \& \& \& \& 1100.00 \& Preamp/controller; expandable to multi-source, multi-zone use; requires infrared or hard-wired source-controller interface; optional wall-mounted keypads and speakerrelay module: without front-panel controls, PX-6S, $\$ 1000.00$. Six-zone preamp/controller; optional wall-mounted keypads. <br>

\hline \[
$$
\begin{aligned}
& \text { AUDIO } \\
& \text { ADVANCEMENTS } \\
& \hline
\end{aligned}
$$

\] \& PreMax \& | $\top$ | $L$ |
| :--- | :--- | \& \& $2-100+0.3$ \& 15 \& 0.01 \& \& Var. \& 1 \& 0 \& No \& \& \& \& 2950.00 \& Optional plug-in MM phono stage, $\$ 650.00$. <br>

\hline AUOIO ALCHEMY \& \[
$$
\begin{aligned}
& \mathrm{DLC}(\mathrm{R} \mid) \\
& \text { VAC-in-the-Box }
\end{aligned}
$$

\] \& | S | L |
| :--- | :--- |
| S | MMMC | \& No \& \[

$$
\begin{aligned}
& 20-150 \pm 0.1 \\
& 20-20 \pm 0.1
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 2.9 \\
& 2.5
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline 0.001 \\
0.01
\end{array}
$$

\] \& \& \& ${ }^{0}$ \& 0 \& No \& \& 86 \& 74 \& 459.00 299.00 \& | Digitally controlled; external power supply. |
| :--- |
| External power supply; selectable phono gain, input resistance, and capacitance. | <br>

\hline \[
$$
\begin{aligned}
& \text { AUDIO BY } \\
& \text { VAN ALSTINE }
\end{aligned}
$$

\] \& תmega II Super Pas $3 i$ Super Pas 4i FET Valve \& |  |  |
| :--- | :--- |
| S | $M M / L$ |
| $H$ | $M M / L$ |
| $H$ | $M M / L$ |
| $H$ |  | \& \[

$$
\begin{array}{|l}
\hline \text { No } \\
\text { No } \\
\text { No } \\
\text { No }
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 12-40 \pm 0.2 \\
& 10-40 \pm 0.2 \\
& 10-40 \pm 0.2 \\
& 10-40 \pm 0.1
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 12 \\
& 10 \\
& 11 \\
& 15
\end{aligned}
$$
\] \& 0.004

0.004
0.003

0.001 \& \& $$
\begin{aligned}
& 50 \\
& 50 \\
& 50 \\
& 50 \\
& \hline
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& \hline 2 \\
& 2 \\
& 2 \\
& 3 \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0 \\
& 0 \\
& 0 \\
& 2 \\
& 2
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline \text { No } \\
\text { No } \\
\text { No } \\
\text { No }
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 0.7 \\
& 0.6 \\
& 0.6 \\
& 0.7
\end{aligned}
$$

\] \& | 78 |
| :--- |
| 74 |
| 74 |
| 82 | \& \& \[

$$
\begin{array}{r}
445.00 \\
695.00 \\
795.00 \\
1195.00
\end{array}
$$

\] \& | With baianced outputs, $\$ 520.00$. |
| :--- |
| Kit, \$495.00. |
| Kit, $\$ 595.00$. | <br>

\hline
\end{tabular}

- H E
AR AGON
C O
L L E T 1.0 N


## aragon aurum. worth its wait in gold

Pure Discrete Class A<br>Penny \& Giles Volume Control<br>Epoxy Sealed Resistors

External Power Supply
Complementary Circuł Design
Balanced \& Unbalanced


Aragon's new Aurum preamplifier is currenily back ordered. Why? Because if you want a preamplifier with the qualities listed above you must spend over $\$ 6,000$. The Aurum is only $\$ 1750$. So alihough you may wait for your Aurum, you can purchase over half a pound of gold with the money you've saved,

- Also available in black


## The Cat Has Met Its Match.



The Convergent Audio Technology (CAT) SL. Signature preamplifier has been acclaimed by audio purists and music lovers around the world as the finest preamplifier available. In fact, the SL1 Signature set such a high standard, it created a problem. It was very difficult to find a worthy amplifier to mate with it. But now we're happy to report that problem has been solved. The new JL1 triode monoblock by designer Ken Stevens is the amplifier CAT lovers have beer waiting for! It exhibits the type of innovative thinking and fanatical attention to detail for which CAT is famous. Years of research, testing and listening have produced a power amplifier of incomparable performance. Match it with the SL1 Signature for a truly singular musical experience. Available for audition at selected audio dealers worldwide.

## Convergent AudioTechnology

## PREAMPLIFIERS



## PREAMPLIFIERS



## All tube. All affordable. All yours.

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


# 'Tis a gift to be simple...and musical! 



The secret? A simple, purist approach to vacuum-tube circuit design while eliminating seldom-used features. Thus the LS7 uses four 6922 dual triodes in a single-ended gain stage, with 12 dB of overall gain, and a regulated power supply; control functions include on/off, mute, gain adjustment and input selection. Component integrity and quality of construction are equivalent to the best in the industry. Five singleended input sources are accommodated, with one set of single-ended main outputs and one set of fixed-level tape outputs.
The VT60, meanwhile, delivers a solid 50 watts per channel from two matched pair of 6550 output tubes, with rugged 6922 triodes used for the input stage and drivers. A well-regulated power supply rated at 184 joules of energy storage gives the VT60 surprising dynamics and bass response into 4,8 or 16 -ohm speaker loads. Inputs are single-ended. And, the compact dimensions of the VT60 put it right at home on a shelf or in a cabinet. Individually, the LS7 and VT60 are capable of startling levels of musical resolution; used together, they comprise a system wondrously capable of conveying musical truth and coherence. They will easily keep pace as you improve other components of your audio system-input sources, loudspeakers, wire. In fact, you will likely never outgrow their capabilities. And you'll certainly never regret their affordable price.

## LS7 SPECIFICATIONS

FREQUENCY RESPONSE: $\pm .5 \mathrm{~dB}, 1.0 \mathrm{~Hz}$ to $100 \mathrm{kHz}-3 \mathrm{~dB}$ points below 0.1 Hz and atove 300 kHz .
DISTORTION: Less than . $01 \%$ at 2 V RMS output. (Typically . $005 \%$ in midband)
GAIN: Main Output - 13dB unbalanced.
Tape output - OdB.
INPUT IMPEDANCE: 100 K ohms. Inputs (5): tape, tuner, CD, video, aux.
OUTPUT IMPEDANCE: 200 ohms main output. Recommended load 60 K ohms and 100 pF \{ 20 K ohms minimum and 1000 pF maximum).
MAXIMUM INPUT: 20 V maximum.
RATED OUTPUTS: 2 V RMS 1 Hz to 100 kHz , all outputs, $60 \mathrm{~K} \mathrm{ohm} \mathrm{load} \mathrm{(maximum} \mathrm{output} 25 \mathrm{~V}$ RMS at $1 / 2 \%$ THD at 1 kHz into 100 K ohms.)
CONTROLS: Gain, input selector. Toggle switches: power/off, mute/operate.
POWER SUPPLIES: Electronically-regulated Iow and high voltage supplies. Line regulation better than .01\%.
NOISE: 15 UV RMS maximum IHF weighted noise at main output with gain control minimum (more than 102dB below 2V RMS output).
TUBE COMPLEMENT: (4)-6922/E88cc dual triode. Solid-state power supply.
POWER REQUIREMENTS: $100-135 \mathrm{VAC} 50 \mathrm{~Hz}$ (200-270VAC $50 / 60 \mathrm{~Hz}$ ) 25 watts maximum.
DIMENSIONS: $19^{\prime \prime}(48 \mathrm{~cm}) \mathrm{W} \times 51 / 4^{\prime \prime}(13.4 \mathrm{~cm}) \mathrm{H}$ (standard rack panel) $\times 10^{1 / 4^{*}}(26 \mathrm{~cm}$ ) D Handles extend $1^{1 / 2 "}(3.8 \mathrm{~cm})$ forward of front panel. Rear chassis fittings extend $1 / 2^{\prime \prime}(1.3 \mathrm{~cm})$.
WEIGHT: $9.8 \mathrm{lbs} .(4.5 \mathrm{~kg})$ Net; $18.8 \mathrm{lbs} .(8.5 \mathrm{~kg})$ Shipping.
Specifications subject to change without notice.
© 1994 Audio Research Corporation.

## VT60 SPECIFICATIONS

POWER OUTPUT: 50 watts per channel continuous from 20 Hz to 20 kHz . 1 kHz total harmonic distortion typically $1 \%$ at 50 watts, below $.05 \%$ at 1 watt.
Approximate actual power available at "clipping" 52 watts ( tkHz ). (Note that actual power output is dependent upon both line voltage and "condition" i.e.: if power line has high distortion, maximum power will be affected adversely, although from a listening standpoint this is not very critical.)
POWER BANDWIDTH: (-3dB Points) 15 Hz to 40 kHz .
FREQUENCY RESPONSE: (-3dB Points at 1 watt) 3 Hz to 40 kHz .
INPUT SENSITIVITY: 1.05 V RMS for rated output.
INPUT IMPEDANCE: 100K ohms unbalanced.
OUTPUT REGULATION: Approximately 0.6 dB 16 ohm load to open circuit (Damping factor approximately 14 ).
OVERALL NEGATIVE FEEDBACK: 19dB.
SLEW RATE: 7 volts/microsecond.
RISE TIME: 10 microseconds.
HUM \& NOISE: Less than 0.5 mV RMS -95 dB below rated output (IHF weighted, input shorted).
POWER SUPPLY ENERGY STORAGE: Approximately, 184 joules.
POWER REQUIREMENTS: 105-125VAC 60 Hz (210-250VAC 50 Hz ) 265 watts at rated output, 300 watts maximum, 175 watts at "idle"
TUBES REQUIRED: 2 - Matched pair 6550B Power Output; 2-6922 Driver; 1-6922 input.
DIMENSIONS: 14 " $(35.6 \mathrm{~cm}) \mathrm{W} \times \mathbf{7 " ~}^{(17.8 \mathrm{~cm}) \mathrm{H} \times}$ $13.3^{\prime \prime}(33.8 \mathrm{~cm})$ D. Output connectors extend $1 "$ $(2.5 \mathrm{~cm})$ to the rear.
WEIGHT: 32.7 lbs . $(14.9 \mathrm{~kg})$ Net; $48 \mathrm{lbs} .(21.8 \mathrm{~kg})$ Shipping.

## Three Year Limited Warranty

These Audio Research products are backed by a 3 year Limited Warranty: Vacuum tubes are warranted against defects for 90 days. For one year from date of purchase. Audio Research pays round-trip freight charges on any equipment requiring warranty services at the factory. See your authorized Audio Research dealer for details.

## PREAMPLIFIERS



## PREAMPLIFIERS




## Carver separates. The essence of total control.

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

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

R-e-l-a-x.
Now you can obtain a powerful home theater command center, combining the musical brilliance of separates with the ease of a receiver, all in one versatile package: Carver's CT-27v Dolby Pro Logic ${ }^{\text {M }}$ A/V Preamplifier/Tuner.

The CT-27v pairs flawless sound with exceptional Dolby processing, including a generous selection of DSP effects (wait "til you experience an old movie like Casablanca on our "Matrix"
mode), yet without the extraneous gimmicks that undermine aural integrity.

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

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

## PREAMPLIFIERS




## PREAMPLIFIERS

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline MANUFACTURER \& \multicolumn{5}{|l|}{} \&  \&  \&  \&  \&  \&  \&  \&  \& \& AGE \& \[
{ }^{s_{17} 1 O_{N}}
\] \\
\hline MORRISON AUDIO \& PRE-3 \& S \& MM/MC/L \& No \& 0.2-400 +0,-3 \& 10 \& 0.005 \& \& Var. \& 10 \& No \& Var. \& \& \& 2400.00 \& External power supply; dual outputs. \\
\hline MTX SOUNDCRAFTSMEN \& P-100 \& S \& MM/L \& No \& \(20.20 \pm 0.5\) \& 8 \& 0.008 \& \& 150 \& 2 \& No \& 2.5 \& 100 \& \& 399.95 \& \[
\begin{aligned}
\& \text { With rack mount, P-100PR0, } \\
\& \$ 499.95 \text {. }
\end{aligned}
\] \\
\hline MUSEATEX
AUDIO \& AVC-1(Ri) \& S \& L \& No \& 1-100 +0, -0.25 \& 3 \& 0.25 \& 1/0 \& 88 \& 0 \& No \& \& \& \& 1999.00 \& -Two audio and two AV tape loops. \\
\hline \begin{tabular}{l}
MUSE \\
ELECTRONICS
\end{tabular} \& \begin{tabular}{|l} 
One \\
Three(RI)
\end{tabular} \& \& \begin{tabular}{l}
MM/MC/L \\
L
\end{tabular} \& \& \[
\begin{aligned}
\& 7 \cdot 1.25 \mathrm{M} \\
\& 7-1.25 \mathrm{M}
\end{aligned}
\] \& \[
5
\] \& \[
\begin{aligned}
\& 0.02 \\
\& 0.02 \\
\& \hline
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline 0 \\
1 / 0 \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& 50 \\
\& 50 \\
\& \hline
\end{aligned}
\] \& \begin{tabular}{l|l}
1 \& 0 \\
1 \& 0
\end{tabular} \& \begin{tabular}{l}
Sel. \\
Sei
\end{tabular} \& Adj. \& 88 \& 68 \& \[
\begin{array}{|}
2500.00 \\
1700.00 \\
\hline
\end{array}
\] \& Line stage switchable to passive operation; external power supply. \\
\hline MUSICAL DESIGN \& \begin{tabular}{l} 
SP-2 \\
Phono one \\
\hline PM1/2 MKII
\end{tabular} \& S \& \begin{tabular}{l}
L \\
MM
\end{tabular} \& No \& \[
\begin{aligned}
\& 0.1-180 \\
\& 20-20 \pm 0.2
\end{aligned}
\] \& \[
\begin{aligned}
\& 60 \\
\& 10 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 0.01 \\
\& 0.01 \\
\& \hline
\end{aligned}
\] \& \& 100 \& 0 \& \[
\begin{aligned}
\& \text { Yes } \\
\& \text { No }
\end{aligned}
\] \& 5 \& 80 \& \& \[
\begin{aligned}
\& 995.00 \\
\& 595.00 \\
\& \hline
\end{aligned}
\] \& Direct input bypasses switching; stepped balance control. Selectable MM phono gain. \\
\hline MUSIC REFERENCE \& RM1/2 MKII
RM-4C
RM-4+
RM-5 MKIII \& \[
\begin{aligned}
\& \mathrm{T} \\
\& \mathrm{~T} \\
\& \mathrm{I} \\
\& \mathrm{~T}
\end{aligned}
\] \& \[
\begin{aligned}
\& \hline \mathrm{MM} / \mathrm{MC} / \mathrm{L} \\
\& \mathrm{MC} \\
\& \mathrm{MM} \\
\& \mathrm{MM} / \mathrm{L}
\end{aligned}
\] \& No \& \[
\begin{aligned}
\& 1-100 \pm 0.5 \\
\& 10-100 \\
\& 2-200+0 .-1 \\
\& 1-100
\end{aligned}
\] \& \[
\begin{aligned}
\& 10 \\
\& 20 \\
\& 40
\end{aligned}
\] \& \[
\begin{aligned}
\& 0.02 \\
\& 0.01 \\
\& 0.01 \\
\& 0.15
\end{aligned}
\] \& No \& \& 2 \& \begin{tabular}{l} 
Sel. \\
Sel \\
No \\
Yes \\
Yes \\
\hline
\end{tabular} \& 0.25 \& 87 \& 90 \& \[
\begin{array}{r}
4000.00 \\
750.00 \\
950.00 \\
1250.00
\end{array}
\] \& \begin{tabular}{l}
External power supply. \\
Adjustable gain and impedance: No cabinet; oak cabinet, \$175.00; rosewood cabinet, \(\$ 250.00\).
\end{tabular} \\
\hline MUSIC \& SOUND \& \[
\begin{aligned}
\& D L S-1(\mathrm{R})) \\
\& A C C-1(\mathrm{R})
\end{aligned}
\] \& S/P \& L \& \(\dagger\)
Yes \& \[
1-200
\] \& \[
\begin{aligned}
\& 10 \\
\& 10 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& .0008 \\
\& .0008
\end{aligned}
\] \& \[
\begin{aligned}
\& 0 \\
\& 0 \\
\& \hline
\end{aligned}
\] \& \& \begin{tabular}{l|l}
2 \& 0 \\
2 \& 0
\end{tabular} \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No }
\end{aligned}
\] \& \& \& \& \[
\begin{aligned}
\& 1195.00 \\
\& 895.00
\end{aligned}
\] \& \(\dagger 18\)-bit, eight-times oversampling D/A converter. Seven high-level and three digital inputs; video switching; external power supply. \\
\hline NAD \& \[
\begin{array}{|l|}
\hline 106 \\
1000 \\
1600(\mathrm{RI}) \\
\hline
\end{array}
\] \& \[
\begin{array}{|l|}
\hline \mathrm{S} \\
\mathrm{~S} \\
\mathrm{~S} \\
\hline
\end{array}
\] \& MM/MC/L MM/MC/L MM/MC/L \& \begin{tabular}{|l} 
No \\
NO \\
No \\
No
\end{tabular} \& \[
\begin{aligned}
\& 20-20 \pm 0.2 \\
\& 20-20 \pm 0.2 \\
\& 20-20 \pm 0.2
\end{aligned}
\] \& \[
\begin{aligned}
\& 12 \\
\& 12 \\
\& 10 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 0.02 \\
\& 0.04 \\
\& 0.04
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline 0 \\
\text { No } \\
\text { No } \\
\hline
\end{array}
\] \& \[
\begin{array}{|l}
80 \\
80 \\
80 \\
\hline
\end{array}
\] \& \begin{tabular}{|l|l|}
\hline 2 \& 2 \\
2 \& 2 \\
2 \& 2 \\
\hline
\end{tabular} \& \[
\begin{aligned}
\& \text { No } \\
\& \text { No } \\
\& \text { NO }
\end{aligned}
\] \& \[
\begin{aligned}
\& 1.5 \\
\& 1.5 \\
\& 1.3
\end{aligned}
\] \& \[
\begin{aligned}
\& 76 \\
\& 76 \\
\& 75 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 76 \\
\& 76 \\
\& 75
\end{aligned}
\] \& \[
\begin{aligned}
\& 599.00 \\
\& 349.00 \\
\& 449.00 \\
\& \hline
\end{aligned}
\] \& Includes headphone amp. Iuner/preamp (see also "Tuners"). \\
\hline NAIM AUDIO \& \begin{tabular}{l}
NAC 92 \\
NAC 72 \\
NAC 82(RI) \\
NAC 52(R1)
\end{tabular} \& S \& \begin{tabular}{l}
L \\
L \\
L \\
MM or MC/ \\
L
\end{tabular} \& No
No
No

No \& \[
$$
\begin{aligned}
& 20-20 \pm 0.5 \\
& 20-20 \pm 0.5 \\
& 20-20 \pm 0.5 \\
& 20-20 \pm 0.5
\end{aligned}
$$

\] \& | $7.5$ |
| :--- |
| 7.5 |
| 7.5 $7.5$ | \& \& \& 75

75
75

75 \& | 2 | 0 |
| :--- | :--- |
| 2 | 0 |
| 3 | 0 |
| 3 | 0 | \& No

No
No

No \& 2.5 \& \& \& \[
$$
\begin{array}{|c|}
\hline 965.00 \\
\\
1325.00 \\
3995.00 \\
\\
9995.00 \\
\hline
\end{array}
$$

\] \& | Requires external power supply; optional Hi-Cap supply, $\$ 1235.00$ : optional MM or MC phono boards, $\$ 155.00$ per pair ( $2.5-\mathrm{mV}$ MM phono sensitivity) |
| :--- |
| As above but $\$ 115.00$ per pair for phono boards |
| Requires external power supply; optional one or two Hi-Cap supplies, $\$ 1235.00$ each; optional MM/MC phono boards, $\$ 155.00$ per pair ( $2.5-\mathrm{mV}$ MM sensitivity). Includes separate power supply, user-configurable inputs. | <br>

\hline NAKAMICHI \& $$
\begin{aligned}
& \text { CA7A(RI) } \\
& \text { CA5AII } \\
& \hline
\end{aligned}
$$ \& S \& MM/MC/L MM/MC/L \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No }
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 1-100+0,-3 \\
& 1-100+0,-3
\end{aligned}
$$

\] \& \[

7

\] \& \[

$$
\begin{aligned}
& 0.002 \\
& 0.002
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No }
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 150 \\
& 150
\end{aligned}
$$

\] \& | 2 | 3 |
| :--- | :--- |
| 2 | 2 | \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No }
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \hline 0.625 \\
& 0.63 \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 88 \\
& 88
\end{aligned}
$$
\] \& 87

81 \& $$
\begin{aligned}
& 2950.00 \\
& 1250.00
\end{aligned}
$$ \& Full system remote for Nakamichi units. <br>

\hline N.E.W. \& $$
\begin{aligned}
& p-1 \\
& p-2
\end{aligned}
$$ \& S/P \& \[

$$
\begin{aligned}
& L \\
& L
\end{aligned}
$$

\] \& \& \& \& \& 110 \& \& | 1 | 0 |
| :--- | :--- | :--- |
| 2 | 0 | \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No } \\
& \hline
\end{aligned}
$$

\] \& \& \& \& \[

$$
\begin{aligned}
& 598.00 \\
& 998.00
\end{aligned}
$$
\] \& External power supply, Ciass A. <br>

\hline NILES AUDIO \& Component
Commander
(RO) \& S \& L \& No \& $5-50+0 .-3$ \& 7 \& 0.002 \& \& 50 \& 2 l \& No \& \& \& \& \& Multi-zone, multi-source switching system; modular mainframe with external power supply; optional keypad or handheld remote. <br>
\hline NOBIS TECHNOLOGIES \& Proteus \& T \& MM/L \& No \& 10-35 $\pm 1$ \& 12 \& 0.01 \& \& 65 \& 10 \& Sel. \& \& 72 \& \& 2045.00 \& Without phono card, \$1695.00. <br>

\hline NUMARK \& | DM2175XLS |
| :--- |
| DM2075XS |
| DM2160 |
| DM2060 |
| DM1475 |
| DM1180 |
| DM1080 |
| DM1100X | \& S

$S$
$S$
$S$
$S$
$S$
$S$
$S$

$S$ \& | MM/L |
| :--- |
| MM/L |
| MM/L |
| MM/L |
| MM/L |
| MM/L |
| MM/L |
| MM/L | \& | No |
| :--- |
| No |
| No |
| No |
| No |
| No |
| No |
| No | \& $20-20$

$20-20$
$20-20$
$20-20$
$20-20$
$20-20$
$20-20$

$20-20$ \& \& $$
\begin{aligned}
& .0005 \\
& .0005 \\
& .0005 \\
& .0005 \\
& .0005 \\
& .0085 \\
& .0085 \\
& .0086 \\
& \hline
\end{aligned}
$$ \& $1 / 0$

$1 / 0$
$1 / 0$
$1 / 0$
$1 / 0$
$1 / 0$
$1 / 0$

$1 / 0$ \& | 100 |
| :--- | :--- |
| 100 |
| 100 |
| 100 | \& | 2 | 3 |
| :--- | :--- |
| 2 | 3 |
| 2 | 3 |
| 2 | 3 |
| 1 | 2 |
| 0 | 2 |
| 0 | 2 |
| 0 | 2 | \& Sel.

Sel.
Sel.
Sel.
Sel.
Sel.
Sel.
Sel.

Sel \& \& $$
\begin{aligned}
& 77 \\
& 77 \\
& 77 \\
& 77 \\
& 75 \\
& 75 \\
& 74 \\
& 74
\end{aligned}
$$ \& \& \[

$$
\begin{array}{|r|}
\hline 1799.00 \\
1299.00 \\
1099.00 \\
899.00 \\
599.00 \\
449.00 \\
249.00 \\
199.00 \\
\hline
\end{array}
$$
\] \& 24-S sampling Includes six-band graphic EO. Mixer. Scratch mixer. <br>

\hline $$
\begin{aligned}
& \text { OCM } \\
& \text { TECHNOLOGY }
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& \hline 88(\mathrm{RI}) \\
& 55 \\
& 10 \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l}
\hline \mathrm{S} \\
\mathrm{~S} \\
\mathrm{~S} \\
\hline
\end{array}
$$

\] \& MM/MC \& \& \[

$$
\begin{aligned}
& 20-20 \pm 0.1 \\
& 20-20 \pm 0.1
\end{aligned}
$$

\] \& \[

9

\] \& \[

$$
\begin{array}{|l}
0.05 \\
0.05
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 10 \\
& 1 / 0
\end{aligned}
$$

\] \& \& | 2 | 0 |
| :--- | :--- |
| 1 | 0 | \& \[

$$
\begin{array}{|l|}
\hline \text { No } \\
\text { No }
\end{array}
$$

\] \& 10 \& 86 \& 72 \& \[

$$
\begin{array}{|l|}
\hline 2395.00 \\
1395.00 \\
1195.00 \\
\hline
\end{array}
$$
\] \& Class A. As above. <br>

\hline ONIX \& OA 24 \& S \& MM/MC/L \& No \& $11-35 \pm 1$ \& 1 \& 0.004 \& \& 140 \& 0 \& No \& 2.5 \& 73 \& 66 \& 795.00 \& Requires S.O.A.P. 2 power supply, $\$ 595.00$, of Onix OA 401 amp. <br>
\hline ONKYO \& P-301
integra P-304

integra $P-388 \mathrm{~F}$ \& \[
\overline{\mathrm{S}}

\] \& | MM/L |
| :--- |
| MM/MC/L MM/MC/L | \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No } \\
& \text { No }
\end{aligned}
$$
\] \& $15-3 \pm 1$

$0.8-170 \pm 3$

$0.8-150+0 .-3$ \& \[
$$
\begin{array}{|l|}
\hline 5 \\
6 \\
10
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 0.009 \\
& .0005 \\
& .0005
\end{aligned}
$$

\] \& 1/0 \& 150 \& | 3 | 3 |
| :--- | :--- |
| 2 | 2 |
| 2 | 0 | \& No

No

No \& $$
\begin{aligned}
& 2.5 \\
& 2.5 \\
& 1.25
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& 83 \\
& 92 \\
& 92
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 81 \\
& 81
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|r|}
\hline 290.00 \\
560.00 \\
1250.00
\end{array}
$$

\] \& | Multi-room capability if used with M-501 amp. |
| :--- |
| Dual record-output selectors. Motorized input selector and volume contral. | <br>

\hline ORITRON \& $$
\begin{aligned}
& \mathrm{HF}-\mathrm{C} 4 \\
& \mathrm{C}-2 \mathrm{R}(\mathrm{RI}) \\
& \hline
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& \mathrm{S} \\
& \mathrm{~S}
\end{aligned}
$$

\] \& LMM/MC/L \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No }
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 20-20 \pm 0.2 \\
& 5-20 \pm 0.3
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l}
8 \\
8
\end{array}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline 0.01 \\
.0006 \\
\hline
\end{array}
$$

\] \& 1/0 \& 125 \& | 2 | 2 |
| :--- | :--- |
| 2 | 2 | \& \[

$$
\begin{array}{|l|}
\hline \text { No } \\
\text { No } \\
\hline
\end{array}
$$

\] \& \& 85 \& 75 \& \[

$$
\begin{array}{r}
599.95 \\
1195.00
\end{array}
$$
\] \& <br>

\hline PAC \& Pro-Reference
III
Pro-Reterence
IIIp
Pro-Reference
III/10k
Pro-Reterence
2000
CPRID/TIPS
CPRIIDTIPS \& T
T
T
T
S

S \& | L MM/MC MM/MC/L |
| :--- |
| L |
| LMM/L | \& \& $\left\{\begin{array}{l}10-100 \\ 10-100+0,-1 \\ 10-100 \\ 10-100 \\ 0-100+0,-0.1 \\ 0-100+0,-1\end{array}\right.$ \& \[

$$
\begin{aligned}
& 28 \\
& 14 \\
& 28 \\
& 28 \\
& 10 \\
& 10 \\
& \hline
\end{aligned}
$$

\] \& | 0.01 |
| :--- |
| 0.01 |
| 0.01 |
|  |
| 0.01 |
| 0.01 |
| 0.01 | \& \& \[

$$
\begin{aligned}
& 30 \\
& 30 \\
& 30 \\
& 30 \\
& 30 \\
& 30 \\
& \hline
\end{aligned}
$$

\] \& | 1 | 0 |
| :--- | :--- |
| 1 | 0 |
| 1 | 0 |
| 1 |  |
| 1 |  | \& No

No
No
No

No \& $$
\begin{aligned}
& 0.3 \\
& 0.3
\end{aligned}
$$ \& \& \& \[

$$
\begin{array}{|c|}
\hline 3995.00 \\
2995.00 \\
10,000 \\
2495.00 \\
3100.00 \\
3500.00
\end{array}
$$

\] \& | Includes Pro-Reference III, |
| :--- |
| Pro-Reference lif, power supply. and rack. |
| Battery power supply. As above. | <br>

\hline PARASOUND \& $$
\begin{aligned}
& \text { P/HP-850 } \\
& \text { P/LD-1100(RI) } \\
& \text { P/LD-1500 } \\
& \text { P/LD-2000(RI) }
\end{aligned}
$$ \& \[

$$
\begin{array}{|l}
\hline \mathrm{S} \\
\mathrm{~S} \\
\mathrm{~S} \\
\mathrm{~S} \\
\hline
\end{array}
$$

\] \&  \& | No |
| :--- |
| No |
| No |
| No | \& \[

$$
\begin{aligned}
& 10-100+0,-2 \\
& 5-135+0,-2 \\
& 5-135+0,-2 \\
& 5-135+0,-2 \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 10 \\
& 10.5 \\
& 10.5 \\
& 10.5
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.009 \\
& 0.005 \\
& 0.005 \\
& 0.005
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0 \\
& 1 / 0
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 150 \\
& 150 \\
& 150 \\
& 150
\end{aligned}
$$

\] \& | 1 | 2 |
| :--- | :--- |
| 2 | 0 |
| 1 | 0 |
| 1 | 0 | \& | No |
| :--- |
| Nol |
| Sel. |
| Sel. |
| Sel. | \& 2.5 \& 65 \& \& \[

$$
\begin{array}{r}
375.00 \\
795.00 \\
850.00 \\
1495.00 \\
\hline
\end{array}
$$

\] \& | inciudes headphone amp. Class A. |
| :--- |
| As above: d c. coupled. As above. | <br>

\hline $$
\begin{aligned}
& \text { PASS } \\
& \text { LABORATORIES }
\end{aligned}
$$ \& Aleph P \& S \& L \& No \& 1-100 +0,-3 \& 20 \& 0.01 \& $1 / 0$ \& \& 0 \& Sel. \& \& \& \& 3000.00 \& Single-ended Class $A_{;}$no negative feedback. <br>

\hline PERREAUX (Continued) \& $$
\begin{aligned}
& E P-3 \\
& E P-4(R I) \\
& \hline
\end{aligned}
$$ \& \[

$$
\begin{array}{|l}
\hline S \\
S \\
\hline
\end{array}
$$

\] \& MMMCL MM/MC/L \& No \& \[

$$
\begin{aligned}
& 20-50 \pm 0.3 \\
& 20-50 \pm 0.3
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 8.2 \\
& 8.2
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline 0.008 \\
0.008 \\
\hline
\end{array}
$$

\] \& \& \[

$$
\begin{aligned}
& 220 \\
& 220
\end{aligned}
$$

\] \& | 2 |  |
| :--- | :--- |
| 2 | 2 | \& \& \[

$$
\begin{aligned}
& 2.0 \\
& 2.0
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 74 \\
& 74
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 52 \\
& 52 \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{array}{r}
895.00 \\
1095.00
\end{array}
$$
\] \& <br>

\hline
\end{tabular}

## A yre

V-3
Power Amplifier


[^2]Ayre Aroustics, Inc.

## PREAMPLIFIERS



## PREAMPLIFIERS




## Rediscover Quad!

To most audiophiles, this famous company means the world's finest speaker, the ESL-63. But Quad is back in a big way, with much more. See why UHF Magazine called the model 67 CD player the finest in its class. Why competitors tried to copy our current dumping amplifiers...and failed! And how the company that practically invented hi-fi reinvented remote controlled convenience.


## PREAMPLIFIERS



## PREAMPLIFIERS




## TUNERS



#  

difference


## Bell'Oggetti International Ltd,

711 Ginesi Drive Morganville, NJ O7751-1250 Tel ( 908 ) 972-1333
Fax :908) 536-6482
BBHLOCSHMYI



# See the Difference. Hear the Difference. M Series ${ }^{*}$ Cable Technology by Monster Cable. 

The Miooo ${ }^{\circ} \mathrm{Mk}_{3}{ }^{\text {b }}$

Advanced Cable Designs for the Serious Audiophile

With so many cables on the market, it's easy to get confused. Monster's famous patented $M$ Series ${ }^{\ominus}$ cable technologies deliver the most advanced sonic cable performance available.
See for yourself.
Separate Bandwidth Balanced ${ }^{\circledR}$ multi-gauged conductors for high, low, and mid-frequencies. MicroFiber ${ }^{\circledR}$ dielectrics and Time Correct ${ }^{\circledR}$ windings for greater clarity and dynamic range. Isotec insulating jackets that isolate the conductors from outside vibration.
Combine our patented cable designs with the highest technology connector money can buy--Monster's Turbine Design ${ }^{\circledR}$ and you have a cable that's truly Monsterous.
Hear for yourself.
Deeper, tighter bass, increased dynamic range, precise imaging and greater"depth" transports you closer to the original performance.
Audition the Mrooo ${ }^{\otimes} \mathrm{Mk} 3$ and the other M Series ${ }^{\circledR}$ cables at your Monster Cable ${ }^{\oplus} \mathrm{M}$ Series dealer and let your ears be the judge.

## TUNERS



## RECEIVERS



## The Adcom the ultimate hom




INNOVATIQNSS 93
Adcom components ure critically acclaimed year after year.

Before you call a contractor or run to the home improvement store, let an Adcom home theater GTP-600 tuner/preamplifier duplicate the dramatic depths of a large listening area. The GTP-600 and an award-winning Adcom power amplifier can instantly create a custom soundstage for your favorite movies or musical events, without physically adding a square foot of space. Providing switching for up to four video sources and four audio sources, the GTP-600 gives you the flexibility to customize your audio/video system for years to come. Composite or S-video connections provide a high definition signal
path for maximum video quality. And with features like Adcom's exclusive Cinema Surround circuitry and Dolby Pro Logic ${ }^{\circledR}$ decoding, the GTP-600 brings cutting edge home theater technology to your fingertips. - Logical control groupings and preprogrammed DSP (Digital Signal Processing) modes allow easy, precise adjustments for a variety of custom-tailored, psycho-acoustically correct listening environments. The user friendly "smart" on-

## GTP-600: e improvement. <br> 

screen display keeps you fully informed and makes system balancing easy and accurate. ( These features couple ideally with the GTP-600's advanced, programmable remote which lets you command up to eight additional system components. This sophisticated combination consistently delivers sound exactly the way you want to hear it. And the details? Typically Adcom. Gold plated RCA connectors, precision $1 \%$ tolerance Roederstein metal-film resistors and high speed linear gain amplifiers are just a few of the many outstanding design elements that give the GTP-600 its exceptional audio and video quality. Now, with Adcom home theater you can build an addition to
your home that you can feel as well as see and hear. Pick up the right tools for the job at your local Adcom dealer


With the GTP-601's delay modes the rear channels move the walls back simulating the effect of a much larger areat. today. You'll realize that our state-of-the-art components hit the nail on the head every time.


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Distributed in Canada by PRO ACOUSTICS INC. Montréal. Québec (514) 341-1226 Enter No. 8 on Reader Service Card


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

## DON'T COMPROMISE SOUND FOR SURROUND.




Just as discrete components allow an audio system to be optimized for better sound, Denon's DDSC
produces more accurate, more realistic surround sound by reducing Total Harmonic Distortion, by increasing
Signal-to-Noise and minimizing DSP quantization noise.
Naturally, the Denon AVR-2500 also features the latest audio and FM circuitry,
 such as multi-zone capability for playing different programs in different parts of your home and personal memory fields for one-button recall of your favorite, custom tailored surround sound stages. The AVR-2500 and AVR-1500 also feature the RDS Smart Radio System, which lets broadcasters offer you additional, invaluable information,
services and conveniences, either on the front panel or via On-Screen Display on the AVR-2500. Denon AV Receivers: DSP surround sound, advanced features and uncompromised High Fidelity.

# A handy visual guide Home Theater Re 



# to determining which ceivers are better. 



Just as you have no problem distinguishing a film worthy of an Academy Award ${ }^{\otimes}$ from those destined to be remembered (or forgotten) for other reasons, we feel your eyes and ears will have little trouble recognizing the superior performance and functionality found in Onkyo's complete line of Home Theater Receivers.

The critics already have. Our top-ot-the-line THX model, the TX-SV919THX, was hailed by Technical Editor David Ranada in a recent issue of Stereo Review as "the best

AV receiver I have ever tested". Our TX-SV717PRO won the first ever "Hot Ticket" award from Home Theater Technology. And just as a great film can be made on a small budget, so can great Home Theater sound be had via our TX-SV414PRO

So, we urge you to visit your Onkyo dealer and choose the Home Theater Receiver model that's right for you. It'll add such a new dynamic to your home viewing, you might even want to rent one of the films shown at left. They're always in.
ONKYO

## RECEIVERS




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

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

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

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

Only Yamaha Cinema DSP creates phantom speakers that fully replicate the experience you get in multi-speaker movie theaters. It sounds so real, in fact, you'll swear you hear sounds

## Cinemá DED



## Only Yamaha Cinema DSP

 creates phantom speakers. It sounds so real, sou'll swear you hear sounds in places you don't even have speakers. in places you don't even have speakers.As you might imagine, a breakthrough like this is no small feat. It's accomplished by multiplying the effects of Digital Sound Field Processing and Dolby Pro Logic. ${ }^{\text {® }}$

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

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

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

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


## TURNTABLES



## TURNTABLES



## TONEARMS

| Manufacturer |  |  |  |  |  |  |  |  |  |  |  | Conarams |  |  | ${ }^{s_{\partial l} 0_{N}}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| AIRTANGENT |  | A/L A/L | w w | Yes Yes |  | Yes Yes |  |  | $0$ | $\begin{aligned} & 0.5-5.0 \\ & 0.5-5.0 \end{aligned}$ | $\begin{aligned} & 4-20 \\ & 4-20 \end{aligned}$ |  | $\begin{aligned} & 1 / 2 \\ & 1 / 2 \end{aligned}$ | $\begin{gathered} \hline 12.900 . \\ 7900.00 \end{gathered}$ | Remote cueing and adjustment of VTA. |
| AUDIOMECA | SL5 | L | R | Yes |  | Yes | 8 | 9.8 |  |  |  |  |  | 2850.00 |  |
| AIJDIO NOTE | $\begin{aligned} & \text { AN-0/c-A } \\ & \text { AN- } 1 / \mathrm{S}-\mathrm{V} \end{aligned}$ | $\bar{p}$ | $\begin{array}{\|l\|} \hline F \\ F \end{array}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{array}{\|l\|l} 10 \\ 10 \end{array}$ |  |  | $\begin{aligned} & 0.5-5.0 \\ & 0.5-5.0 \end{aligned}$ | $\begin{aligned} & 5-20 \\ & 5-20 \end{aligned}$ |  |  | $\begin{array}{r} 995.00 \\ 1995.00 \end{array}$ | Bimetalic self-damping armtube. |
| AUDIOQUEST | $\begin{aligned} & \text { AQ PT-6 } \\ & \text { AQ PT-7 } \\ & \text { AQ PT-8 } \end{aligned}$ | $\begin{aligned} & p \\ & p \\ & p \\ & p \end{aligned}$ | $\begin{array}{\|l\|} \hline F \\ F \\ F \end{array}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \\ & \text { Yes } \end{aligned}$ | 9 9 9 | $\begin{array}{\|l\|} \hline 12 \\ 12 \\ 12 \end{array}$ |  | $0-3$ $0-3$ $0-3$ | $\begin{aligned} & 3-12 \\ & 3-12 \\ & 3-12 \end{aligned}$ | $\begin{aligned} & 71 \\ & 71 \\ & 71 \end{aligned}$ | $\begin{aligned} & 11 / 4 \\ & 11 / 4 \\ & 11 / 4 \end{aligned}$ | $\begin{aligned} & \hline 450.00 \\ & 550.00 \\ & 650.00 \end{aligned}$ | Optional viscous damping. As above. As above. |
| AUDIO " 78 "/SME | SME 3012-R <br> SME 3009-R SME III | $\begin{aligned} & \hline P \\ & P \\ & P \end{aligned}$ | R <br> $\stackrel{R}{\mathrm{R}}$ | Yes <br> Yes <br> Yes | Yes <br> Yes Yes | Yes <br> Yes Yes | 12.16 |  |  | $\begin{aligned} & 1.25-5 \\ & \\ & 1.25-5 \\ & 2.5 \text { Max. } \end{aligned}$ | $\begin{aligned} & 1.5-26 \\ & \\ & 1.5-26 \\ & 0-12 \end{aligned}$ |  |  | $\begin{aligned} & 689.00 \\ & \\ & 649.00 \\ & 479.00 \end{aligned}$ | For LPs, 78s, 16-inch transcriptions, and hill-and-dale recordings; optional fluid damper. As above. |
| CLEARAUDIO/ SOUTHER | Souther TQ-1 <br> Tri-Quartz | 1 | R/W | Yes |  | Yes | 2 |  | 0 |  |  |  | $\dagger$ | 2200.00 | $\dagger$ Two $1 / 4$-inch holes, 3 inches on center. |
| DENNESEN | ABLT-1 | A | W | Yes |  | Yes | Adj. | 12 | 0 | Adj. | Any | 100 |  | 2000.00 |  |
| EMINENT TECHNOLOGY | Two | A | W | Yes |  | Yes | 73/8 | 103/4 | 0 | 0-5 | 0-16 | 22 |  | 2000.00 | Includes air pump; optional fluid damping, $\$ 95.00$. |
| GRAHAM ENGINEERING | 1.5 <br> 1.5 t | P <br> P | W <br> W | Yes <br> Yes | Yes <br> Yes | Yes <br> Yes | 91/4 <br> $91 / 4$ | $\begin{aligned} & 111 / 2 \\ & 111 / 2 \end{aligned}$ | 1 <br> 1.0 | $0.90-3.0$ <br> $0.90-3.0$ | $\begin{aligned} & 4-20 \\ & 4-20 \end{aligned}$ | $\begin{aligned} & 140 \\ & 140 \end{aligned}$ |  | $\begin{aligned} & 2350.00 \\ & 2750.00 \end{aligned}$ | Includes cartridge alignment gauge; brass side weights; SME-compatible mounting: upgradable to model below. Includes cartridge and azimuth alignment gauges; tungsten side weights; SME-compatible mounting. |
| KUZMA | Stogi Reference Stogi | $\begin{aligned} & P \\ & P \end{aligned}$ | $\begin{aligned} & F \\ & F \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | 91/8 | 103/4 | 2 | $\begin{aligned} & 1-3 \\ & 1-3 \end{aligned}$ |  | 300 | 11/4 | $\begin{array}{r} 1600.00 \\ 950.00 \end{array}$ |  |
| LINN | $\begin{aligned} & \text { Ekos } \\ & \text { Akito } \end{aligned}$ | $\begin{aligned} & P \\ & P \end{aligned}$ | $\begin{array}{\|l\|} \hline F \\ F \end{array}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & 83 / 8 \\ & 83 / 8 \end{aligned}$ | $\begin{aligned} & 9 \\ & 9 \end{aligned}$ |  | $\begin{aligned} & 0-3 \\ & 0-3 \end{aligned}$ | $\begin{aligned} & 4-9 \\ & 2-10 \end{aligned}$ | $\begin{array}{\|l\|} \hline 220 \\ 100 \\ \hline \end{array}$ | $\begin{aligned} & 11 / 4 \\ & 11 / 4 \end{aligned}$ | $\begin{array}{r} 2495.00 \\ 395.00 \end{array}$ |  |
| LONDON (DECCA) | International | P | R | No | Yes | Yes | 83/9 | 103/4 | 0.2 | 0.75-3 | 4-12 | 200 | 11/8 | 225.00 | Damped unipivot with spirit level. |
| MANLEY LABS | Zarathustra S3 | P | R | Yes | Yes | No | 9.18 | 12 |  |  |  |  |  | 750.00 | Unipivot design. |
| M 9 RCH | UP-4 <br> DP-6 <br> DP-6T <br> DP-6X | $P$ <br> P <br> P <br> P | W <br> W <br> W <br> w | Yes <br> Yes <br> Yes <br> Yes | $\begin{array}{\|l\|} \hline \text { Yes } \\ \text { Yes } \\ \text { Yes } \\ \text { Yes } \\ \hline \end{array}$ | Yes <br> Yes <br> Yes <br> Yes | $\begin{aligned} & \hline 91 / 8 \\ & 91 / 8 \\ & 121 / 8 \\ & 91 / 8 \end{aligned}$ | $\begin{aligned} & \hline 113 / 4 \\ & 113 / 4 \\ & 143 / 4 \\ & 113 / 4 \end{aligned}$ |  | $\begin{aligned} & \hline 0.75-3 \\ & 0.75-3 \\ & 1.0-3.5 \\ & 0.75-3 \end{aligned}$ | 3-15 | $\begin{aligned} & 128 \\ & 128 \\ & 128 \end{aligned}$ | $7 / 8$ <br> 7/8 <br> 7/8 <br> $7 / 8$ | $\begin{array}{r} \dagger \\ \\ \text { From } \\ 1150.00 \\ \text { From } \\ 1950.00 \\ \text { From } \\ 2250.00 \end{array}$ | $\dagger$ With copper wire, $\$ 695.00$; with silver wire, $\$ 795.00$. Choice of six armtubes; unipivot; viscous damping. Armtube choice and damping as above, dual bearings. <br> Continuous VTA adjustment; external tonearm wiring. |
| NAIM AUDIO | ARO | P | F | Opt. | Yes | Yes | 9 | 111/2 |  |  | 5.5-12 |  | 3/4 | 1695.00 | Unipivot design; optional Aro-matic cueing lever. |
| ORACLE AUDIO | Beta Plus <br> SME 345 | $\begin{aligned} & P \\ & P \end{aligned}$ | R | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & 8.92 \end{aligned}$ | 9.56 | 0.01 | 0-3 | $\begin{aligned} & 4-20 \\ & 5-14 \end{aligned}$ |  |  | $\begin{array}{r} 450.00 \\ 1795.00 \end{array}$ |  |
| REGA RESEARCH | $\begin{aligned} & \text { RB300 } \\ & \text { RB250 } \end{aligned}$ | P | $F$ F F | Yes <br> Yes | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & \text { No } \\ & \text { No } \end{aligned}$ |  |  |  |  |  |  | 7/8 | $\begin{aligned} & 425.00 \\ & 250.00 \end{aligned}$ | Continuous cable to preamp; hand-selected bearings. Continuous cable to preamp. |
| ROCKPORT TECHNOLOGIES | 6000 Series | A | F | Ves |  | Yes | $61 / 2$ | 9 |  | 0.5-3.5 | 2-15 |  |  | 4500.00 | Azimuth adjustable; viscous damping. |
| ROKSAN | Tabriz Tabriz-Zi Artemiz | $\begin{aligned} & P \\ & P \\ & P \end{aligned}$ | $\begin{array}{\|l} \hline F \\ F \\ F \end{array}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \\ & \text { Ye } \end{aligned}$ | $\begin{array}{\|l\|} \hline \text { Yes } \\ \text { Yes } \\ \text { Yes } \end{array}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{array}{\|l\|} \hline 9.45 \\ 9.45 \\ 9.45 \\ \hline \end{array}$ |  |  | $\begin{aligned} & 1.2-3 \\ & 1.2-3 \\ & 1.2-3.0 \end{aligned}$ | $\begin{aligned} & 5-12 \\ & 5-12 \\ & 5-12 \end{aligned}$ | $\begin{array}{\|l\|} \hline 150 \\ 150 \\ 150 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline 0.91 \\ 0.91 \\ 0.91 \\ \hline \end{array}$ | $\begin{array}{r} 600.00 \\ 850.00 \\ 1550.00 \end{array}$ |  |
| SUMIKO/SME | Series 309 <br> Series IV.Vi <br> Series V | P <br> P <br> P | R <br> F <br> F | Yes Yes Yes | Yes <br> Yes <br> Yes | Yes Yes Yes | $\begin{array}{\|l\|} \hline 91 / 8 \\ 91 / 8 \\ 91 / 8 \end{array}$ | $\begin{aligned} & 115 / 8 \\ & 11^{5 / 8} \\ & 115 / 8 \end{aligned}$ |  | $\begin{aligned} & 0-3 \\ & 0-3 \\ & 0-3 \end{aligned}$ | $\begin{aligned} & 4-18 \\ & 4-18 \\ & 4-18 \end{aligned}$ | $\begin{aligned} & 140 \\ & 140 \\ & 140 \end{aligned}$ | $\begin{aligned} & 11 / 3 x \\ & 2^{3 / 4} \end{aligned}$ | $\begin{aligned} & 1195.00 \\ & 1995.00 \\ & 2550.00 \end{aligned}$ | ABEC-3 bearings: damped aluminum casting. <br> ABEC-7 bearings; damped magnesium casting; adjustable static tracking. Bearings and casting as above; adjustable dynamic and static tracking. |
| TOWNSHEND AUDIO | Excalibur | P | F | Ves | Yes | Yes | 8.58 | 8.66 | 1.85 | 0.5-5 | 4-20 | 300 | 1 | 1600.00 | Front outrigger damping; for Townshend Audio Rock turntables. |
| WELL TEMPERED LAB | Well Tempered Record Player Arm <br> Well Tempered Classic Arm Well Tempered Reference Arm | P <br> P <br> P | F <br> F <br> F | No <br> No <br> No | Yes <br> Yes <br> Yes | Yes <br> Yes <br> Yes | 9 <br> 9 <br> 9 | $\begin{aligned} & 113 / 8 \\ & 113 / 8 \\ & 111 / 8 \end{aligned}$ |  |  |  |  | 7/8 <br> $1 / 4$ <br> $1 / 4$ | $\begin{array}{r} 695.00 \\ \\ 995.00 \\ 1595.00 \end{array}$ | Variable viscous damping. <br> As above. <br> As above. |

## For the Record...



## BENZ OHIS MICRO

SURROUNDINGS
Musical

5856 Collese Avenue, suite 94618 Oakland, Califo 510.420 .0319 $F_{2 \times} 510.420 .0392$

## PHONO CARTRIDGES

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline \begin{tabular}{l}
STYLUS TYPE \\
C-Conical \\
S-Spherical \\
E-Elliptical \\
M-MicroLine, \\
MicroRidge, or \\
\(\checkmark\)-van den Hul \\
X-Hyper-Elliptical, \\
Stereohedron, Fine \\
Line Contact, Long Lis \\
Line Trace, or simila \\
MANUFACTURER
\end{tabular} \&  \&  \&  \&  \& iodIId \&  \&  \&  \& - \&  \&  \& \& \&  \&  \&  \\
\hline ARCAM \& \[
\begin{aligned}
\& \text { E77MG } \\
\& \text { P77MG }
\end{aligned}
\] \& \& \begin{tabular}{l|l}
MM \& No \\
MM \& No
\end{tabular} \& \& \& \& \[
\begin{aligned}
\& 1.6-2 \\
\& 1.6-2
\end{aligned}
\] \& \[
\begin{aligned}
\& 200-400 \\
\& 200-400
\end{aligned}
\] \& \[
\begin{aligned}
\& \mathrm{E} \\
\& \mathrm{X}
\end{aligned}
\] \& \& 20/ \& \[
\begin{aligned}
\& \mathrm{U} \\
\& \mathrm{U}
\end{aligned}
\] \& S \& \[
\begin{aligned}
\& 6.3 \\
\& 6.3
\end{aligned}
\] \& \[
\begin{aligned}
\& 150.00 \\
\& 185.00
\end{aligned}
\] \& \[
\begin{array}{r}
95.00 \\
125.00
\end{array}
\] \\
\hline AUDIO BY VAN ALSTINE \& Longhorn Z \& 10-55 \(\pm 1.5\) \& \begin{tabular}{l|l|l} 
IM \& No
\end{tabular} \& 30 \& 25 \& 5.6 \& 1.5-2.0 \& \& E \& \(0.3 \times 0.6\) \& \& U/F \& S \& 8 \& 99.00 \& 45.00 \\
\hline AUDIO NOTE \& 10-2 10-Ltd Soara \& \[
\begin{aligned}
\& 10-50 \pm 3 \\
\& 10-50 \pm 2
\end{aligned}
\] \& \begin{tabular}{l|l} 
\& \\
\(M C\) \& No \\
\(M C\) \& No \\
MC \&
\end{tabular} \& \[
\begin{aligned}
\& 25 \\
\& 30
\end{aligned}
\] \& \& \[
\begin{aligned}
\& 0.05 \\
\& 0.04 \\
\& 0.06
\end{aligned}
\] \& \(1.3-3.5\)
\(1.5-4.0\)
1.5 \& \& V \& \& \(15 / 10\)
\(15 / 10\) \& F
F
F \& S \& 18
19
11 \& \[
\begin{aligned}
\& 2695.00 \\
\& 4995.00 \\
\& 1395.00
\end{aligned}
\] \& \[
\begin{aligned}
\& 1495.00 \\
\& 1995.00
\end{aligned}
\] \\
\hline AUDIOQUEST \& \begin{tabular}{l}
AQM-1 \\
AQ MC-3 \\
AQ MC-5 \\
AQ 404i-MH \\
AQ 404i-L \\
AQ B-200MH \\
AQ B-200L \\
AQ 7000NSX
\end{tabular} \& \[
\begin{aligned}
\& 15-30 \\
\& 15-35 \\
\& 10-40 \\
\& 10-50 \\
\& 10-50 \\
\& 10-50 \\
\& 10-50 \\
\& 10-50
\end{aligned}
\] \& \begin{tabular}{l|l} 
\& \\
\hline IM \& No \\
MC \& No \\
MC \& No \\
MC \& Yes \\
MC \& Yes \\
MC \& Yes \\
MC \& Yes \\
MC \& No
\end{tabular} \& \[
\begin{aligned}
\& 25 \\
\& 25 \\
\& 30 \\
\& 30 \\
\& 30 \\
\& 30 \\
\& 30 \\
\& 30
\end{aligned}
\] \& \[
\begin{aligned}
\& 20 \\
\& 20 \\
\& 25 \\
\& 25 \\
\& 25 \\
\& 25 \\
\& 25 \\
\& 25
\end{aligned}
\] \& \[
\begin{aligned}
\& 3.0 \\
\& 2.5 \\
\& 1.4 \\
\& 1.4 \\
\& 0.5 \\
\& 1.4 \\
\& 0.5 \\
\& 0.3
\end{aligned}
\] \& \[
\begin{aligned}
\& 1.5 \\
\& 2.0 \\
\& 1.8 \\
\& 1.9 \\
\& 1.9 \\
\& 1.9 \\
\& 1.9 \\
\& 1.9
\end{aligned}
\] \& \& \[
\begin{aligned}
\& E \\
\& E \\
\& X \\
\& X \\
\& X \\
\& X \\
\& X \\
\& X
\end{aligned}
\] \& \[
\begin{aligned}
\& 0.3 \times 0.7 \\
\& 0.3 \times 0.7 \\
\& 0.3 \times 1.6 \\
\& 0.3 \times 1.6 \\
\& 0.3 \times 1.6 \\
\& 0.3 \times 1.6 \\
\& 0.3 \times 1.6 \\
\& 0.3 \times 1.6
\end{aligned}
\] \& \& \[
\begin{aligned}
\& U \\
\& U \\
\& \mathrm{~F} \\
\& \mathrm{~F} \\
\& \mathrm{~F} \\
\& \mathrm{~F} \\
\& \mathrm{~F} \\
\& \mathrm{~F}
\end{aligned}
\] \& \[
\begin{aligned}
\& \mathrm{S} \\
\& \mathrm{~S} \\
\& \mathrm{~S} \\
\& \mathrm{~S} \\
\& \mathrm{~S}
\end{aligned}
\] \& \[
\begin{array}{|l}
4.5 \\
8.1 \\
8.1 \\
9.2 \\
9.2 \\
9.5
\end{array}
\] \& \[
\begin{array}{r}
99.00 \\
195.00 \\
395.00 \\
695.00 \\
695.00 \\
995.00 \\
995.00 \\
1795.00
\end{array}
\] \& \[
\begin{array}{r}
50.00 \\
135.00 \\
335.00 \\
595.00 \\
595.00 \\
750.00 \\
750.00 \\
1295.00
\end{array}
\] \\
\hline AUDIO "78" \& Cartridges and styli for vintage sources \& \& MM \& \& \& \& \& \& \[
\begin{aligned}
\& \mathrm{C} / \\
\& \mathrm{E}
\end{aligned}
\] \& \& \& U \& S \& \& \& 69.00 \\
\hline AUDIO-TECHNICA \& \begin{tabular}{l}
AT300P \\
AT301EP \\
AT311EP \\
AT316EP \\
AT331LP \\
AT132EP \\
AT70 \\
AT71E \\
AT120 E/T \\
AT440ML \\
ATP-2 \\
ATP-2XN \\
(w/2 Styli)
\end{tabular} \& \[
\begin{aligned}
\& 20-22 \pm 1 \\
\& 15-25 \pm 1 \\
\& 15-27 \pm 1 \\
\& 10-27 \pm 1 \\
\& 10-30 \pm 1 \\
\& 10-30 \pm 1 \\
\& 20-20 \pm \pm .5 \\
\& 20-22 \pm \pm .5 \\
\& 15-25 \pm \pm 1 \\
\& 5-32 \pm 1 \\
\& 15-22 \pm \pm .5 \\
\& 15-22 \pm 1.5
\end{aligned}
\] \& \begin{tabular}{l|l}
MM \& \(\mathrm{N}_{0}\) \\
\(M M\) \& \(\mathrm{~N}_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\)
\end{tabular} \& \[
\begin{aligned}
\& 26 \\
\& 26 \\
\& 29 \\
\& 29 \\
\& 31 \\
\& 30 \\
\& 20 \\
\& 22 \\
\& 29 \\
\& 30 \\
\& 23 \\
\& 23
\end{aligned}
\] \& \[
\begin{aligned}
\& 16 \\
\& 17 \\
\& 18 \\
\& 20 \\
\& 21 \\
\& 20 \\
\& 15 \\
\& 17 \\
\& 20 \\
\& 20 \\
\& 17 \\
\& 17
\end{aligned}
\] \& \[
\begin{aligned}
\& 5 \\
\& 5 \\
\& 5 \\
\& 5 \\
\& 5 \\
\& 5 \\
\& 5.0 \\
\& 3.5 \\
\& 3.5 \\
\& 5.0 \\
\& 5 \\
\& 5.3 \\
\& 5.3
\end{aligned}
\] \& \[
\begin{aligned}
\& 1.0-1.5 \\
\& 1.0-1.5 \\
\& 1.0-1.5 \\
\& 1.0-1.5 \\
\& 1.0-1.5 \\
\& \\
\& 1.0-1.5 \\
\& 1.5-2.5 \\
\& 1-2 \\
\& 1.0-1.8 \\
\& 0.8-1.6 \\
\& 3-5 \\
\& 3-5
\end{aligned}
\] \& \[
\begin{aligned}
\& 100-200 \\
\& 100-200 \\
\& 100-200 \\
\& 100-200 \\
\& 100-200 \\
\& 100-200 \\
\& 100-200 \\
\& 100-200 \\
\& 100-200 \\
\& 100-200 \\
\& 200 \\
\& 200
\end{aligned}
\] \& \[
\begin{aligned}
\& \mathrm{C} \\
\& \mathrm{E} \\
\& \mathrm{E} \\
\& \mathrm{E} \\
\& \mathrm{X} \\
\& \mathrm{E} \\
\& \mathrm{C} \\
\& \mathrm{E} \\
\& \mathrm{E} \\
\& \mathrm{M} \\
\& \mathrm{E} \\
\& \mathrm{E}
\end{aligned}
\] \& \begin{tabular}{l}
0.6 \\
\(0.4 \times 0.7\) \\
\(0.3 \times 0.7\) \\
\(0.3 \times 0.7\) \\
Linear \\
Contact \\
c. \(2 \times 0.7\) \\
C. 6 \\
\(0.4 \times 0.7\) \\
\(0.3 \times 0.7\) \\
\(04 \times 0.7\) \\
\(04 \times 0.7\)
\end{tabular} \& \& \(U\)
\(U\)
\(U\)
\(U\)
\(U\)
\(U\)
\(U\)
\(U\)
\(U\)
\(U\)
\(U\)
\(U\) \& \[
\begin{aligned}
\& \text { P/S } \\
\& \text { P/S } \\
\& \text { P/S } \\
\& P / S \\
\& P / S \\
\& P \\
\& S \\
\& S \\
\& S \\
\& S \\
\& S \\
\& S
\end{aligned}
\] \& 6
6
6
6
6

6.4
6.5
7.2

7.2 \& $$
\begin{array}{r}
55.00 \\
65.00 \\
75.00 \\
100.00 \\
145.00 \\
150.00 \\
45.00 \\
55.00 \\
95.00 \\
195.00 \\
60.00 \\
90.00
\end{array}
$$ \& \[

$$
\begin{aligned}
& 25.00 \\
& 30.00 \\
& 35.00 \\
& 50.00 \\
& 65.00 \\
& 65.00 \\
& 25.00 \\
& 35.00 \\
& 50.00 \\
& 85.00 \\
& 35.00
\end{aligned}
$$
\] <br>

\hline BANG \& OLUFSEN \&  \& \[
$$
\begin{aligned}
& 20-20 \pm 1 \\
& 20-20 \pm 1.5 \\
& 20-20 \pm 2.5
\end{aligned}
$$

\] \& |  |  |
| :--- | :--- |
| $M 1$ | Yes |
| MI | Yes |
| MI | Yes | \& \[

$$
\begin{aligned}
& 30 \\
& 25 \\
& 22
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 22 \\
& 20 \\
& 17
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 2.12 \\
& 2.12 \\
& 2.12
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 1 \\
& 1 \\
& 1.2
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 200-400 \\
& 200-400 \\
& 200-400
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& X \\
& X \\
& E
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.1 \times 0.1 \\
& 0.12 \times 0.12 \\
& 0.2 \times 0.2
\end{aligned}
$$

\] \& \& \[

$$
\begin{array}{|l}
\hline \text { No } \\
\text { No } \\
\text { No } \\
\hline
\end{array}
$$

\] \& ! \& \[

$$
\begin{array}{|l}
\hline 1.6 \\
1.6 \\
1.6 \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 500.00 \\
& 270.00 \\
& 100.00
\end{aligned}
$$
\] \& <br>

\hline BENZ-MICRO \& MC Ruby MC Reterence MC H2O MC M0.9 MC L0.4 Glider MC Gold MC Silver MC 20E II \& \[
$$
\begin{aligned}
& 10-50 \pm 0.5 \\
& 10-50 \pm \pm .5 \\
& 10-50 \pm 0.5 \\
& 10-50 \pm 0.5 \\
& 10-50 \pm 0.5 \\
& 10-50 \pm 0.5 \\
& 20-40 \pm 0.5 \\
& 20-40 \pm 0.5 \\
& 15-40 \pm 0.5
\end{aligned}
$$

\] \& | MC | Yes |
| :--- | :--- |
| MC | Yes |
| MC | Yes |
| MC | Yes |
| MC | Yes |
| MC | Yes |
| MC | No |
| MC | No |
| MC | No | \& \[

$$
\begin{aligned}
& 40 \\
& 40 \\
& 40 \\
& 40 \\
& 40 \\
& 40 \\
& 30 \\
& 30 \\
& 25
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 30 \\
& 30 \\
& 30 \\
& 30 \\
& 30 \\
& 30
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.3 \\
& 0.4 \\
& 2.0 \\
& 0.9 \\
& 0.4 \\
& 1 \\
& 0.4 \\
& 2.0 \\
& 2.5
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 2-2.5 \\
& 2-2.5 \\
& 2-2.5 \\
& 2-2.5 \\
& 2-2.5 \\
& 2-2.5 \\
& 1.8-2.2 \\
& 1.8-2.2 \\
& 1.7-2.3
\end{aligned}
$$

\] \& \& \[

$$
\begin{aligned}
& M \\
& M \\
& M \\
& M \\
& M \\
& M \\
& E \\
& E \\
& E
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.16 \times 3.15 \\
& 03 \times 0.7 \\
& 0.3 \times 0.7 \\
& 03 \times 0.7
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 15 / 15 \\
& =15 / 15 \\
& 15 / 15 \\
& 15 / 15 \\
& 15 / 15 \\
& 15 / 15 \\
& 15 / 15 \\
& 15 / 15
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& F \\
& F \\
& F \\
& F \\
& F \\
& F \\
& F \\
& F \\
& U
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \hline- \\
& \hline \\
& S \\
& S \\
& S \\
& S \\
& S \\
& S \\
& S \\
& S \\
& S
\end{aligned}
$$
\] \& 1.6

8.6
8.6
8.6
8.6
8.6
6.2
5.7
5.7

4 \& $$
\begin{array}{r}
3000.00 \\
2500.00 \\
1800.00 \\
1500.00 \\
1200.00 \\
750.00 \\
325.00 \\
325.00 \\
125.00
\end{array}
$$ \& \[

$$
\begin{array}{r}
500.00 \\
500.00 \\
500.00 \\
500.00 \\
500.00 \\
400.00 \\
175.00 \\
175.00 \\
75.00
\end{array}
$$
\] <br>

\hline CHADWICK MODIFICATIONS \& X-5 Super A-1 Super \& \[
$$
\begin{aligned}
& 15-45 \\
& 20-28
\end{aligned}
$$

\] \& | MC | No |
| :--- | :--- |
| IM | No | \& \[

$$
\begin{aligned}
& 30 \\
& 30
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 28 \\
& 24
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 2 \\
& 3.5
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 2 \\
& 2
\end{aligned}
$$

\] \& \& \[

\underset{\mathrm{E}}{\mathrm{M}}

\] \& $0.3 \times 0.6$ \& \[

$$
\begin{aligned}
& 20 / 18 \\
& 23 / 23
\end{aligned}
$$

\] \& \[

F

\] \& \[

$$
\begin{aligned}
& \mathrm{S} \\
& \mathrm{P} / \mathrm{S}
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 5 \\
& 5
\end{aligned}
$$

\] \& \& \[

$$
\begin{aligned}
& 375.00 \\
& 175.00
\end{aligned}
$$
\] <br>

\hline CLEARAUDIO \& | Gamma |
| :--- |
| Gamma-S |
| Delta |
| Delta-S |
| Veritas |
| Veritas-S |
| Signature |
| Accurate |
| Insider | \& \[

$$
\begin{aligned}
& 20-20 \pm 2 \\
& 20-20 \pm 2 \\
& 20-20 \pm 2 \\
& 20-20 \pm 2 \\
& 20-30 \pm 2 \\
& 20-30 \pm 2 \\
& 20-30 \pm 2 \\
& 20-40 \pm 2 \\
& 20-50 \pm 2
\end{aligned}
$$

\] \& |  |  |
| :--- | :--- |
| $M C$ | Yes |
| $M C$ | Yes |
| $M C$ | Yes |
| $M C$ | Yes |
| $M C$ | Yes |
| MC | Yes |
| $M C$ | Yes |
| $M C$ | Yes |
| $M C$ | Yes | \& \[

$$
\begin{aligned}
& 35 \\
& 35 \\
& 35 \\
& 35 \\
& 35 \\
& 35 \\
& 35 \\
& 40 \\
& 40
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 35 \\
& 35 \\
& 35 \\
& 35 \\
& 35 \\
& 35 \\
& 35 \\
& 40 \\
& 40
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 0.6 \\
& 0.6 \\
& 0.6 \\
& 0.6 \\
& 0.6 \\
& 0.6 \\
& 0.7 \\
& 0.7 \\
& 0.7
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 1.6-2.2 \\
& 1.6-2.2 \\
& 1.6-2.2 \\
& 1.6-2.2 \\
& 1.6-2.2 \\
& 1.6-2.2 \\
& 1.6-2.2 \\
& 1.6-2.2 \\
& 1.6-2.2
\end{aligned}
$$

\] \& \& \& \[

$$
\begin{aligned}
& 02 \times 1.6 \\
& 02 \times 1.6 \\
& 0.2 \times 1.6 \\
& 0.2 \times 1.6 \\
& 0.2 \times 1.6 \\
& 0.2 \times 1.6 \\
& 0.2 \times 1.6 \\
& 0.2 \times 1.6 \\
& 0.2 \times 1.6
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 15 / 15 \\
& 15 / 15 \\
& 15 / 15 \\
& 15 / 15 \\
& 15 / 15 \\
& 15 / 15 \\
& 15 / 15 \\
& 15 / 15 \\
& 15 / 15
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& F \\
& F \\
& F \\
& F \\
& F \\
& F \\
& F \\
& F
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \hline \mathrm{S} \\
& \mathrm{~S} \\
& \mathrm{~S} \\
& \mathrm{~S} \\
& \mathrm{~S} \\
& \mathrm{~S} \\
& \mathrm{~S} \\
& \mathrm{~S} \\
& \mathrm{~S}
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 10 \\
& 10.3 \\
& 11.6 \\
& 10 \\
& 10.5 \\
& 11.5
\end{aligned}
$$

\] \& \[

$$
\begin{array}{r}
600.00 \\
760.00 \\
1040.00 \\
1230.00 \\
1460.00 \\
1800.00 \\
2100.00 \\
3920.00 \\
7320.00
\end{array}
$$
\] \& <br>

\hline CREDO \& Pro 81MC \& 10-35 \& MC $\quad$ Yes \& 30 \& 25 \& 3.5 \& 1.8-2.0 \& 350 \& X \& \& 15/15 \& F \& S \& 9 \& 990.00 \& 450.00 <br>
\hline DENON \& DL-160
DL-110 \& $20-50$

$20-46$ \& \[
$$
\begin{aligned}
& M C \\
& M C
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 28 \\
& 25
\end{aligned}
$$
\] \& \& 1.6

1.6 \& $1.5-2.1$

$1.5-2.1$ \& \& \& \& \& \[
$$
\begin{aligned}
& F \\
& F
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \mathrm{S} \\
& \mathrm{~S}
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 4.8 \\
& 4.8
\end{aligned}
$$

\] \& \[

$$
\begin{array}{r}
125.00 \\
95.00
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 75.00 \\
& 57.00
\end{aligned}
$$
\] <br>

\hline DESKADEL \& MC1 Eco MC1S MkII MC2 Finish \& \[
$$
\begin{aligned}
& 10-50 \pm 1.0 \\
& 5-80 \pm 1.0 \\
& 3-100 \pm 1.0
\end{aligned}
$$

\] \& |  |  |
| :--- | :--- |
| MC | Yes |
| MC | Yes |
| MC | Yes | \& \[

$$
\begin{aligned}
& 38 \\
& 50 \\
& 60
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 38 \\
& 60 \\
& 60
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \hline 0.25 \\
& 0.2 \\
& 0.18
\end{aligned}
$$

\] \&  \& \[

$$
\begin{aligned}
& 150 \\
& 150 \\
& 845
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& x \\
& x \\
& x
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 03 \times 0.7 \\
& 03 \times 0.7 \\
& 0.3 \times 0.7
\end{aligned}
$$

\] \& \& \[

$$
\begin{aligned}
& F \\
& F \\
& F
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \hline \mathrm{S} \\
& \mathrm{~S} \\
& \mathrm{~S}
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline 12 \\
10 \\
10 \\
\hline
\end{array}
$$
\] \& 1595.00 2995.00

5500.00 \& 750.00 1500.00 2500.00 <br>

\hline DYNAVECTOR \& $$
\begin{aligned}
& \text { XX-1L } \\
& \text { XX-1 } \\
& 17 D 2 M k \| \\
& 23 R S M k \\
& 10 \times 4 M k \| \\
& 50 \times 4 M k \|
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& 20-50 \pm 2 \\
& 20-50 \pm 2 \\
& 20-100 \pm 2 \\
& 20-80 \pm 2 \\
& 20-20 \pm 2 \\
& 20-20 \pm 2
\end{aligned}
$$

\] \& |  | MC |
| :--- | :--- |
| $M C$ | Yes |
| $M C$ | Yes |
| $M C$ | Yes |
| $M C$ | No |
| $M C$ | No | \& \[

$$
\begin{aligned}
& 30 \\
& 30 \\
& 25 \\
& 25 \\
& 25 \\
& 25
\end{aligned}
$$

\] \& \& \[

$$
\begin{aligned}
& 0.25 \\
& 2.0 \\
& 0.15 \\
& 0.15 \\
& 2.0 \\
& 2.0
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 1.9-2.3 \\
& 1.8-2.2 \\
& 1.8-2.0 \\
& 1.7-1.9 \\
& 1.5-1.9 \\
& 1.5-1.7
\end{aligned}
$$

\] \& \& \[

$$
\begin{aligned}
& M \\
& X \\
& X \\
& M \\
& M \\
& E \\
& E
\end{aligned}
$$

\] \& \& \& \[

$$
\begin{aligned}
& \hline F \\
& F \\
& F \\
& F \\
& F \\
& F
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \hline S \\
& S \\
& S \\
& S \\
& S \\
& S \\
& S
\end{aligned}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline 12 \\
12 \\
5.3 \\
5.3 \\
4.6 \\
4.5
\end{array}
$$

\] \& 1100.00 1100.00 620.00 470.00 260.00 210.00 \& \[

$$
\begin{aligned}
& 880.00 \\
& 880.00 \\
& 496.00 \\
& 376.00 \\
& 208.00 \\
& 168.00
\end{aligned}
$$
\] <br>

\hline ESOTERIC SOUND (Replacement styli for Stanton 500 series) \& ES30T ES35T ES40T ES80S \& | 20-17 |
| :--- |
| 20-17 |
| 20-16 |
| $20 \cdot 15$ | \& | MI | No |
| :--- | :--- |
| MI | No |
| MI | No |
| MI | No | \& \& \& \& \[

$$
\begin{aligned}
& 2-5 \\
& 2-5 \\
& 2-5 \\
& 2-5
\end{aligned}
$$

\] \& \& | C |
| :--- |
| C |
| C |
| S | \& 3.0 , truncated 3.5, truncated 4.0, truncated 8.0 \& | 10/10 |
| :--- |
| 10/10 |
| 10/10 |
| $10 / 10$ | \& \[

$$
\begin{aligned}
& \mathrm{U} \\
& \mathrm{U} \\
& \mathrm{U} \\
& \mathrm{U}
\end{aligned}
$$

\] \& \& \& \& | $75.00$ $75.00$ |
| :--- |
| 75.00 75.00 | <br>

\hline
\end{tabular}

## PHONO CARTRIDGES




## PHONO CARTRIDGES

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline \begin{tabular}{l}
STYLUS TYPE \\
C-Conical \\
S-Spherical \\
E—Elliptical \\
M-MicroLine, \\
MicroRidge, or \\
\(\checkmark\)-van den Hul \\
X-Hyper-Elliptical, \\
Stereohedron, Fine \\
Line Contact, Long L \\
Line Trace, or simila \\
MANUFACTURER
\end{tabular} \&  \&  \&  \&  \&  \&  \&  \&  \& \&  \&  \& \& \&  \&  \&  \\
\hline KAB ELECTROACOUSTICS \& \begin{tabular}{l}
KS500-27 \\
(78-rpm only)
\end{tabular} \& 10-17 \& MM \& 25 \& \& 10 \& 3-7 \& 275 \& S \& \(2.7 \times 2.7\) \& 10/10 \& U \& S \& 6 \& 42.95 \& 30.00 \\
\hline LINN \& \begin{tabular}{l}
K5 \\
K9 \\
K18II \\
Klyde \\
Arkiv
\end{tabular} \& \[
\begin{aligned}
\& 20-20 \pm 2 \\
\& 20-20 \pm 2 \\
\& 20-20 \pm 1 \\
\& 20-20 \pm 1 \\
\& 20-20 \pm 1
\end{aligned}
\] \& \begin{tabular}{l|l} 
\& \\
\(M M\) \& No \\
\(M M\) \& \(N O\) \\
\(M M\) \& \(N O\) \\
\(M C\) \& \(N 0\) \\
\(M C\) \& No
\end{tabular} \& \[
\begin{aligned}
\& 20 \\
\& 20 \\
\& 30 \\
\& 30 \\
\& 30
\end{aligned}
\] \& \& 4.5
4.5
4.5
0.15
0.15 \& 1.7
1.7
1.7
1.7
1.7 \& 200
200
200 \& \begin{tabular}{l} 
E \\
\hline E \\
E \\
E \\
E
\end{tabular} \& \& \[
\begin{aligned}
\& 12 / 12 \\
\& 12 / 12 \\
\& 14 / 14 \\
\& 10 / 10 \\
\& 10 / 10
\end{aligned}
\] \& U
U
U \& S
\(S\)
\(S\)
\(S\)
\(S\)
\(S\) \& 6
7
7
7.8
8
8 \& \[
\begin{array}{r}
150.00 \\
295.00 \\
595.00 \\
1095.00 \\
2195.00
\end{array}
\] \&  \\
\hline LONDON (DECCA) \& \begin{tabular}{l}
Jubilee \\
Super Gold \\
Gold \\
Maroon
\end{tabular} \& \[
\begin{aligned}
\& 20-22 \pm 3 \\
\& 20-22 \pm 3 \\
\& 20-22 \pm 3 \\
\& 20-22 \pm 3
\end{aligned}
\] \& \begin{tabular}{l|l} 
\& \\
\hline M \& No \\
IM \& No \\
IM \& No \\
IM \& No
\end{tabular} \& \[
\begin{aligned}
\& 25 \\
\& 25 \\
\& 25 \\
\& 25
\end{aligned}
\] \& \& 5
5
5
5 \& \[
\begin{aligned}
\& 1.8-2.2 \\
\& 1-2 \\
\& 1-2 \\
\& 1.6-2.2
\end{aligned}
\] \& \[
\begin{aligned}
\& 220 \\
\& 220 \\
\& 220 \\
\& 220
\end{aligned}
\] \& \begin{tabular}{l} 
X \\
\hline \\
V \\
E \\
S
\end{tabular} \& \& \[
\begin{aligned}
\& 10 / 15 \\
\& 10 / 15 \\
\& 10 / 15 \\
\& 10 / 15
\end{aligned}
\] \& F
F
F
F \& S
S
S
S \& 10
6.7
6.7
6.7 \& \[
\begin{array}{r}
1600.00 \\
650.00 \\
525.00 \\
450.00
\end{array}
\] \& \[
\begin{aligned}
\& 450.00 \\
\& 240.00 \\
\& 200.00 \\
\& 165.00
\end{aligned}
\] \\
\hline \begin{tabular}{l}
JOHN \\
MARDVSKIS
\end{tabular} \& JMAS MIT-1 \& 10-10 \(\pm 1.0\) \& \begin{tabular}{l|l|} 
MC \& No
\end{tabular} \& 25 \& 20 \& 0.25 \& 2.25-2.5 \& 500 \& V \& \(0.2 \times\) Line \& 116 \& F \& S \& 5.5 \& 650.00 \& 325.00 \\
\hline  \& DACAPO \& 10-40 \(\pm 1\) \& MC No \& 30 \& 25 \& 0.25 \& 1.8-2 \& \& x \& \& 14/14 \& F \& S \& 6.8 \& 1200.00 \& 850.00 \\
\hline ORACLE AUDIO \& \begin{tabular}{l}
Reference \\
Standard
\end{tabular} \& \[
\begin{aligned}
\& 20-20 \pm 1 \\
\& 20-20 \pm 1
\end{aligned}
\] \& \begin{tabular}{l}
MC \\
MC
\end{tabular} \& \[
30
\]
\[
25
\] \& \& \[
\begin{aligned}
\& 0.2 @ \\
\& 3.54 \\
\& \mathrm{~cm} / \mathrm{S} \\
\& 0.4 @ \\
\& 3.54 \\
\& \mathrm{~cm} / \mathrm{S}
\end{aligned}
\] \& \[
\begin{aligned}
\& 1.5-2.3 \\
\& 1.5-2.3
\end{aligned}
\] \& \[
\begin{aligned}
\& 100 \\
\& 100
\end{aligned}
\] \& \begin{tabular}{l}
M \\
\(E\)
\end{tabular} \& \& \[
60 / 3
\]
\[
15 / 8
\] \& \begin{tabular}{l}
F \\
F
\end{tabular} \&  \& \& \[
\begin{aligned}
\& 1995.00 \\
\& 795.00
\end{aligned}
\] \& \\
\hline ORTOFON \& \begin{tabular}{l}
MC7500 \\
MC20SII \\
FF15XEII \\
MC5000 \\
MC3000MII \\
MC10 Super \\
MC305II \\
MC103II \\
MC3 Turbo \\
MC1 Turbo \\
\(\times 5\) MC \\
\(\times 3 \mathrm{MC}\) \\
X1 MC \\
0M30 Super \\
0M20 Super \\
0M10 Super \\
0M5E \\
OM3E \\
TM20UD \\
TM14U \\
TM7
\end{tabular} \& \[
\begin{aligned}
\& 20-20 \pm 2 \\
\& 20-20+4,-1 \\
\& 20-20 \\
\& 20-20 \\
\& +2.5,-0 \\
\& 20-20 \\
\& +2.5,-0 \\
\& 10-30+5,-1 \\
\& 20-20+4 \cdot-1 \\
\& 20-20+4,-1 \\
\& 20-40+3,-1 \\
\& 20-30+3,-1 \\
\& 15-35+4,-1 \\
\& 20-40+3,-1 \\
\& 20-30+3,-1 \\
\& 20-20+2,-0 \\
\& 20-20+2,-1 \\
\& 20-20+3 \\
\& 20-20 \\
\& +3,-1 \\
\& 20-20+3,-2 \\
\& 20-20+3,-1 \\
\& 20-20 \\
\& 20-20
\end{aligned}
\] \& \begin{tabular}{l|l} 
MC \& Yes \\
MC \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M C\) \& \(N_{0}\) \\
\(M C\) \& \(N_{0}\) \\
\& \\
\(M C\) \& \(N_{0}\) \\
\(M C\) \& \(N_{0}\) \\
\(M C\) \& \(N_{0}\) \\
\(M C\) \& \(N_{0}\) \\
\(M C\) \& \(N_{0}\) \\
\(M C\) \& \(N_{0}\) \\
\(M C\) \& \(N_{0}\) \\
\(M C\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\) \\
\(M M\) \& \(N_{0}\)
\end{tabular} \& \begin{tabular}{l}
25 \\
25 \\
20 \\
25 \\
25 \\
25 \\
25 \\
25 \\
25 \\
25 \\
22 \\
22 \\
20 \\
25 \\
20 \\
20
\end{tabular} \& 18 \& \[
\begin{aligned}
\& 0.13 \\
\& 0.2 \\
\& 6 \\
\& 0.14 \\
\& 0.15 \\
\& 0.3 \\
\& 0.2 \\
\& 0.2 \\
\& 3.3 \\
\& 3.3 \\
\& 2.2 \\
\& 2.2 \\
\& 2.2 \\
\& 4 \\
\& 4 \\
\& 4 \\
\& 4 \\
\& 4 \\
\& 3.5 \\
\& 4.5 \\
\& 5
\end{aligned}
\] \& \[
\begin{aligned}
\& 2-3 \\
\& 1.6-2 \\
\& 1-1.5 \\
\& 2.2-2.7 \\
\& 1.7-2.2 \\
\& 1.3-1.8 \\
\& 1.6-2.0 \\
\& 1.6-2.0 \\
\& 1.8-2.2 \\
\& 1.8-2.2 \\
\& 1.7-2.2 \\
\& 1.7-2.2 \\
\& 1.7-2.2 \\
\& 1.0-1.5 \\
\& 1.0-1.5 \\
\& 1.25-1.75 \\
\& 1.25-1.75 \\
\& 1.25-1.75 \\
\& 1.0-1.5 \\
\& 1.0-1.5 \\
\& 1.0-1.5
\end{aligned}
\] \& \begin{tabular}{l}
\[
\begin{aligned}
\& 200- \\
\& 400
\end{aligned}
\] \\
300 \\
300 \\
300 \\
300 \\
300 \\
400 \\
400 \\
400
\end{tabular} \& \begin{tabular}{l}
\(x\) \\
X \\
E \\
X \\
X \\
E \\
X \\
X \\
X \\
E \\
X \\
X \\
E X E E \\
E E
\end{tabular} \& \[
\begin{aligned}
\& 0.45 \times 0.10 \\
\& 0.5 \times 0.80 \\
\& 0.8 \times 0.18 \\
\& 0.5 \times 0.10 \\
\& 0.5 \times 0.10 \\
\& \\
\& 0.5 \times 0.8 \\
\& 0.5 \times 0.7
\end{aligned}
\]
\[
\begin{aligned}
\& 0.40 \times 0.8 \\
\& 0.18 \times 0.8 \\
\& 0.18 \times 0.8
\end{aligned}
\] \& \[
\begin{aligned}
\& 12 / 12 \\
\& 15 / 15 \\
\& 12 / 12 \\
\& 13 / 13 \\
\& 14 / 14 \\
\& 16 / 16 \\
\& 15 / 15 \\
\& 13 / 13 \\
\& 13 / 13 \\
\& 12 / 12 \\
\& 13 / 13 \\
\& 13 / 13 \\
\& 40 / 35 \\
\& 3530 \\
\& 30 / 25 \\
\& 25 / 25 \\
\& 25 / 25 \\
\& 35 / 35 \\
\& 3030 \\
\& 30 / 30
\end{aligned}
\] \& \begin{tabular}{l}
\(F\)
F
\(U\) \\
F \\
F \\
F \\
F \\
F \\
F \\
F \\
F \\
F \\
F \\
\(U\)
\(U\)
\(U\)
\(U\)
\[
\begin{aligned}
\& U \\
\& U \\
\& U \\
\& U
\end{aligned}
\]
\end{tabular} \& \[
\begin{aligned}
\& \text { S } \\
\& \text { S } \\
\& \text { S } \\
\& S \\
\& \text { S } \\
\& \text { S } \\
\& S \\
\& S \\
\& S \\
\& S \\
\& S \\
\& S \\
\& S \\
\& \text { P/S } \\
\& \text { P/S } \\
\& \text { P/S } \\
\& \text { P/S } \\
\& \text { P/S } \\
\& \text { P/S } \\
\& \text { P/S } \\
\& \text { P/S } \\
\& \text { P/S } \\
\& \text { P/S }
\end{aligned}
\] \& \[
\begin{aligned}
\& 9.5 \\
\& 9.5 \\
\& 7 \\
\& 10 \\
\& 10 \\
\& 5 \\
\& 5 \\
\& 5 \\
\& 5 \\
\& 5 \\
\& 5 \\
\& 5 \\
\& 5 \\
\& 5 \\
\& \hline
\end{aligned}
\] \& \[
\begin{array}{r}
2800.00 \\
650.00 \\
50.00 \\
2000.00 \\
1600.00 \\
140.00 \\
650.00 \\
450.00 \\
200.00 \\
150.00 \\
300.00 \\
175.00 \\
125.00 \\
225.00 \\
150.00 \\
75.00 \\
50.00 \\
35.00 \\
129.00 \\
89.00 \\
60.00
\end{array}
\] \& 1960.00
390.00
20.00
1400.00
1120.00
100.00
455.00
315.00
150.00
117.00
228.00
127.00
92.00
90.00
60.00
30.00
20.00
12.00
75.00
30.00
25.00 \\
\hline PICKERING \& \[
\begin{aligned}
\& \text { XSV/5000 } \\
\& \text { TL-3S } \\
\& \text { TLE } \\
\& \text { XV-15/625E } \\
\& \text { XV-150DJJ } \\
\& V-15 / D J \\
\& \text { XV-15/625DJ } \\
\& V-15 / D J P \\
\& \text { (W/3 Styli) } \\
\& \text { XV-15/150D.JP } \\
\& \text { (w/3 Styli) } \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 10-50 \\
\& 10-25 \\
\& 10-20 \\
\& 10-25 \\
\& 10-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 10-20
\end{aligned}
\] \& \begin{tabular}{l|l}
MM \& No \\
\(I M\) \& No \\
\(M M\) \& No \\
\(I M\) \& No \\
\(I M\) \& No \\
\(I M\) \& No \\
\(I M\) \& No \\
\(I M\) \& No \\
\(I M\) \& No
\end{tabular} \& \[
\begin{aligned}
\& 35 \\
\& 35 \\
\& 28 \\
\& 35 \\
\& 28 \\
\& 30 \\
\& 30 \\
\& 30 \\
\& 28
\end{aligned}
\] \& \& \[
\begin{aligned}
\& 3.8 \\
\& 4.4 \\
\& 4.4 \\
\& 4.4 \\
\& 8.0 \\
\& 4.4 \\
\& 4.4 \\
\& 4.4
\end{aligned}
\] \& \[
\begin{aligned}
\& 0.75-1.5 \\
\& 0.75-1.5 \\
\& 1-1.5 \\
\& 0.75-1.5 \\
\& 2-4 \\
\& 2-5 \\
\& 1-4 \\
\& 2-5
\end{aligned}
\] \& 275
275
275
275
275
275
275
275
275 \& X
X
E
E
E
E
E
\(E\)
\(E\)
\(S\) \& \[
\begin{aligned}
\& 0.3 \times 2.8 \\
\& 0.3 \times 2.8 \\
\& 0.3 \times 0.7 \\
\& 0.3 \times 0.7 \\
\& 0.3 \times 0.7 \\
\& 0.7 \\
\& 0.7 \\
\& 0.7 \\
\& 0.7
\end{aligned}
\] \& \& \(U\)
\(U\)
\(U\)
\(U\)
\(U\)
\(U\)
\(U\)
\(U\)
\(U\)
\(U\) \& S
\(S\)
P/S
\(S\)
\(S\)
\(S\)
\(S\)
\(S\)
\(S\) \& \[
\begin{aligned}
\& 5.6 \\
\& 5.6 \\
\& 5.9 \\
\& 6.3 \\
\& 6.3 \\
\& 6.3 \\
\& 5.5 \\
\& 5.5 \\
\& \\
\& 5.5
\end{aligned}
\] \& \[
\begin{array}{r}
330.00 \\
185.00 \\
72.60 \\
146.30 \\
140.00 \\
56.75 \\
108.35 \\
85.00 \\
\\
140.00
\end{array}
\] \& \[
\begin{array}{r}
96.00 \\
52.80 \\
26.40 \\
39.60 \\
21.80 \\
16.95 \\
106.98 \\
48.00 \\
\text { Pair } \\
60.00 \\
\text { Pair }
\end{array}
\] \\
\hline REALISTIC \& \begin{tabular}{l}
Realistic/Shure \\
V15 \\
Realistic/Shure R25XT \\
Realistic/Shure R47XT \\
Realistic/Shure RXP3 \\
Realistic/Stanton RS5000DJ Realistic/ Audio-Technica RX1500
\end{tabular} \& \[
\begin{aligned}
\& 5-30 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 20-20 \\
\& 15-25
\end{aligned}
\] \& \begin{tabular}{l|l} 
MM \& Yes \\
MM \& Yes \\
MM \& Yes \\
MM \& Yes \\
MM \& Yes \\
MM \& No
\end{tabular} \& \begin{tabular}{l}
30 \\
20 \\
25 \\
29 \\
28 \\
29
\end{tabular} \& \& \& \[
\begin{aligned}
\& 1.25-1.75 \\
\& 2.5-3.5 \\
\& 1.75-2.25 \\
\& 1.25-1.75 \\
\& 2.5 \\
\& 1.0-1.5
\end{aligned}
\] \& \& E
\(E\)
\(E\)
\(E\)
\(S\)
\(E\) \& \[
\begin{aligned}
\& 1.5 \times 2.0 \\
\& 0.4 \times 0.7 \\
\& 0.4 \times 0.7 \\
\& 0.2 \times 0.7
\end{aligned}
\] \& \& \[
\begin{aligned}
\& U \\
\& U \\
\& U \\
\& U
\end{aligned}
\] \& \begin{tabular}{l}
S \\
S \\
S \\
P
\end{tabular} \& \& \[
\begin{aligned}
\& 50.00 \\
\& 20.00 \\
\& 27.00 \\
\& 30.00 \\
\& 30.00 \\
\& 35.00
\end{aligned}
\] \& \[
\begin{aligned}
\& 14.95 \\
\& 17.95 \\
\& 19.95 \\
\& 19.95 \\
\& 19.95
\end{aligned}
\] \\
\hline REGA RESEARCH \& ```
Elys
Bias
Super Bias
RB78
``` \& \& \begin{tabular}{l}
MM \\
MM \\
MM \\
MM
\end{tabular} \& \& \& \& \[
\begin{aligned}
\& 1.75 \\
\& 1.75 \\
\& 1.75 \\
\& 1.75
\end{aligned}
\] \& \& \& \& \& F
F
F
\(F\) \& S
S
S
S \& \& \[
\begin{array}{r}
199.00 \\
99.00 \\
150.00 \\
99.00
\end{array}
\] \& \\
\hline ROKSAN \& Corus Black Shiraz \& \[
\begin{aligned}
\& 20-20 \\
\& 20-20
\end{aligned}
\] \& \begin{tabular}{l|l} 
MM \& No \\
MC \& Yes
\end{tabular} \& 25 \& \& \[
\begin{aligned}
\& 6.5 \\
\& 1.0
\end{aligned}
\] \& \[
\begin{array}{r}
1.8-2.2 \\
2.0-2.5
\end{array}
\] \& 270 \& \begin{tabular}{|l} 
x \\
\(\times\) \\
\(\times\) \\
\hline
\end{tabular} \& \& 10/25 \& U \& \[
\begin{aligned}
\& \mathrm{S} \\
\& \mathrm{~S}
\end{aligned}
\] \& \[
\begin{aligned}
\& 6.5 \\
\& 8.2
\end{aligned}
\] \& \[
\begin{array}{r}
400.00 \\
1775.00
\end{array}
\] \& \[
\begin{array}{r}
300.00 \\
1300.00
\end{array}
\] \\
\hline SHURE

(Continued) \& | V15 Type V-MR |
| :--- |
| M110HE |
| M104E |
| M92E |
| M55E |
| M44C |
| M44G |
| M44-7 | \& \[

$$
\begin{aligned}
& 20-28 \pm 0.75 \\
& 20-20 \\
& 20-20 \\
& 20-18 \\
& 20-20 \\
& 20-20 \\
& 20-20 \\
& 20-20
\end{aligned}
$$

\] \& |  |  |
| :--- | :--- |
| $M M$ | Yes |
| $M M$ | No |
| $M M$ | No |
| $M M$ | No |
| $M M$ | No |
| $M M$ | No |
| $M M$ | No |
| $M M$ | No | \& \[

$$
\begin{aligned}
& 25 \\
& 25 \\
& 20 \\
& 20 \\
& 20 \\
& 20 \\
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& 20
\end{aligned}
$$

\] \& 18 \& \[

$$
\begin{aligned}
& 3.2 \\
& 4.0 \\
& 5.0 \\
& 5.0 \\
& 6.2 \\
& 9.5 \\
& 6.2 \\
& 9.5
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 1.0-1.25 \\
& 1.25 \\
& 1.25 \\
& 1.25 \\
& 0.75-2 \\
& 3.0-5.0 \\
& 0.75-1.5 \\
& 1.5-3
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 250 \\
& 250 \\
& 250 \\
& 250 \\
& 450 \\
& 450 \\
& 450 \\
& 450
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& M \\
& X \\
& X \\
& E \\
& E \\
& E \\
& S \\
& S \\
& S
\end{aligned}
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$$
\begin{aligned}
& 0.15 \times 3.0 \\
& 0.2 \times 1.5 \\
& 0.2 \times 0.7 \\
& 0.4 \times 0.7 \\
& 0.2 \times 0.7 \\
& 0.7 \\
& 0.6 \\
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$$
\] \& \& $U$

$U$
$U$
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$U$ \& | S |
| :--- |
| P/S P/S P/S S S S S | \& \[

$$
\begin{aligned}
& 6.6 \\
& 5.9 \\
& 5.9 \\
& 5.9 \\
& 6.7 \\
& 6.7 \\
& 6.7 \\
& 6.7
\end{aligned}
$$

\] \& \[

$$
\begin{array}{r}
175.00 \\
69.95 \\
39.95 \\
24.95 \\
54.95 \\
49.95 \\
49.95 \\
49.95
\end{array}
$$

\] \& \[

$$
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115.50 \\
46.20 \\
26.40 \\
16.50 \\
22.50 \\
18.95 \\
18.95 \\
18.95
\end{array}
$$
\] <br>

\hline
\end{tabular}

## PHONO CARTRIDGES




## PHONO CARTRIDGES



Atlantic

## Audiocontrol

# shatideder <br> Our 19th yr. in Business 

LUGASFILM
LUGASFILM
LUGASFILM of Lucasfilm Ltd.


## exicon

 NAD MONSTER CABLE*Velodyne

WE ACCEPT:


INFORMATION \& ORDERS

## © ProAc

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## The Sweet Sound of Vinyl is Back!

- Original Generation Master Tape Source
- Half-Speed Mastered with The GAN System™
- Specially Plated and Pressed on 200 grams of tigh Definition Vlnyl - Dust Free - Static Free Rice Papc- her Sleeves


New Release


MFEL 10210


Claw Ralzase


MFSI 1,212

## LISTEN...



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rales or MYSTERY AND IMAGINATION D:IKGAR AII.A. N POL:

THE
alan parsons PRODECT


The Tradition Continues at Mobile Fidelity Sound Lab.

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## HEADPHONES

| M MANUFACTURER | ষ을 |  |  | ( |  |  |  |  |  |  |  | $\pi 7$ | $7$ |  |  | $\begin{gathered} 5 \\ 58 \\ 58 \end{gathered}$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| AIWA | HP-A360 HP-A260 HP-A160 HP-J6 HP-J3 HP-JB33 HP-J9 HP-X800 HP-X500 HP-X705 HP-XV303 HP-X301 HP-X201 HP-A560 HP-V68 HP-V65 HP-V28 HP-V16 HP-V147 HP-V145 HP-V141 | Dynamic <br> Dynamic <br> Dynamic <br> Dynamic <br> Dynamic Dynamic <br> Dynamic <br> Dynamic <br> Dynamic <br> Dynamic <br> Dynamic <br> Oynamic <br> Oynamic <br> Dynamic <br> Dynamic <br> Dynamic <br> Dynamic | $7-20$ $20-20$ $20-20$ $8-25$ $8-25$ $10-25$ $8-25$ $5-30$ $5-27$ $5-20$ $5-23$ $5-23$ $15-20$ $7-20$ $7-25$ $7-25$ $7-25$ $7-25$ $10-25$ $10-25$ $10-25$ | 40 32 32 16 16 16 16 40 40 40 32 32 32 40 16 16 16 16 16 16 16 | 103 97 92 105 105 105 105 105 105 102 102 102 100 103 109 109 109 109 105 105 105 | 200 mW 100 mW 100 mW 40 mW 40 mW $4 \mathrm{~m} W$ 40 mW 1.5 W 1.5 W $500 \mathrm{~m} W$ $500 \mathrm{~m} W$ $50 \mathrm{~m} W$ $500 \mathrm{~m} W$ $20 \mathrm{~m} W$ $50 \mathrm{~m} W$ $50 \mathrm{~m} W$ $50 \mathrm{~m} W$ $50 \mathrm{~m} W$ $40 \mathrm{~m} W$ 40 mW 40 mW |  | $\begin{array}{\|l} \hline 6.7 \\ 3.6 \\ 3.6 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 10 \\ 10 \\ 5 \\ 16.4 \\ 10 \\ 10 \\ 16 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \end{array}$ | $\begin{aligned} & \text { F } \\ & \text { F } \\ & F \\ & F \\ & F \\ & F \\ & F \\ & F \\ & F \\ & F \\ & F \end{aligned}$ | $A$ $M$ $M$ $M$ $M$ $M$ $M$ $M$ $M$ $A$ $A$ $A$ $A$ $A$ $A$ $A$ $A$ $M$ $M$ $M$ $M$ $M$ $M$ $M$ $M$ | No <br> No <br> No <br> No <br> No <br> No <br> No No <br> No <br> No <br> No <br> No <br> No <br> No <br> No <br> No <br> No <br> No <br> No <br> No No <br> No | C/O $C / 0$ $C / 10$ $S / 1$ $S / I$ $S$ $S$ 1 $C$ $C$ $C$ $C$ $C$ $C$ $C$ $C / 0$ 1 1 1 1 1 1 1 1 1 | $\begin{aligned} & \hline A \\ & F \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & N \\ & A \\ & A \\ & A \\ & F \\ & A \\ & A \\ & A \\ & A \\ & A \\ & N \\ & N \\ & N \\ & N \end{aligned}$ | Foam <br> Foam <br> Foam Plastic <br> Piastic <br> Plastic <br> Plastic <br> Sim. <br> Leather <br> Vinyl Vinyl <br> Vinyl <br> Vinyl <br> Vinyl <br> Vinyl <br> Piastic <br> Plastic <br> Plastic <br> Plastic <br> Plastic Plastic | $\begin{aligned} & 3.3 \\ & 1.9 \\ & 1.4 \\ & 0.9 \\ & 0.5 \\ & 0.5 \\ & 0.2 \\ & 8 \\ & 8 \\ & 4.6 \\ & 8 \\ & 8 \\ & 7 \\ & 3 \\ & 0.2 \\ & 0.2 \\ & 0.2 \\ & 0.2 \\ & 0.2 \\ & 0.2 \\ & 0.2 \end{aligned}$ | $\begin{array}{r} 30.00 \\ 22.00 \\ 15.00 \\ 50.00 \\ 35.00 \\ 15.00 \\ 70.00 \\ 140.00 \\ 100.00 \\ 80.00 \\ 70.00 \\ 55.00 \\ 28.00 \\ 40.00 \\ 40.00 \\ 35.00 \\ 28.00 \\ 20.00 \\ 22.00 \\ 21.00 \\ 15.00 \end{array}$ | Mono/stereo switch. <br> Cord winds into case. Mono/stereo switch. <br> Cord winds into case. |
| AKG | $\begin{aligned} & \text { K500 } \\ & \text { K400 } \\ & \text { K1000 } \\ & \text { K270S } \\ & \text { K2400F } \\ & \text { K240M } \\ & \text { K141/2 } \end{aligned}$ | Oynamic Oynamic Oynamic Dynamic Dynamic Dynamic Dynamic | $\begin{aligned} & 15-27 \\ & 20-26 \\ & 30-25 \\ & 20-20 \\ & 15-20 \\ & 15-20 \\ & 20-20 \end{aligned}$ | 120 120 120 75 600 600 600 | $\begin{array}{\|l\|} \hline 94 \\ 96 \\ 74 \\ 92 \\ 88 \\ 88 \\ 97.5 \end{array}$ | $\begin{aligned} & 200 \mathrm{~mW} \\ & 200 \mathrm{~mW} \\ & 200 \mathrm{~mW} \\ & 200 \mathrm{~mW} \\ & 200 \mathrm{~mW} \\ & 200 \mathrm{~mW} \end{aligned}$ | 0.5 | $\begin{array}{\|l\|l\|} \hline 93 / 4 \\ 93 / 4 \\ 10 \\ 93 / 4 \\ 93 / 4 \\ 93 / 4 \\ 93 / 4 \end{array}$ | $\begin{array}{\|l} \hline R \\ R \\ F \\ R \\ R \\ R \\ R \end{array}$ | M/P/A M/P/A $t$ P M/P/A M/P/A | $\begin{array}{\|l\|} \hline \text { No } \\ \text { No } \\ \text { No } \\ \text { No } \\ \text { No } \\ \text { No } \\ \text { No } \end{array}$ | $\mathrm{C} / 0$ $\mathrm{C} / 0$ $\mathrm{C} / 0$ C C C C S | $\begin{aligned} & \hline A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \end{aligned}$ | Fabric Fabric Vinyl Vinyl Vinyl Vinyl Vinyl | $\begin{array}{\|l\|} \hline 7.8 \\ 7.8 \\ 9.5 \\ 9.5 \\ 8.5 \\ 8.5 \\ 8.0 \end{array}$ | $\begin{aligned} & 229.00 \\ & 189.00 \\ & 99.00 \\ & 209.00 \\ & 169.00 \\ & 139.00 \\ & 119.00 \end{aligned}$ | $\dagger$ Stripped and tinned leads. |
| AUDIO-TECHNICA | $\begin{aligned} & \text { ATH-M3X } \\ & \text { ATH M } 2 X \\ & \text { ATH-P5 } \\ & \text { ATH P3 } \\ & \text { ATH-P1 } \end{aligned}$ | Dynamic <br> Dynamic <br> Oynamic <br> Oynamic <br> Oynamic | $\begin{aligned} & 20-21 \\ & 20-20 \\ & 20-20 \\ & 20-20 \\ & 30-20 \end{aligned}$ | $\begin{aligned} & 4-16 \\ & 4-16 \\ & 40 \\ & 22 \\ & 24 \end{aligned}$ | $\begin{aligned} & 100 \\ & 100 \\ & 100 \\ & 98 \\ & 93 \end{aligned}$ | 100 mW <br> 100 mW <br> 50 mW |  | $\begin{array}{\|l} 11.5 \\ 11.5 \\ 3.3 \\ 3.3 \\ 3.3 \end{array}$ | $\begin{aligned} & \mathrm{F} \\ & \mathrm{~F} \\ & \mathrm{~F} \\ & \mathrm{~F} \\ & \mathrm{~F} \end{aligned}$ | $\begin{array}{\|l\|} \hline \text { M/A } \\ \text { WA } \\ \text { M/A } \\ \text { M/A } \end{array}$ | $\begin{array}{\|l\|l} \text { No } \\ \text { No } \\ \text { No } \\ \text { No } \\ \text { No } \end{array}$ | $\begin{aligned} & C \\ & C \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | A A A $A$ $A$ $A$ | Vinyl Vinyi Foam Foam Foam | $\begin{array}{\|l} 5 \\ 4 \\ 2.5 \\ 3.2 \\ 2 \end{array}$ | $\begin{aligned} & 39.95 \\ & 29.95 \\ & 29.95 \\ & 24.95 \\ & 19.95 \end{aligned}$ |  |
| BANG \& OLUFSEN | Form 1 Form 2 | Oynamic Dynamic | $\begin{aligned} & 20-20 \\ & 40-20 \end{aligned}$ | $\begin{aligned} & 35 \\ & 30 \end{aligned}$ | $\begin{aligned} & 94 \\ & 94 \end{aligned}$ |  |  | $\begin{aligned} & 10 \\ & 10 \end{aligned}$ | $\underset{F}{C}$ | $\begin{aligned} & M / A \\ & M / A \end{aligned}$ | $\begin{array}{\|l\|} \hline N_{0} \\ N_{0} \end{array}$ | $\begin{aligned} & 0 \\ & 0 \end{aligned}$ | $\begin{array}{\|l\|} A \\ A \end{array}$ | Foam Foam | $\begin{aligned} & 5.5 \\ & 2.4 \end{aligned}$ | $\begin{array}{r} 130.00 \\ 85.00 \end{array}$ |  |
| BEYERDYNAMIC | DT-911 DT-901 OT-811 DT-801 DT-531 DT-511 DT-431 DT-411 DT-311 DT-211 DT-211TV IRS-890 IRS-790 DT-770 PRO DT-990 PRO | Dynamic Dynamic Dynamic Dynamic Dynamic Dynamic Dynamic Dynamic Dynamic Dynamic Dynamic Dynamic Dynamic Dynamic Dynamic | $5-35$ $5-30$ $5-35$ $5-30$ $10-30$ $10-22$ $15-20$ $15-20$ $20-20$ $30-18$ $30-18$ $5-35$ $20-23$ $5-35$ $5-35$ | 250 250 250 250 250 250 40 250 40 40 40 250 40 400 600 | $\begin{aligned} & 115 \\ & 115 \\ & 114 \\ & 114 \\ & 115 \\ & 114 \\ & 106 \\ & 122 \\ & 118 \\ & 118 \\ & 118 \\ & 115 \\ & \\ & 116 \\ & 116 \\ & 116 \end{aligned}$ | 50 50 100 100 100 100 100 100 100 100 100 50 100 100 100 | $0.2 \dagger$ $0.25 \dagger$ $0.2 \dagger$ $0.2 \dagger$ 0.2 $0.2 \dagger$ 0.3 $0.2 \dagger$ $0.3 \dagger$ $0.3 \dagger$ $0.3 \dagger$ 0.2 0.3 $0.2 \dagger$ $0.2 \dagger$ | $\begin{aligned} & 10 \\ & 10 \\ & 10 \\ & 10 \\ & 81 / 4 \\ & 10 \\ & 81 / 4 \\ & 10 \\ & 10 \\ & 10 \\ & 20 \\ & \\ & 10 \\ & 10 \end{aligned}$ | $\begin{aligned} & \mathrm{C} \\ & \mathrm{C} \\ & \mathrm{C} \\ & \mathrm{C} \\ & \mathrm{~F} \\ & \mathrm{C} \\ & \mathrm{~F} \\ & \mathrm{~F} \\ & \mathrm{~F} \\ & \mathrm{~F} \\ & \mathrm{~F} \\ & \mathrm{C} \\ & \mathrm{C} \end{aligned}$ | P <br> P <br> P <br> P <br> M/A <br> P <br> M/A <br> P/A <br> P/A <br> P/A <br> P/A | No <br> No <br> No <br> No <br> No <br> No <br> No <br> No <br> No <br> No <br> Yes <br> Yes <br> Yes <br> No <br> No | $C / 0$ $C$ $C / 0$ $C$ $C$ $C / 0$ $C$ $S / 0$ $S / 0$ $S / 0$ $S / 0$ $C / 0$ $C / 0$ $C$ $C / 0$ | $\begin{aligned} & \text { A } \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \end{aligned}$ | Velvet Velvet Velvet Veivet Cloth Velvet Cloth Cloth Cloth Cioth Cioth Cloth | $\begin{aligned} & 10 \\ & 10 \\ & 9 \\ & 9 \\ & 8.6 \\ & 7 \\ & 7.4 \\ & 5 \\ & 5 \\ & 5 \\ & 5 \\ & 11 \\ & 9 \\ & 11 \\ & 9 \\ & 9 \end{aligned}$ | 429.00 389.00 339.00 299.00 199.00 169.00 149.00 99.00 59.00 69.00 369.00 299.00 299.00 339.00 | $\dagger$ At 115 dB . Diffuse-fietd EQ ; replaceable cushion cover. $\dagger$ At 115 oB. As above; closed back. <br> $\dagger$ At 114 dB . Diffuse-field EO; replaceable cushion cover. <br> $\dagger$ At 114 dB. As above; <br> closed back. <br> $\dagger$ At 114 dB . Diffuse-field EQ; replaceable cushion cover. <br> †At 122 dB . <br> $\dagger$ At 118 dB . <br> -At 118 dB . <br> $\dagger$ At 118 dB . Stereo/mono Switch. <br> Cordess; includes IS-790 infrared transmitter; stereo/ mono switch. <br> As above. <br> $\dagger$ At 116 dB . Diffuse-field EQ: closed back. <br> $\dagger$ At 116 dB . Diffuse-field EQ. |
| CALRAD | $\begin{aligned} & 15-115 \\ & 15-118 \\ & 15-185 \\ & 15-145 \\ & 15-148 \\ & 15-116 \\ & 15-120 \end{aligned}$ | Dynamic Dynamic Oynamic Dynamic Dynamic Dynamic | $\begin{aligned} & 20-20 \\ & 20-20 \\ & 20-20 \\ & 20-20 \\ & 18-22 \\ & 25-20 \\ & 20-22 \end{aligned}$ | 32 $4-16$ $4-16$ 432 600 32 40 | 93 <br> 102 <br> 102 <br> 100 <br> 105 <br> 95 <br> 105 | 3.17 |  | $\begin{aligned} & 6 \\ & 6 \\ & 10 \\ & 4 \\ & 7 \\ & 7 \\ & 7 \\ & 7 \end{aligned}$ | $\begin{array}{\|l\|} \hline R \\ C \\ C \\ C \\ F \\ R \\ F \\ F \end{array}$ | $\begin{array}{\|l} \hline p \\ p \\ p \\ p \\ p \\ p \\ p \end{array}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $l$ $C / 0$ $c$ $c$ 0 $c / 0$ $c / 0$ $c / 0$ | $\begin{aligned} & \hline A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & A \end{aligned}$ |  | $\begin{aligned} & 8.5 \\ & 11 \\ & 11 \\ & 0.9 \\ & 6.5 \\ & 4 \\ & 5.6 \end{aligned}$ | 99.00 20.00 15.00 5.00 70.00 29.00 33.00 |  |
| CHASE <br> TECHNOLOGIES | WH 550 | Dynamic | 50-18 |  | 95 |  |  |  |  |  | Yes | C | A | Plastic | 14 | 139.00 | Wireless. |
| DENON | $\begin{array}{\|l} \hline \text { AH-D950 } \\ \text { AH-D750 } \\ \text { AH-D650 } \\ \text { AH-0550 } \\ \text { AH-0350 } \\ \text { AH-0210 } \end{array}$ | Dynamic Oynamic Dynamic Dynamic Dynamic, Dynamic | $\begin{aligned} & 2-31 \\ & 2-30 \\ & 3-29 \\ & 3-28 \\ & 3-26 \\ & 5-26 \end{aligned}$ | $\begin{aligned} & 30 \\ & 30 \\ & 35 \\ & 35 \\ & 32 \\ & 32 \\ & 32 \end{aligned}$ | $\begin{aligned} & \hline 106 \\ & 106 \\ & 106 \\ & 106 \\ & 104 \\ & 104 \end{aligned}$ | $\begin{aligned} & 6.7 \mathrm{~V} \\ & 6.7 \mathrm{~V} \\ & 6 . \mathrm{V} \\ & 6.5 \mathrm{~V} \\ & 5 \mathrm{~V} \\ & 5 \mathrm{~V} \end{aligned}$ |  | $\begin{aligned} & 10 \\ & 10 \\ & 10 \\ & 10 \\ & 10 \\ & 10 \end{aligned}$ | $\begin{aligned} & \mathrm{F} \\ & \mathrm{~F} \\ & \mathrm{~F} \\ & \mathrm{~F} \\ & \mathrm{~F} \\ & \hline \end{aligned}$ | $\begin{aligned} & M / A \\ & M / A \\ & M / A \\ & M / A \\ & M / A \\ & M / A \end{aligned}$ | $\begin{aligned} & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \end{aligned}$ | C $C$ $C$ $C$ $C$ $C$ $C$ | $\begin{aligned} & \hline A \\ & A \\ & A \\ & A \\ & A \\ & A \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|l\|} \hline \text { Vinyl } \\ \text { Vinnyl } \\ \text { Vinyl } \\ \text { Vinyl } \\ \text { Vinyl } \\ \text { Vinyl } \end{array}$ | $\begin{aligned} & 99 \\ & 9 \\ & 7 \\ & 7 \\ & 7.5 \\ & 5.6 \end{aligned}$ | $\begin{array}{r} 150.00 \\ 125.00 \\ 100.00 \\ 75.00 \\ 60.00 \\ 50.00 \end{array}$ |  |
| DISCWASHER | $\begin{aligned} & \text { Micro } 30 \\ & \text { Miro } 40 \\ & \text { Micro } 50 \\ & \text { DR } 60 \\ & \text { DR } 70 \\ & \text { HP } 110 \\ & \text { PRO } 410 \\ & \text { HP } 310 \\ & \text { PRO } 510 \end{aligned}$ |  |  |  |  |  |  |  |  |  |  | $\left\lvert\, \begin{array}{\|l} 1 \\ 1 \\ 1 \\ 1 \\ 1 \end{array}\right.$ | $\begin{aligned} & N \\ & N \\ & N \\ & N \\ & N \\ & N \end{aligned}$ |  |  | $\begin{array}{r} 4.49 \\ 7.99 \\ 9.99 \\ 17.99 \\ 27.99 \\ 3.99 \\ 9.99 \\ 11.99 \\ 17.99 \end{array}$ |  |

# the ultimate surround sound 

Life is stressful. You could spend a few thousand dollars rushing to a weekend getaway at a rejuvenating retreat. You could mortgage your home for one of those "quiet as a recording studio" motor cars you've seen on television. Or you can keep the family fortune and relax in the sanctity of your own home with a pair of Sennheiser headphones.


## HEADPHONES



## HEADPHONES



## HEADPHONES

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline MANUFACTURER \& \multicolumn{2}{|l|}{\multirow[t]{2}{*}{}} \&  \&  \&  \&  \&  \&  \&  \&  \& \[
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e_{2}^{*}
\end{gathered}
\] \&  \\
\hline PICKERING (Conthued) \& \& \& 20-20 \& 32 \& 112 \& 100 mW \& 0.5 \& 71/2 \& c \& P \& No \& 0 \& A \& Vinyl \& 5 \& 50.00 \& \\
\hline PIONEER \& SE-IR550C
SE-M50
SE-500
SE-400D
SE-32
SE-22
SE-12
SE-205 \& Dynamic Dynamic Dyпатіс Dynamic Dynamic Dynamic \& \[
\begin{aligned}
\& 20-25 \\
\& 3-50 \\
\& 5-28 \\
\& 5-26 \\
\& 12-22 \\
\& 30-25 \\
\& 40-20 \\
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\end{aligned}
\] \& \[
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\& 32 \\
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1 \mathrm{~V} \\
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\begin{aligned}
\& 161 / 2 \\
\& 97 / 8 \\
\& 97 / 8 \\
\& 81 / 4 \\
\& 81 / 4 \\
\& 61 / 2 \\
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\] \& \(R\)
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\(R\) \& \begin{tabular}{l}
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\end{tabular} \& Yes \& \[
\begin{aligned}
\& C \\
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\] \& \& \begin{tabular}{l}
Plastic Plastic \\
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Plastic Plastic Plastic Plastic
\end{tabular} \& \[
\begin{aligned}
\& \hline 4.4 \\
\& 8.1 \\
\& 6.2 \\
\& 6.5 \\
\& 3.3 \\
\& 2.2 \\
\& 2.1 \\
\& 16
\end{aligned}
\] \& \[
\begin{array}{r}
275.00 \\
75.00 \\
75.00 \\
65.00 \\
38.00 \\
32.00 \\
23.00 \\
48.00
\end{array}
\] \& Infrared. \\
\hline RADIO SHACK \& Nova-45 Nova-43 Nova-37 Nova-42 Nova-39 Nova-35 \& \[
\begin{aligned}
\& \text { ES } \\
\& \text { ES } \\
\& \text { ES } \\
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\end{aligned}
\] \&  \& A
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\(A\)
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\(A\) \& Plastic Plastic Plastic Plastic Plastic Plastic
Plastic \& \& \[
\begin{aligned}
\& 25.00 \\
\& 20.00 \\
\& 16.00 \\
\& 13.00 \\
\& 10.00 \\
\& 8.00 \\
\& 6.00
\end{aligned}
\] \& \\
\hline RECOTON \& HTS 90
HTS 80
HTS 60
HTS 40
HTS 50
PRO 75
PRO 65
PRO 45
PRO 35
PR 25
PRO 15
PR 44
EG 19
EG 17
EG 16
EG 15
EG 14
EG 12
EG 4
EG 3
EG
EGG 1
EG 33
EG 22
EG 11
EG 10 \& Dynamic
Dynarnic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynaric
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Oynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic \& \(5-30\)
\(10-30\)
\(10-30\)
\(12-28\)
\(18-22\)
\(18-22\)
\(20-20\)
\(18-22\)
\(20-20\)
\(18-20\)
\(18-22\)
\(20-20\) \& \[
\begin{aligned}
\& 40 \\
\& 40 \\
\& 40 \\
\& 40 \\
\& 16 \\
\& 32 \\
\& 32 \\
\& 32 \\
\& 32 \\
\& 32 \\
\& 32 \\
\& 32
\end{aligned}
\] \& \[
\begin{aligned}
\& 98 \\
\& 102 \\
\& 102 \\
\& 104 \\
\& 104
\end{aligned}
\] \& 500 mW
500 mW
500 mW
\(500 \mathrm{~m} W\)
20 mW
120
120
100
100
100
100
20 \& \& \[
\begin{aligned}
\& 8 \\
\& 8 \\
\& 8 \\
\& 8 \\
\& 8 \\
\& 33 / 8 \\
\& 9 \\
\& 9 \\
\& 8 \\
\& 9 \\
\& 5 \\
\& 5 \\
\& 4
\end{aligned}
\] \& \& \(M / A\)
\(M / A\)
\(M / A\)
\(M / A\)
\(M / A\)
\(M / A\)
\(M / A\)
\(M / A\)
\(M / A\)
\(M / A\)
\(M / A\)
\(M / A\) \& \& \[
\begin{aligned}
\& C \\
\& C \\
\& C \\
\& C
\end{aligned}
\] \& \begin{tabular}{l}
N \\
N \\
\(N\)
\(N\)
\(N\)
\(N\)
\(N\)
\end{tabular} \& \& 10
10
7
7
7
\(51 / 2\)
20
14
12
10
10
\(111 / 2\)
8
12
12
12
12
\(91 / 4\)
5
5
5
5
5
\(57 / 8\)
4
4
4
4 \& 149.99
99.99
79.99
59.99
39.99
39.99
34.99
24.99
24.99
24.99
19.99
19.99
19.99
9.99
9.99
14.99
5.9
4.99
14.99
19.99
12.99
8.99
12.99
6.99
6.99
5.99 \& \begin{tabular}{l}
Includes carrying case. \\
As above. \\
As above.
\end{tabular} \\
\hline SENNHEISER \&  \& Dynamic
Dynamic
Dynamic
Dyamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
ES
ES \& \(18-21\)
\(18-22\)
\(16-23\)
\(12-38\)
\(16-22\)
\(20-18\)
\(50-18.5\)
\(20-20\)
\(22-20\)
220
\(20-20\)
\(20-20\)
\(18-22\)
\(15-18.5\)
\(16-25\)
\(16-30\)
\(10-25\)
\(30-16\)
\(12-65\)
\(25-75\)

$30-18$
$20-22$
$18-24$
$10-20$ \& 60
100
100
300
70
270
32
32
32
32
60
60
300
32
300
300
300
70 \& 94
94
94
94
97
105
94
100
100
94
94
94
94
94
100
94
94
94
105

98 \& 2.5 V \& $$
\begin{array}{|l|}
\hline 0.9 \\
0.8 \\
0.7 \\
0.1 \\
0.5 \\
\\
1 \\
1 \\
1 \\
\\
\\
0.3 \\
0.3 \\
0.3 \\
0.4 \\
0.2 \\
0.2 \\
0.5 \\
0.1 \\
0.01 \\
\\
\\
\\
1
\end{array}
$$ \& 10

10
10
10
10
10
4
3
3
10
10
10
10
10
10
10
10
10
5
10

10 \&  \& | M/A |
| :--- |
| M/A |
| M/A |
| M/A |
| P/A |
| M |
| M/A |
| M/A |
| M/A |
| M/A |
| N/A |
| M/A |
| M/A |
| M/A |
| M/A |
| M/A |
| $M / A$ $M / A$ | \& No

No
No
No
Opt
No
No
No
No
No
No
No
No
No
No
Opt.
Opt.
Opt.
Opt.

Yes
Yes

Yes \&  \& \[
$$
\begin{aligned}
& \hline A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A \\
& A
\end{aligned}
$$

\] \& | Cotton |
| :--- |
| Cotton |
| Cotton |
| Velvet |
| Sim |
| Leather |
| Cotton |
| Foam |
| Foam |
| Foam |
| Foam |
| Foam |
| Foam |
| Vinyl |
| Velvet |
| Veivet |
| Vinyl |
| Velvet, |
| Leather |
| Velvet, |
| Leather |
| Foam |
| Cotton |
| Velvet | \& 4.2

4.2
4.2
9.2
5.0
3.9
2.19
2.54
4.2
4.2
4.5
4.5
7.5
83
8.8
8.8
8.8
14
9.1

1.4
5.4
6.0

11.6 \& \[
$$
\begin{array}{r}
99.00 \\
129.00 \\
149.00 \\
349.00 \\
129.00 \\
249.00 \\
49.00 \\
69.0 \\
59.00 \\
59.00 \\
79.00 \\
79.00 \\
199.00 \\
199.00 \\
19.00 \\
279.00 \\
239.00 \\
239.00 \\
1695.00 \\
12.900 . \\
\\
395.00 \\
249.00 \\
349.00 \\
1295.00
\end{array}
$$

\] \& | Active noise compensation. |
| :--- |
| Includes tube amp with volume control and D/A converter. Stereo infrared system; includes transmitter. As above. As above. Digital infrared system; includes transmitter. | <br>


\hline SONY \& | MDR-IF610K |
| :--- |
| MDR-IF410K |
| MDR-IF210K |
| MDR-E575 |
| MDR-E565 |
| MDR-Ei47 |
| NDR-E535 |
| MDR-E525 |
| MDR-E515 |
| MDR-E560G |
| MDR-E225G |
| MDR-W501L |
| MDR-W12L |
| MDR-W07L |
| MDR-A22L |
| MDR-A17G | \& Dynamic

Dynamic
Dynamic
Dynamic
Oynamic
Dynamic
Dynamic
Oynamic
Dynamic
Oynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic
Dynamic \& $18-22$
$20-20$
$18-22$
$8-26$
$10-26$
$10-23$
$16-22$
$16-22$
$12-22$
$10-23$
$18-22$
$10-24$
12.22
$18-22$
10
$12-24$
12 \& 18
18
16
16
16
16
16
16
18
16
16
16
16 \& 108
108
108
104
104
104
108
104
108
104
104
108

104 \& | 50 mW |
| :--- |
| 50 mW |
| 100 mW |
| 50 mW |
| 50 mW |
| 50 mW |
| 50 mW |
| 50 mW |
| 50 mW |
| 50 mW |
| 50 mW | \& \& 3.1

3.1
3.9
3.6
3.3
3.3
3.9
3.9
4
3.4
3.3
3.9

3.9 \& $$
\begin{aligned}
& R \\
& R \\
& R \\
& R \\
& R \\
& R \\
& R \\
& R \\
& R \\
& R \\
& R \\
& R \\
& R \\
& R \\
& R
\end{aligned}
$$ \& $A$

$M$
$M$
$M$
$M$
$M$
$M$
$M$
$M$
$M$
$M$
$M$
$M$
$M$

$M$ \&  \& \[
$$
\begin{aligned}
& \hline 0 \\
& 0 \\
& 0 \\
& 0 \\
& 1 \\
& 1 \\
& 1 \\
& 1 \\
& 1 \\
& 1 \\
& 1 \\
& 1 \\
& 1 \\
& 1 \\
& 1 \\
& 1 \\
& 1 \\
& 1
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \hline A \\
& A \\
& A \\
& A \\
& N \\
& N \\
& N \\
& N \\
& N \\
& N \\
& N \\
& N \\
& N \\
& A \\
& A \\
& A \\
& F \\
& F
\end{aligned}
$$
\] \& Foam

Foam
Famm
Plastic
Plastic
Plastic
Plastic
Plastic
Plastic
Pastic
Plastic
Plastic
Plastic
Plastic
Plastic
Plastic \& 13
7
7.4
70.2
0.2
0.2
0.2
0.2
0.2
0.2
0.2
1.1
0.7
0.4
0.7

0.6 \& \[
$$
\begin{array}{r}
199.95 \\
149.95 \\
99.95 \\
49.95 \\
39.95 \\
29.95 \\
19.95 \\
14.95 \\
9.95 \\
29.95 \\
24.95 \\
39.95 \\
16.95 \\
9.95 \\
29.95 \\
24.95
\end{array}
$$

\] \& | Infrared; cordless As above. As above. |
| :--- |
| Water resistant. As above. |
| As above. | <br>

\hline
\end{tabular}

## HEADPHONES



## DAT,DCC\&MD PLAYER/RECORDERS

| MANUFACTURER |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $s_{210} N$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| JVC | $\begin{aligned} & \text { XM-D1(RI) } \\ & \text { XDZ507TN }(R I) \\ & \text { XDZ1010TN }(R I) \end{aligned}$ | MD DAT DAT | $B$ A/B/C A/B/C | $\begin{aligned} & 2-22 \pm 0.5 \\ & 2-22 \pm 0.5 \\ & 2-22 \pm 0.5 \end{aligned}$ | $\begin{aligned} & 91 \\ & 91 \\ & 93 \\ & \hline \end{aligned}$ | $\begin{aligned} & 0.004 \\ & 0.004 \\ & 0.003 \end{aligned}$ | $\begin{aligned} & \dagger \\ & 18-8 x \\ & 18-8 x \end{aligned}$ | M/L/F LD/F M/L/D/F | L/HL/F <br> L/HU/D/F <br> LL/HLD/F | Yes <br> Yes <br> Yes | A/M/R <br> A/M/R/S/E/X <br> AM/R/E/X | $\begin{aligned} & A / B / C \\ & A / B \\ & A / B / C \end{aligned}$ | Yes Yes Yes | 1299.95 <br> 1000.00 <br> 1700.00 |  | - bit P.E.M. decoding. |
| MARANTZ | $\begin{aligned} & \mathrm{DO}-92(\mathrm{RI}) \\ & \mathrm{DD}-82(\mathrm{RI}\} \end{aligned}$ | $\begin{aligned} & \text { DCC } \\ & \text { DCC } \end{aligned}$ | $\begin{aligned} & A / B / C \\ & A / B / C \end{aligned}$ | $\begin{aligned} & 20-20 \pm 0.2 \\ & 20-20 \pm 0.2 \end{aligned}$ | $\begin{aligned} & 104 \\ & 104 \end{aligned}$ | $\begin{aligned} & 0.003 \\ & .0035 \end{aligned}$ | $\begin{aligned} & 1-64 X \\ & 1-64 X \end{aligned}$ | $\begin{aligned} & \mathrm{UD} / \mathrm{F} \\ & \mathrm{LD} / \mathrm{F} \end{aligned}$ | LL/HLD/F <br> LL/HLD/F | Yes Yes | A/M/R/S/E/X A/M/R/S/E/X | $\begin{aligned} & A / B \\ & A / B \end{aligned}$ | $\begin{aligned} & \text { No } \\ & \text { No } \end{aligned}$ | $\begin{aligned} & 699.00 \\ & 599.00 \end{aligned}$ |  | 18-bit recording and playback. As above. |
| OPTIMUS | DCT-2000(RI) | DCC | B | $5-20 \pm 0.5$ | 90 | . 0035 | 18-64X | L/D/F | U/HU/D/F | Yes | A/M/R/S/X | A | No | 500.00 |  |  |
| PHILIPS | $\begin{aligned} & \text { DCC-900(RI) } \\ & \text { OCC-130 } \\ & \text { DCC-170 } \\ & \text { DCC- } 951 \end{aligned}$ | $\begin{aligned} & \text { DCC } \\ & \text { DCC } \\ & \text { DCC } \\ & D C C \end{aligned}$ | A/B/C <br> A/B/C <br> A/B/C | $\begin{aligned} & 20-20 \pm 0.2 \\ & 5-20 \\ & 20-20 \pm 0.05 \\ & 20-20 \pm 0.05 \end{aligned}$ | $\begin{aligned} & 95 \\ & 108 \\ & 108 \\ & 108 \end{aligned}$ | $\begin{aligned} & 0.003 \\ & 0.003 \\ & 0.003 \\ & 0.003 \end{aligned}$ | $\begin{aligned} & 16- \\ & 256 x \\ & 16 \\ & 18- \\ & 192 x \\ & 18- \\ & 192 x \end{aligned}$ | UD/F <br> M/LD/F <br> M/LD/F | LL/HLID/F <br> LHLF <br> UHL/D/F <br> L/HLID | $\begin{array}{\|l} \hline \text { No } \\ \text { No } \\ \text { No } \end{array}$ | A/M/R/S/X <br> A/M/R/S/E/X <br> A/M/R/S/E/X | A/B <br> A/B <br> A/B <br> A/B | No No No No | 799.95 |  | Portable; playback only. Portable, 18-bit resolution. <br> As above. |
| SHARP | MD-M11 | MD | 8 | $20-20 \pm 3$ | 85 | 0.05 | 16-64X | M/L/F | LU/HL | Yes | A/M | A/C | Yes | 799.99 |  | Portable. |
| SONV | $\begin{aligned} & \text { DTC-690(RI) } \\ & \text { TCD-D7 } \\ & \text { WMD-DT1 } \\ & \text { MDS-101(RI) } \\ & \text { MDS-501(RI) } \\ & \text { MZ R2(RI) } \\ & \text { MZ-E2 } \end{aligned}$ | DAT <br> DAT <br> DAT <br> MD <br> MD <br> MD <br> MD | A/B/C A/B/C $\begin{aligned} & \mathrm{B} \\ & 8 \\ & \mathrm{~B} \end{aligned}$ | $\begin{aligned} & 2-20 \pm 0.5 \\ & 20-22 \pm 1 \\ & 20-22 \\ & +1-1.5 \\ & 5-20 \pm 0.3 \\ & 5-20+0.3 \\ & 20-20 \pm 1 \\ & 20-20 \pm 1 \end{aligned}$ | $\begin{aligned} & 96 \\ & 90 \\ & 90 \end{aligned}$ | $\begin{aligned} & .0045 \\ & 0.008 \\ & 0.008 \end{aligned}$ | $\begin{aligned} & 1-8 X \\ & 16.8 X \\ & 16 \end{aligned}$ | LD/F M/LD/F <br> UF UF <br> M/L/F | L/HL/F <br> UHL/F <br> HL <br> L/HL/F <br> L/HL/F <br> L/HL <br> HL | Yes | A/M/R/S/E/X A/N/S/E <br> A/M/R AM/R AM/R/X | A/B/C <br> A <br> A/B/C <br> $\mathrm{A} B / \mathrm{C}$ <br> A/B <br> A/B | Yes Yes Yes Yes Yes Yes Yes | $\begin{array}{r} 700.00 \\ 629.95 \\ 499.00 \\ 1000.00 \\ 1000.00 \\ 749.95 \\ 549.00 \end{array}$ |  | Portable. As above; playback only. <br> Date and editing functions. Jog dial for search and edit. Portable. <br> As above: playback oniy; shuftie play. |
| SONY ES | $\begin{aligned} & \text { DTC-59ES(RI) } \\ & \text { DTC-60ES(RI) } \\ & \text { DTC-2000ES(RI) } \end{aligned}$ | DAT DAT <br> DAT | A/B/C A/B/C <br> A/B/C | $\begin{aligned} & 2-20 \pm 0.5 \\ & 2-20 \pm 0.5 \\ & 2-20 \pm 0.5 \end{aligned}$ | $\begin{aligned} & 93 \\ & 94 \\ & 92 \end{aligned}$ | $\begin{aligned} & .0045 \\ & .0035 \\ & .0045 \end{aligned}$ | $\begin{aligned} & 1-8 x \\ & 1-8 x \\ & 1-8 x \end{aligned}$ | U/D/F <br> L/D/F <br> M/LD/F | LL/HUD/F LL/HL/D/F LL/HL/D/F | Ves <br> Yes <br> Ves | A/M/R/S/E/X A/M/R/S/E/X A/M/R/S/E/X | A/B/C <br> A/B/C <br> A/B/C | Yes <br> Yes <br> Yes | $\begin{array}{r} 820.00 \\ 1200.00 \\ 2500.00 \end{array}$ |  | Digital servo control. <br> Super Bit Mapping recording; <br> 44.1-kHz recording from analog. 200X/400X normal speed search; four heads for live monitor. |
| TECHNICS | $\begin{aligned} & \text { SV-DA10 } \\ & \text { RS-DC8 } \end{aligned}$ | $\begin{array}{\|l\|l\|} \text { DAT } \\ \text { DCC } \\ \hline \end{array}$ | $\begin{aligned} & A / B / C \\ & A / B \end{aligned}$ | $10 \cdot 22 \pm 0.2$ | $\begin{aligned} & 90 \\ & 95 \end{aligned}$ | 0.007 | MASH <br> MASH |  |  |  |  |  | Yes | $\begin{aligned} & 899.95 \\ & 599.95 \end{aligned}$ |  | Track search by title. |

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Oritron

Forsell
NEAR
Chang
Creek
EAD
VAC
VPI

Purist Acoustic Solutions
Alema
A.R.T.

Kuzma
Apogee Highwire Sound Lab WireWorld Blue Oasis Room Tune

Continuim Audio Symphonic Line Presence Audio Sound Anchor Eminent Tech Power Wedge Music Metre Timbre Tech First Sound

CEC Coda NSM Grado Magnum SolidSteel Parasound Monarchy Marigo Labs Omega Mikro

Micromega Brightstar Ensemble Chapman Legacy Klyne Arcici Ikeda Muse Epos

# ANALOG CASSETTE DECKS 

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline  \&  \&  \&  \&  \&  \&  \&  \&  \&  \&  \&  \&  \&  \&  \& - \&  \& - \&  \&  \\
\hline AIWA \& \[
\begin{aligned}
\& \mathrm{AD}-\mathrm{F} 850(\mathrm{RI}) \\
\& \text { AD-F450(RI) } \\
\& \text { AD-WX727 }
\end{aligned}
\] \& \[
\begin{aligned}
\& 15-21 \pm 3 \\
\& 20-19 \pm 3 \\
\& 20-18
\end{aligned}
\] \& \begin{tabular}{l}
Yes \\
No No
\end{tabular} \& \[
\begin{aligned}
\& 0.035 \\
\& 0.065 \\
\& 0.09
\end{aligned}
\] \& \[
\begin{aligned}
\& 60 \\
\& 59 \\
\& 57
\end{aligned}
\] \& \[
\begin{aligned}
\& 78 \\
\& 78 \\
\& 78
\end{aligned}
\] \& \begin{tabular}{l}
\(\mathrm{B} / \mathrm{C} / \mathrm{H}\) \\
B/C/H \\
\(\mathrm{B} / \mathrm{C} / \mathrm{H}\)
\end{tabular} \& \begin{tabular}{l}
AM \\
A/M A
\end{tabular} \& \[
\begin{aligned}
\& 3 \\
\& \\
\& 3 \\
\& 3
\end{aligned}
\] \& \begin{tabular}{l}
Yes \\
Yes Yes
\end{tabular} \& \begin{tabular}{l}
No \\
No Yes
\end{tabular} \& \begin{tabular}{l}
P/PH \\
\(\mathrm{P} / \mathrm{PH}\) \\
P/PH
\end{tabular} \& \[
\begin{aligned}
\& E / R \\
\& T \\
\& T
\end{aligned}
\] \& \begin{tabular}{l}
No \\
No Yes
\end{tabular} \& \[
\begin{aligned}
\& 0 \\
\& 0 \\
\& 0
\end{aligned}
\] \& \begin{tabular}{l}
No \\
No Yes
\end{tabular} \& \[
\begin{aligned}
\& 10 \\
\& 8 \\
\& 11
\end{aligned}
\] \& \[
\begin{aligned}
\& 400.00 \\
\& \\
\& 250.00 \\
\& 300.00
\end{aligned}
\] \& Dual capstan; record calibration. Logic controls. Anti-modulation tape stabilizer. \\
\hline ARCAM \& Delta 100(R0) \& \(20-20 \pm 3\) \& \& 0.07 \& 66 \& 88 \& B/C/S \& M \& 3 \& No \& No \& PH \& E \& No \& 0 \& No \& 17 \& 1800.00 \& \\
\hline BANG \& OLUFSEN \& Beocord 7000 \& 30-18 \(\pm 3\) \& No \& 0.09 \& 55 \& 74 \& B/C/H \& A \& 3 \& Yes \& No \& P/PH \& T \& Yes \& 1 \& No \& 18 \& 1250.00 \& \\
\hline CARVER \& TDR-1550(RI) \& 40-19 \(\pm 3\) \& No \& 0.06 \& \& 73 \& B/C/H \& M \& 3 \& Yes \& No \& P \& E \& Yes \& 0 \& No \& 12 \& 500.00 \& CD sync. \\
\hline DENON \& \begin{tabular}{l}
DRW-840 \\
DRW-660 \\
DRR-730 \\
DRS-810 \\
DRM-740(RO) \\
DRS-640(RO) \\
DRM-540
\end{tabular} \& \[
\begin{aligned}
\& 20-18 \pm 3 \\
\& 20-18 \pm 3 \\
\& 20-19 \pm 3 \\
\& 20-20 \pm 3 \\
\& 20-20 \pm 3 \\
\& 25-18 \pm 3 \\
\& 25-18 \pm 3 \\
\& \hline
\end{aligned}
\] \& \begin{tabular}{l}
No \\
No \\
No \\
Yes \\
Yes \\
No \\
No
\end{tabular} \& 0.06
0.07
0.06
0.038
0.038
0.055
0.055 \& \& \begin{tabular}{l}
74 \\
74 \\
74 \\
75 \\
75 • \\
74 \\
74
\end{tabular} \& \begin{tabular}{l}
\(\mathrm{B} / \mathrm{C} / \mathrm{H}\) \\
\(\mathrm{B} / \mathrm{C} / \mathrm{H}\) \\
B/C/H \\
\(\mathrm{B} / \mathrm{C} / \mathrm{H}\) \\
\(\mathrm{B} / \mathrm{C} / \mathrm{H}\) \\
B/C/H \\
\(\mathrm{B} / \mathrm{C} / \mathrm{H}\)
\end{tabular} \& \[
\begin{aligned}
\& \mathrm{M} \\
\& \mathrm{M} \\
\& \mathrm{M} \\
\& \mathrm{M} \\
\& \mathrm{M} \\
\& \mathrm{M} \\
\& \mathrm{M}
\end{aligned}
\] \& \begin{tabular}{l}
3 \\
3 \\
\begin{tabular}{l}
3 \\
3 \\
\hline
\end{tabular} \\
\begin{tabular}{l}
3 \\
3 \\
3 \\
\hline
\end{tabular}
\end{tabular} \& \begin{tabular}{l}
Yes \\
Yes \\
Yes \\
Yes \\
Yes \\
Yes \\
Yes
\end{tabular} \& \begin{tabular}{l}
No \\
No \\
No \\
No \\
No \\
No \\
No
\end{tabular} \& \[
\begin{aligned}
\& \mathrm{P} \\
\& \mathrm{P} \\
\& \mathrm{P} \\
\& \mathrm{P} / \mathrm{PH} \\
\& \\
\& \mathrm{P} / \mathrm{PH} \\
\& \mathrm{P} \\
\& \mathrm{D}
\end{aligned}
\] \& \begin{tabular}{l}
T \\
T \\
T \\
E/R \\
E/R \\
\(E R\) \\
T
\end{tabular} \& \begin{tabular}{l}
Yes \\
Yes \\
Yes No \\
No No No
\end{tabular} \& \begin{tabular}{l}
0 \\
0 \\
0 \\
0
0
0
\end{tabular} \& \begin{tabular}{l}
Yes \\
Yes \\
No \\
No \\
No \\
No \\
No
\end{tabular} \& 11
12 \& \[
\begin{aligned}
\& 400.00 \\
\& \\
\& 300.00 \\
\& 300.00 \\
\& 500.00 \\
\& \\
\& 400.00 \\
\& 300.00 \\
\& 250.00
\end{aligned}
\] \& \begin{tabular}{l}
High-speed dubbing; twin and relay record; relay play. High-speed dubbing; relay play. \\
Horizontal loading; dual capstan. \\
CD sync.
\end{tabular} \\
\hline DUAL \& CC 5850 RC(RI) • CC 8065 RC(RI) \& \[
\begin{array}{r}
25-19 \\
25-15
\end{array}
\] \& Yes
Yes \& \[
\begin{aligned}
\& 0.05 \\
\& 0.06 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 65 \\
\& 65 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 75 \\
\& 73 \\
\& \hline
\end{aligned}
\] \& \begin{tabular}{l}
\(B / C / H\) \\
\(B / C / H\)
\end{tabular} \& \[
\begin{array}{|l}
\hline \mathrm{A} \\
\mathrm{~A} \\
\hline
\end{array}
\] \& \& Yes \& \& \[
\begin{aligned}
\& \mathrm{PH} \\
\& \mathrm{PH}
\end{aligned}
\] \& \[
\begin{aligned}
\& \mathrm{E} / \mathrm{R} \\
\& \mathrm{E} / \mathrm{R} \\
\& \hline
\end{aligned}
\] \& \& \& \& \[
\begin{aligned}
\& 13 \\
\& 12 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 505.00 \\
\& 440.00
\end{aligned}
\] \& Two motors. As above. \\
\hline Elite \& \begin{tabular}{l}
CT-43 \\
CT-W54
\end{tabular} \& \begin{tabular}{l}
15-21 \\
20-19
\end{tabular} \& Yes \& \[
\begin{aligned}
\& 0.023 \\
\& 0.08
\end{aligned}
\] \& 60 57 \& 79 \& \begin{tabular}{l}
B/C/ \\
S/H \\
B/C/ \\
S/H
\end{tabular} \& \begin{tabular}{l}
A \\
A
\end{tabular} \& \& Yes \& No \& \[
\begin{aligned}
\& \mathrm{A} P \mathrm{PH} \\
\& \mathrm{PH}
\end{aligned}
\] \& \[
\begin{aligned}
\& \mathrm{E} / \mathrm{R} \\
\& \mathrm{E}
\end{aligned}
\] \& \begin{tabular}{l}
Yes \\
Yes
\end{tabular} \& \[
\begin{aligned}
\& 0 \\
\& 1
\end{aligned}
\] \& No Yes \& 16 \& \begin{tabular}{l}
650.00 \\
475.00
\end{tabular} \& \\
\hline FISHER \& CRW983 CRW683 \& \[
\begin{aligned}
\& 50-17 \pm 3 \\
\& 50-15 \pm 3
\end{aligned}
\] \& Yes Yes \& \[
\begin{aligned}
\& 0.12 \\
\& 0.18
\end{aligned}
\] \& \[
\begin{aligned}
\& 54 \\
\& 54
\end{aligned}
\] \& \[
\begin{aligned}
\& 70 \\
\& 62
\end{aligned}
\] \& \[
{ }_{\mathrm{B}}^{\mathrm{B} / \mathrm{C} / \mathrm{H}}
\] \& \[
\begin{aligned}
\& A \\
\& A
\end{aligned}
\] \& \[
\begin{aligned}
\& 3 \\
\& 3
\end{aligned}
\] \& Yes
No \& No
No \& \[
\begin{aligned}
\& \mathrm{P} \\
\& \mathrm{P}
\end{aligned}
\] \& \[
\begin{aligned}
\& \mathrm{E} \\
\& \mathrm{E}
\end{aligned}
\] \& Yes
Yes \& \[
\begin{aligned}
\& 0 \\
\& 0
\end{aligned}
\] \& Yes Yes \& \[
\begin{aligned}
\& 9 \\
\& 9
\end{aligned}
\] \& \[
\begin{aligned}
\& 179.95 \\
\& 129.95
\end{aligned}
\] \& High-speed dubbing. As above. \\
\hline HARMAN KARDON \& \[
\begin{aligned}
\& \text { TD420 } \\
\& \\
\& \text { TD4200 } \\
\& \text { TD4400 } \\
\& \text { DC5300 }
\end{aligned}
\] \& \[
\begin{aligned}
\& 20-19 \pm 3 \\
\& 20-20 \pm 3 \dagger \\
\& 20-20 \pm 3 \dagger \\
\& 20-18 \pm 3
\end{aligned}
\] \& \begin{tabular}{l}
No \\
No No No
\end{tabular} \& \[
\begin{aligned}
\& 0.06 \\
\& \\
\& 0.05 \\
\& 0.05 \\
\& 0.06
\end{aligned}
\] \& \[
\begin{aligned}
\& 56 \\
\& 57 \\
\& 57 \\
\& 57
\end{aligned}
\] \& \[
\begin{aligned}
\& 73 \\
\& 73 \\
\& 73 \\
\& 73
\end{aligned}
\] \& \begin{tabular}{l}
\[
\mathrm{B} / \mathrm{C} / \mathrm{H}
\] \\
B/C B/C/H B/C
\end{tabular} \& \[
\begin{aligned}
\& \mathrm{M} \\
\& \mathrm{M} \\
\& \mathrm{M} \\
\& \mathrm{M}
\end{aligned}
\] \& \[
\begin{array}{|l|}
\hline 3 \\
3 \\
3 \\
3
\end{array}
\] \& Yes
No
- No
No \& \begin{tabular}{l}
Yes \\
No \\
Yes \\
No
\end{tabular} \& \[
\begin{aligned}
\& \mathrm{PH} \\
\& \mathrm{P} \\
\& \mathrm{P} \\
\& \mathrm{P}
\end{aligned}
\] \& E \(E\)
\(E\)
\(E\) \& \begin{tabular}{l}
No \\
No \\
No Yes
\end{tabular} \& \[
\begin{aligned}
\& 0 \\
\& 0 \\
\& 0 \\
\& 0 \\
\& 0
\end{aligned}
\] \& \begin{tabular}{l}
No \\
No No Yes
\end{tabular} \& \[
\begin{aligned}
\& 10 \\
\& 12 \\
\& 12 \\
\& 17
\end{aligned}
\] \& \[
\begin{aligned}
\& 359.00 \\
\& 349.00 \\
\& 469.00 \\
\& 569.00
\end{aligned}
\] \& \begin{tabular}{l}
\(\dagger\) At 0 VU. \\
One-touch normal and high-speed dubbing; sync dub with auto reverse.
\end{tabular} \\
\hline JVC \& \begin{tabular}{l}
TDV1050TN \\
TDV661TN \\
TDR46ITN \\
TDW709TN \\
TDW309TN \\
TDW209TN \\
TDW315TN \\
TDW215TN
\end{tabular} \& \[
\begin{array}{|l}
10-23 \\
10-21 \\
20-17 \\
20-17 \\
20-17 \\
20-17 \\
20-17 \\
20-17 \\
\hline
\end{array}
\] \& \begin{tabular}{l}
Yes \\
Yes \\
No \\
No \\
No \\
No \\
No \\
No
\end{tabular} \& \[
\begin{aligned}
\& 0.022 \\
\& 0.035 \\
\& 0.08 \\
\& 0.08 \\
\& 0.08 \\
\& 0.08 \\
\& 0.08 \\
\& 0.08 \\
\& \hline
\end{aligned}
\] \& \[
\begin{aligned}
\& 61 \\
\& 59 \\
\& 58 \\
\& 58 \\
\& 58 \\
\& 58 \\
\& 58 \\
\& 58 \\
\& \hline
\end{aligned}
\] \& \& \(\mathrm{B} / \mathrm{C} / \mathrm{H}\) \(\mathrm{B} / \mathrm{C} / \mathrm{H}\) B/C/H \(\mathrm{B} / \mathrm{C} / \mathrm{H}\) \(\mathrm{B} / \mathrm{C} / \mathrm{H}\) B/C/H B/C/H B/C/H \& \begin{tabular}{l}
AMM \\
A/M \\
AM \\
A \\
A \\
A \\
A \\
A
\end{tabular} \& \[
\begin{array}{|l|}
\hline 3 \\
3 \\
3 \\
3 \\
3 \\
3 \\
3 \\
3 \\
\hline
\end{array}
\] \& \begin{tabular}{l}
Yes \\
Yes \\
Yes \\
Yes \\
Yes \\
No \\
Yes \\
No
\end{tabular} \& \begin{tabular}{l}
No \\
No \\
No \\
No \\
No \\
No \\
No \\
No
\end{tabular} \& \[
\begin{aligned}
\& \text { A/PH } \\
\& \text { A/PH } \\
\& \text { A/PH } \\
\& \text { A } \\
\& \text { A } \\
\& \text { A } \\
\& \text { A } \\
\& \text { A } \\
\& \hline
\end{aligned}
\] \& \[
\begin{array}{|l}
\hline E / R \\
E \\
E \\
E \\
T \\
T \\
E \\
E \\
\hline
\end{array}
\] \& No No Yes Yes Yes Yes Yes No \& \[
\begin{array}{|l|}
\hline 0 \\
0 \\
0 \\
1 \\
1 \\
0 \\
0 \\
0 \\
\hline
\end{array}
\] \& \begin{tabular}{l}
No \\
No \\
No \\
Yes \\
Yes \\
Yes \\
Yes \\
Yes
\end{tabular} \& \[
\begin{array}{|l|}
\hline 17 \\
12 \\
10 \\
12 \\
11 \\
11 \\
11 \\
11 \\
\hline
\end{array}
\] \& \[
\begin{aligned}
\& 700.00 \\
\& 419.95 \\
\& 279.95 \\
\& 349.95 \\
\& 279.95 \\
\& 229.95 \\
\& 259.95 \\
\& 199.95 \\
\& \hline
\end{aligned}
\] \& \\
\hline KENWOOD \& \[
\begin{aligned}
\& K X-W 8060 \\
\& \\
\& K X-W 6060 \\
\& K X-W 4060 \\
\& K X-W 1060
\end{aligned}
\] \& \[
\begin{aligned}
\& 20-18 \\
\& \\
\& \\
\& 30-17 \\
\& 30-17 \\
\& 30-13 \\
\& \hline
\end{aligned}
\] \& Yes

Yes
Yes

Yes \& $$
\begin{aligned}
& 0.06 \\
& \\
& \\
& 0.08 \\
& 0.08 \\
& 0.3 \\
& \hline
\end{aligned}
$$ \& 57

$$
\begin{aligned}
& 58 \\
& 58 \\
& 57 \\
& \hline
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& 65 \\
& \\
& 67 \\
& 67 \\
& 66 \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \mathrm{B} / \mathrm{C} / \mathrm{H} \\
& \\
& \mathrm{~B} / \mathrm{C} / \mathrm{H} \\
& \mathrm{~B} / \mathrm{C} / \mathrm{H} \\
& \mathrm{~B} \\
& \hline
\end{aligned}
$$

\] \& | A |
| :--- |
| AM | \& \& | Yes |
| :--- |
| Yes |
| Yes | \& | Yes |
| :--- |
| Yes |
| Yes | \& \[

$$
\begin{aligned}
& \text { A/P } \\
& \text { A/P } \\
& \text { A/P } \\
& \text { A/P }
\end{aligned}
$$

\] \& E/R \& | Yes |
| :--- |
| Yes Yes | \& \[

$$
\begin{aligned}
& 0 \\
& \\
& 0 \\
& a \\
& 0 \\
& 0
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \text { Yes } \\
& \\
& \text { Yes } \\
& \text { Yes } \\
& \text { Yes }
\end{aligned}
$$

\] \& \[

11
\]

$$
\begin{aligned}
& 9 \\
& 9 \\
& 9
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& 329.00 \\
& \\
& 239.00 \\
& 229.00 \\
& 119.00 \\
& \hline
\end{aligned}
$$
\] \& High-speed dubbing; simultaneous recording in both wells; timer record and play. High-speed dubbing. As above. <br>

\hline LUXMAN \& K-373 \& 15-20 $\pm 3$ \& Yes \& 0.045 \& 58 \& 74 \& B/C/H \& AM \& 3 \& Yes \& Yes \& P \& E/R \& No \& 2 \& No \& 17 \& 750.00 \& <br>

\hline MARANTZ \& $$
\begin{aligned}
& \text { SD-72(RI) } \\
& \text { SD-725(RI) } \\
& \text { SD-63(RI) } \\
& \text { SD-535(RI) } \\
& \text { SD-1020(RI) }
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& 15-21 \pm 3 \\
& 20-19 \pm 3 \\
& 20-19 \pm 3 \\
& 20-18 \pm 3 \\
& 20-18 \pm 3 \\
& \hline
\end{aligned}
$$
\] \& Yes

No
Yes
No

No \& $$
\begin{aligned}
& \hline 0.03 \\
& 0.06 \\
& 0.05 \\
& 0.06 \\
& \\
& 0.06 \\
& \hline
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& 62 \\
& 60 \\
& 58 \\
& 58 \\
& 58 \\
& \hline
\end{aligned}
$$

\] \& \&  \& | M |
| :--- |
| M | \& \[

3
\]

$$
\begin{aligned}
& 3 \\
& 3 \\
& 3
\end{aligned}
$$

\[
3

\] \& | Yes |
| :--- |
| Yes |
| No |
| No |
| No | \& \[

$$
\begin{aligned}
& \text { Yes } \\
& \text { Yes } \\
& \text { No } \\
& \text { Yes } \\
& \text { Yes }
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \mathrm{PH} \\
& \\
& \mathrm{PH} \\
& \mathrm{PH} \\
& \mathrm{~A} \\
& \mathrm{~A} \\
& \hline
\end{aligned}
$$
\] \& $T / E$

$T / E$
$T / E$
$T / E$

$T / E$ \& \[
$$
\begin{array}{|l|}
\hline \text { No } \\
\text { Yes } \\
\text { No } \\
\text { Yes } \\
\text { Yes } \\
\hline
\end{array}
$$

\] \& \& \[

$$
\begin{array}{|l|}
\hline \text { No } \\
\text { Yes } \\
\text { No } \\
\text { Yes } \\
\text { No } \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{array}{r}
23 \\
21 \\
18 \\
14 \\
14 \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 599.00 \\
& \\
& 599.00 \\
& 349.00 \\
& 349.00 \\
& 349.00 \\
& \hline
\end{aligned}
$$

\] \& | Dual capstan; three inputs. Recording in both wells. |
| :--- |
| Auto reverse in both wells. | <br>

\hline NAD \& 602 \& $35-16 \pm 3$ \& No \& 0.06 \& 56 \& 66 \& B/C \& No \& 3 \& No \& No \& P \& T \& No \& 0 \& No \& 10 \& 299.00 \& <br>

\hline NAKAMICH: \& $$
\begin{aligned}
& \text { DR-1(R0) } \\
& \text { DR-2(RO) } \\
& \text { DR-3(RO) } \\
& \hline
\end{aligned}
$$ \& \[

$$
\begin{aligned}
& 20-21 \pm 3 \\
& 20-21 \pm 3 \\
& 20-20 \pm 3 \\
& \hline
\end{aligned}
$$

\] \& | Yes |
| :--- |
| Yes |
| No | \& \[

$$
\begin{aligned}
& 0.06 \\
& 0.06 \\
& 0.11 \\
& \hline
\end{aligned}
$$

\] \& \& \[

$$
\begin{array}{|l|}
\hline 72 \\
72 \\
70 \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& B / C \\
& B / C \\
& B / C \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& \mathrm{M} \\
& \mathrm{M} \\
& \mathrm{M} \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 3 \\
& \\
& 3 \\
& 3 \\
& \hline
\end{aligned}
$$

\] \& | No |
| :--- |
| No No | \& | No |
| :--- |
| No |
| No | \& \[

$$
\begin{array}{|l}
\mathrm{P} \\
\mathrm{P} \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{array}{|l}
\hline T \\
T \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{array}{|l}
\text { No } \\
\text { No } \\
\text { No } \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{array}{|l|}
\hline 0 \\
0 \\
0 \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& \text { No } \\
& \text { No } \\
& \text { No } \\
& \hline
\end{aligned}
$$

\] \& \[

$$
\begin{array}{r}
13 \\
13 \\
12 \\
\hline
\end{array}
$$

\] \& \[

$$
\begin{aligned}
& 929.00 \\
& 749.00 \\
& 429.00 \\
& \hline
\end{aligned}
$$
\] \& Manual playback azimuth adjustment. <br>

\hline ONKYO \& | TA-201(RO) |
| :--- |
| TA-R30 $\dagger$ (RO) |
| TA-R401(RI) |
| TA-RW313 |
| TA-RW414 |
| TA-RW505 |
| Integra |
| TA-RW909 | \& \[

$$
\begin{aligned}
& 30-18 \pm 3 \\
& 30-18 \pm 3 \\
& 30-18 \pm 3 \\
& 30-16 \pm 3 \\
& 30-16 \pm 3 \\
& 20-17 \\
& 20-17
\end{aligned}
$$

\] \& | No |
| :--- |
| No |
| No |
| No |
| No |
| Yes |
| Yes | \& \[

$$
\begin{aligned}
& 0.07 \\
& 0.07 \\
& 0.07 \\
& 0.07 \\
& 0.07 \\
& 0.065 \\
& 0.065
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 58 \\
& 58 \\
& 58 \\
& 58 \\
& 58 \\
& 58 \\
& 58
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 78 \\
& 78 \\
& 78 \\
& 78 \\
& 78 \\
& 78 \\
& 78
\end{aligned}
$$

\] \& B/C/H B/C/H $\mathrm{B} / \mathrm{C} / \mathrm{H}$ $\mathrm{B} / \mathrm{C} / \mathrm{H}$ B/C/H B/C/H $\mathrm{B} / \mathrm{C} / \mathrm{H}$ \&  \& \[

$$
\begin{array}{|l|}
\hline 3 \\
3 \\
3 \\
3 \\
3
\end{array}
$$

\] \& | No |
| :--- |
| No |
| Yes |
| No |
| Yes |
| Yes |
| Yes | \& | No |
| :--- |
| No |
| Yes |
| No |
| No |
| No |
| No | \& | PH |
| :--- |
| PH |
| PH |
| P |
| P |
| A/P |
| A/PH | \& $T$

$T$
$E / R$
$T$
$E / R$
$T$

$E / R$ \& $$
\begin{aligned}
& \text { No } \\
& \text { Yes } \\
& \text { Yes } \\
& \text { Yes } \\
& \text { Yes } \\
& \text { Yes } \\
& \text { Yes }
\end{aligned}
$$ \& 0

0
0
0
0
0
0

4 \& | No |
| :--- |
| No |
| No |
| Yes |
| Yes |
| Yes |
| Yes | \& \[

$$
\begin{aligned}
& 11 \\
& 11 \\
& 11 \\
& 12 \\
& 13 \\
& 13 \\
& 18
\end{aligned}
$$

\] \& \[

$$
\begin{aligned}
& 250.00 \\
& 300.00 \\
& 385.00 \\
& 250.00 \\
& 355.00 \\
& 410.00 \\
& 710.00
\end{aligned}
$$

\] \& | CD sync. |
| :--- |
| As above. |
| As above; two motors. High-speed dubbing. Recording in both wells. |
| Record and quick reverse in both wells; separate power supply; power loading. | <br>

\hline
\end{tabular}

## ANALOG CASSETTE DECKS


 sustems matcr ed to the individual shapes and cortours of the car interior. Whict means our AM/FM dual CD/こassette sustem is kind of like a voice that's born with the car.

# BLANK TAPES \& DISCS 



# BLANK TAPES \& DISCS 



## TRUE SUBWOOFERS

With phenomenal true deep bass extending below 20 Hz with low distortion at a very affordable price. The HRSW10s and the HRSW12Vs will extend the bass of your stereo or video system for that "air shaking all around you" effect. Here's what the experts are saying:

"Once you have heard what they can add to
your system, you won't want to part with
them. Ecstatically recommended!"
Gerald D. Burt, Sensible Sound, Issue No. 49, Fall 1993
"If you have a listening room of reasonable size, nothing can improve your stereo system as dramatically for $\$ 750$ as the Hsu Research HRSW10"
Pete Aczel, The Audio Critic, Issue No. 19, Spring 1993
"I guarantee you this much; once you hear good clean bass, you'll be hooked for life. Highly recommended"

Dick Oshler, Stereophile, Vol. 16 No. 3, March 1993
"Truly awesome room shaking bass... $+0,-3 \mathrm{~dB} 14.3$ to 40 Hz " Don Keele, Audio 11/92
"Most effective subwoofer we have tested ... Best Buy" Julian Hirsch, Stereo Review 9/92
"Bass extension was truly remarkable"
Roben Deutsch, Stereophile Vol. 15 No. 4, April 1992
"Delivered clean low bass at high levels ... work just splendidly" David Moran, Speaker Builder 3/92
"Some of the most impressive subwoofer systems l've heard" Peter Mitchell, Stereophile Vol. 14 No. 3, March 1991

"One of the most effective subwoofer demonstrations"
Gary Reber, Widescreen Review Vol. 3 No. 1. March 1994
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## EQUALIZERS



# Making Good Stereo Sound Better 

## .. . but we are not the only ones who think this ...

66 Our test and use of the AudioControl C-101 Series III left no doubt that it would be a first rate addition to any good audio system. Used wisely it can only improve the final sound. 99

Julian Hirsch, Stereo Review, July 1994


I'm impressed by how little distortion and noise the $\mathbf{C - 1 0 1}$ produces it is outstanding in these regards. 99

Edward Foster, Audio, August 1994

## Audiocontrol <br> making good stereo sound better

## EQUALIZERS



## Nice Rear.



## CD, Tuner; 2 Audio Tape Loops, 2 VCR Tape Loops, Laser Disc, Video Iuputs, Sub woofer crossover; 6 Cbamels of ontput with individual adjustment. What a reart Take a look at the rest.

ponent netessary to put exgether a great Home Theater. Then we designed a remore control, so simple, that eyen your parents could use it. We took a look a: those super theater systems and built in some of the same professional features like Sound Pressure Level (SPL) matching.

We added specifically-designed amplifiers and a powered sub woofer: small yet powerwl enough to ramle your windows. Together these components are called System 2. We think our 25 years of passion and expenience paid off.
Here are a few serious design reasons why our System 2 should be your Home Theater choice.

1. System Building Flexibility so unusual it guarantees your long tem enterainment needs are met no mater how many components you bus:
2. Exceptional Audiophile Circuits offering high resolution (clear sound) with a dvnamic ange of greater than 115 dB (Enough to play the 181 ? Overture loud)
3. Dolby Time Link Technology recently parented plus newdy developed nicro processors for seering sound effects to your speakers.
4. Dynamic Range Greater Thar: 100 dB in Pro Logic combined with our Dolly: circuir's super low distorion flisten to the center channel speaker) the chynamics are immodiately felt.
5. Disributed Power using two audiophile quality amplifiets celivering 270 walls across your three font speakers with 45 walts for each surround speakers.
6. Low Distortion Bass delivered by our powered sub woofer using our unique Vegative Output Impedance Amplifier circuit produces cleara bass response down to 30 Hz . © 102 dB .
7. Matching Sound Pressure Level Exactiy for all six speakers is practically automatic using our external microphone and buitin SPI. meter

There's so much more to cover why not go down to your nearest AhC Deaker and bring vour favcrite movie or give us a call direct, at 1-800-321-6396. Find our for yourself wizat our System 2 is all about and
...check out our rear.

## AMC



System 2

TET. 818-99-33\% FAN 818-79-654!

| MATRIX CODE <br> A-Ambisonics D-Dolby Surround DP-Dolby Pro Log THX -THX Certified DM-Dynaco Matrix SQ-SO 0 -Other |  |  |  |  | UNIT <br> TYPE |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ACURUS | ACT 1 | DP | D |  | 3F, 2B, SW | 5-40 | 3 |  |  |  |  |  | No | 1 | Yes | 899.00 |  |  |
| ADCOM | $\begin{aligned} & \text { GSP-560(RI) } \\ & \text { GTP-550(RI) } \\ & \text { GTP-600(RI) } \end{aligned}$ | DP/0 <br> DP/0 <br> DP/0 | $\begin{aligned} & D / R \\ & D / R \\ & D / R \end{aligned}$ | F/P/O <br> F/P/O <br> F/P/O | $\begin{aligned} & 3 F, 2 B, S W \\ & 3 F, 2 B, S W \\ & 3 F, 2 B, S W \end{aligned}$ | $\begin{aligned} & 40-15 \\ & 15-100 \\ & 15 \cdot 100 \end{aligned}$ | $\begin{aligned} & 3 \\ & 3 \\ & 3 \end{aligned}$ |  | $\begin{aligned} & 80 \times 1 \\ & 40 \times 2 \end{aligned}$ | $\left\lvert\, \begin{aligned} & 0.09 \\ & 0.005 \\ & 0.005 \end{aligned}\right.$ | $\begin{aligned} & 100 \\ & 95 \\ & 95 \end{aligned}$ |  | Yes <br> Yes <br> Yes | $\begin{aligned} & 1 \\ & 4 \\ & 4 \end{aligned}$ | No <br> Yes <br> Yes | $\begin{array}{r} 600.00 \\ 800.00 \\ 1000.00 \end{array}$ |  | tuner/preamp (see also "Tuners" and reamps"). <br> above; $S$-video and composite-video uts. |
| AMC | Pro 7 | DP | D | 0 | 3F, 2B, SW |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ARCAM | Theta One(Ri) | DP/0 |  |  | $\dagger$ |  | 1 |  | $\begin{aligned} & 50 \times 2 \\ & 25 \times 3 \end{aligned}$ |  |  |  | No | 2 | 4 | 1900.00 |  | by 3 Stereo; S-video and compositeeo in and out. tLine, $3 F, 2 S$, and $S W$; eaker, 3 F and 2 S . |
| AUDIO DESIGN ASSOCIATES | $\begin{array}{\|l\|} \hline \text { SSD-66 } \\ \text { SSD-66THX } \end{array}$ | $\begin{aligned} & \text { DP } \\ & \text { DP/THX } \end{aligned}$ | $0$ |  | $\begin{aligned} & 3 F, 2 B, S W \\ & 3 F, 2 B, S W \end{aligned}$ | $\begin{aligned} & 0.40 \\ & 0.97 .5 \\ & \hline \end{aligned}$ | 6 |  |  | $\begin{array}{\|l\|} \hline 0.03 \\ 0.003 \\ \hline \end{array}$ |  | $\begin{aligned} & 35 \\ & 35 \\ & \hline \end{aligned}$ | Yes Yes |  |  | $\begin{array}{\|l\|} \hline 1799.00 \\ 2999.00 \\ \hline \end{array}$ |  |  |
| AUDIOFILE HOME THEATER | MTVS-1(RI) | DP | D |  | $3 \mathrm{~B}, \mathrm{SW}$ | 30-50 | 4 | V | $30 \times 3$ | 0.5 | 90 |  | Yes | 1 | Yes | 229.99 |  |  |
| AUDIOSOURCE | SS-Three Series II(RI) SS-Four(RI) | DP DP | D <br> D | C/P <br> C/P | $\begin{aligned} & 3 F, 2 B, S W \\ & 3 F, 2 B, S W \end{aligned}$ | $\begin{aligned} & 20 \text { or } 30 \\ & 30 \text { or } 50 \end{aligned}$ | 2 <br> 2 |  | $\begin{array}{r} 30 \times 2 \\ 24 \times 2 \\ \hline \end{array}$ |  | $\begin{aligned} & 90 \\ & 90 \end{aligned}$ | $\begin{aligned} & 54 \\ & 54 \end{aligned}$ | Yes <br> Yes | 1 1 | No <br> No | $\begin{aligned} & 349.95 \\ & 299.95 \\ & \hline \end{aligned}$ |  | With AudioSource VS-One center-channel peaker, LS Ten/A surround speakers, and able, \$479.95 (SS-3001 System) s above but $\$ 429.95$ (SS-4001 System). |
| BANG \& OLUFSEN | AV-7000 | DP |  | 0 | 3F. 2B, SW | 20.4 |  |  | $\dagger$ | 0.2 |  |  | No |  | Yes | 1999.00 |  | Center, 45 watts. Operated by B \& 0 eolink 1000 audio system remote; allows able converter and video equipment be controlled by Beolink 1000. |
| $\begin{aligned} & \text { B \&K } \\ & \text { COMPONENTS } \end{aligned}$ | AVP1000(RI) <br> AVP2000(RI) <br> AVP3000(RI) | DP <br> DP <br> DP/O | $\begin{aligned} & \mathrm{D} \\ & \mathrm{D} \\ & \mathrm{D} \end{aligned}$ |  | 3F, 2B, SW <br> 3F, 2B, SW <br> 3F, 2B, SW | $\begin{aligned} & 1-130 \\ & 1-130 \\ & 1-130 \end{aligned}$ | $\begin{aligned} & 8 \\ & 8 \\ & 8 \end{aligned}$ | $\begin{aligned} & v \\ & v \\ & v \end{aligned}$ |  | $\begin{aligned} & 0.02 \\ & 0.02 \\ & 0.02 \end{aligned}$ | $\begin{aligned} & 89 \\ & 89 \\ & 89 \end{aligned}$ | 70 70 70 | No <br> No <br> Yes | 2 2 2 | $\begin{aligned} & 4 \\ & 7 \\ & 7 \end{aligned}$ | $\begin{array}{r} 998.00 \\ 998.00 \\ 1498.00 \end{array}$ |  | W tuner/preamp (see also "Tuners" and Preamos"); balanced outputs. wo-zone AN preamp (see also Preamps"); balanced outputs. s above; cinema surround. |
| CARVER | $\begin{aligned} & \mathrm{C}-20 \mathrm{~V}(\mathrm{RI}) \\ & \mathrm{C}-15 \mathrm{~V}(\mathrm{RI}) \\ & \mathrm{CT}-27 \mathrm{~V}(\mathrm{RI}) \\ & \mathrm{CT}) \\ & \mathrm{CMV}(\mathrm{RI}) \\ & (\mathrm{RI}) \\ & \mathrm{CPL}-1185 \\ & \hline \end{aligned}$ | $D / D P / 0$ $D / D P / 0$ $D / D P / 0$ $D / D P / 0$ $D / D P / 0$ $D / D P / 0$ | $\begin{aligned} & D / R \\ & D / R \\ & D / R \\ & D / R \\ & D / R \\ & 0 \\ & \hline \end{aligned}$ | F/C/P/O <br> F/C/P/0 <br> F/C/P/O <br> F/C/P/O <br> F/C/P/0 <br> P/O | $3 F, 2 B$ $3 F, 2 B, S W$ $3 F, 2 B, S W$ $3 F, 2 B, S W$ $3 F, 2 B, S W$ $3 F, 2 B, S W$ | $\begin{aligned} & 0-90 \\ & 0-90 \\ & 0-90 \\ & 0-90 \\ & 0-90 \\ & 20 \text { of } 30 \\ & \hline \end{aligned}$ | 2 <br> 2 <br> 2 <br> 2 <br> 1 <br> 2 | $\begin{aligned} & \mathrm{S} \\ & \mathrm{~S} \\ & \mathrm{~S} \\ & \mathrm{~S} \\ & \mathrm{~S} \end{aligned}$ | $\begin{aligned} & 80 \times 2 \\ & 90 \times 1 \\ & 35 \times 2 \end{aligned}$ | 0.01 0.01 0.01 0.01 0.01 0.5 | $\begin{aligned} & 80 \\ & 85 \\ & 85 \\ & 85 \\ & 85 \\ & 80 \\ & \hline \end{aligned}$ | 75 75 75 75 50 30 | Yes <br> Yes <br> Yes <br> Yes <br> Yes <br> Yes | 4 4 4 4 4 2 1 | Yes Yes Yes Yes Yes No | 1000.00 800.00 850.00 1200.00 850.00 300.00 |  | N preamp (see also "Preamps"); DSP; n-screen TV display. <br> $W$ multi-room preamp (see also Preamps"); DSP; center-channel gain ontrol. <br> N tuner/preamp (see also "Tuners" and Preamps"); DSP; center-channel gain ontrol. <br> as above; multi-room; on-screen TV display. <br> N amp (see also "Amps"); centerhantrel gain control. |
| CHASE <br> TECHNOLOGIES | HTS-1 | 0 |  |  | 3F, 2 B |  |  |  |  |  |  | 50 | No |  |  | 99.95 |  | assive surround matrix; center-channel ne output; surround line and speaker outputs. |
| $\begin{aligned} & \text { COGENT } \\ & \text { RESEARCH } \end{aligned}$ | $\begin{aligned} & \text { PN1 } \\ & \text { PN2 } \\ & \text { PN4 } \\ & \text { PN3 } \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \end{aligned}$ | $\begin{aligned} & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \end{aligned}$ | 4F <br> 4F <br> 4F <br> 3F |  | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  |  | $\begin{aligned} & 0.001 \\ & \\ & 0.002 \\ & 0.002 \\ & 0.002 \end{aligned}$ | $\begin{aligned} & 112 \\ & 106 \\ & 106 \\ & 104 \\ & 103 \end{aligned}$ |  | $\begin{aligned} & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \end{aligned}$ | $0$ $\begin{aligned} & 0 \\ & 0 \\ & 0 \end{aligned}$ | No <br> No <br> No <br> No | $\begin{aligned} & 990.00 \\ & \\ & 750.00 \\ & 399.00 \\ & 299.00 \end{aligned}$ |  | simultaneous Polyphonic Isolator, eparates stereo into four front channels ore-create soundstage and ambience. As above. As above. <br> As above but three front channeis with ual center-channel output. |
| COUNTERPOINT | HC-808(R1) | DP | D | F/P/O | 3F, $2 B$ 2SW | 20.50 |  |  |  | 0.01 | 90 | 60 | Yes | 1 | No | 1295.00 |  | Motor-driven pots. |
| DENON | AVR-800(RI) <br> AVR-1000 <br> (RI) <br> AVR-3000 <br> (RI) <br> AVR-1500 <br> (RI) <br> AVR-2500 <br> (RI) <br> AVC-3030 <br> (RI) <br> AVP-5000 <br> (R\|) | $\begin{aligned} & \mathrm{DP} / 0 \\ & \mathrm{DP} / 0 \\ & \mathrm{DP} / 0 \\ & \mathrm{DP} / 0 \\ & \mathrm{DP} / 0 \\ & \mathrm{DP} / 0 \\ & \mathrm{DP/0} \end{aligned}$ | $\begin{aligned} & \hline D \\ & D / R \\ & D / R \\ & D / R \\ & D / R \\ & D / R \\ & D / R \end{aligned}$ | F/P <br> F/P <br> F/P <br> F/P <br> F/P | 3F, 2B <br> 3F, 2B <br> 3F, 2B <br> 3F, 2B <br> 3F, 2B <br> 3F, 2B <br> $3 F, 2 B, S W$ | $\begin{aligned} & 15-30 \\ & 6-30 \\ & 0-150 \\ & 0-50 \\ & 0-50 \\ & 0-150 \\ & 0-150 \end{aligned}$ | $\begin{aligned} & \hline 2 \\ & 6 \\ & 9 \\ & 9 \\ & 9 \\ & 9 \end{aligned}$ | $\begin{aligned} & V \\ & V \\ & V / S \\ & v \\ & t \end{aligned}$ | $\begin{aligned} & 60 \times 3, \\ & 15 \times 2 \\ & 70 \times 3, \\ & 20 \times 2 \\ & 110 \times 3 \\ & 35 \times 2 \\ & 70 \times 3 \\ & 20 \times 2 \\ & 80 \times 3 \\ & 25 \times 2 \\ & 110 \times 3, \\ & 35 \times 2 \end{aligned}$ | $\begin{aligned} & 0.08, \\ & 0.1, \\ & 0.03, \\ & 0.05 \\ & 0.08 \\ & 0.05 \\ & 0.03, \\ & 0.05 \\ & \\ & 0.005 \end{aligned}$ | $\begin{aligned} & 92 \\ & 92 \\ & \\ & 105 \end{aligned}$ |  | No <br> No <br> No <br> No <br> No <br> No | 1 <br> 2 <br> 2 <br> 2 <br> 2 <br> 4 | Yes Yes Yes Yes Yes Yes | 500.00 <br> 700.00 <br> 1400.00 <br> 750.00 <br> 1000.00 <br> 1350.00 <br> 2500.00 |  | A receiver (see also "Receivers") <br> As above; DSP for surround and ambience modes; adjustable parameters. As above; two remotes. <br> Wv receiver with RDS (see also Receivers"). As above; on-screen TV display. <br> AN amp (see also "Amps"); DSP for surround and ambience modes; adjustable parameters; on-screen TV display; wo remotes. <br> Digital processing preamp (see also Preamps") with two DSP units, two AD converters, and six D/A converters; parametric EQ. $\dagger$ Volume and liveness adjustments. |
| DYNACO | QD-1/IIL | DM |  |  | 3F, 2B |  |  |  |  |  |  |  |  |  | No | 89.95 |  | Passive unit; no additional amps required: with double banana jacks, QD-2, \$140.00. |
| ELITE | SP-910 | D/DP | D | F/P | 3F, 2B, 2S, SW | $1-50$ | 8 | V/S |  |  | 95 |  | Yes |  | No | 1000.00 |  | 18-bit D/A conversion. |
| FOSGATE. AUDIONICS | Three-A <br> Four <br> Five | DP/THXIO <br> DP/0 <br> DP/0 | $\begin{aligned} & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 3 \mathrm{~F}, 2 \mathrm{~B}, \\ & 2 \mathrm{~S}, 4 \mathrm{SW} \\ & 3 \mathrm{~F}, 2 \mathrm{~B}, \mathrm{SW} \\ & 3 \mathrm{~F}, 2 \mathrm{~B}, \mathrm{SW} \end{aligned}$ | $\begin{array}{l\|l}  & 15-70 \\ V & 15-45 \\ V & 15-45 \end{array}$ |  |  |  | $\begin{aligned} & 0.05 \\ & 0.05 \\ & 0.05 \\ & \hline \end{aligned}$ | $\begin{aligned} & 100 \\ & 100 \\ & 100 \end{aligned}$ | $\begin{aligned} & 45 \\ & 45 \\ & 45 \end{aligned}$ | Yes <br> Yes <br> Yes | 1 | Yes <br> Yes <br> No | $\begin{array}{r} 2799.00 \\ 999.00 \\ 599.00 \\ \hline \end{array}$ |  | AN preamp (see also "Preamps"). As above |

## The three most important letters in home theatre...



## AMERICAN CUSTOM THEATRE

## BETTER SOUND THAN A MOVIE THEATRE

Others are struggling to make home theatre sound almost as good as your local theatre. We've surpassed it. Others tell you how home theatre must always be done. We've customized it. We know that one size doesn't fit all. You define your needs, and we will help our dealer design a custom system based upon your personal requirements.

The heart of the American Custom Theatre is the Acurus ACT I Surround Sound Processor. When combined with high quality amplification, such as the Acurus 200X3, and the proper speakers for your listening environment, it will surpass the sound system in you local movie theatre. Now the best seat in the house, is in your house.

On-screen programming makes the ACT I as easy to use as your TV. Hand crafted in America, it has separate glass epoxy circuit boards for the three input audio section, three input video section and power supply. Utilizing 1\% metal film resistors and the most advanced surround sound processing integrated circuit, the Acurus ACT I has a smooth and refined sound that surpasses processors costing several times the price. Brought to you by Mondial Designs Ltd., acclaimed in Europe, Asia and America for engineering the best value in quality audio components.

## MONDIAL DESIGNS LIMITED

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

| $\begin{aligned} & \text { MATRIX CODE } \\ & \hline \text { A-Ambisonics } \\ & \text { D-Doloy Surround } \\ & \text { DP-Dolby Pro Log } \\ & \text { THX-THX Certified } \\ & \text { OM-Dynaco Matris } \\ & \text { SQ-SQ } \\ & \text { O-Other } \end{aligned}$ |  |  | $7$ |  | UNIT <br> TYPE |  |  |  | LAY <br> TIONS |  | - |  |  |  |  |  |  | OUTPUT CODE <br> 2F--Left \& Right Front <br> 3F -Left, Center, <br> \& Right Front <br> 2B -Left \& Right Back <br> 3B -Left, Center, <br> \& Right Back <br> 2S —Left \& Right Sides <br> SW-Subwooter |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| HARMAN KARDON | AVP-1A(RI) <br> AVP-2(RI) <br> AVR20 <br> AVR25 <br> AVR30(RI) | DP/THX <br> DM/O <br> DP/DM/0 <br> DP <br> DP <br> DP/O | $\begin{aligned} & D / R \\ & D / R \\ & D \\ & D \\ & D \end{aligned}$ | F/C/P/0 F/C/P/O F/O | $3 F_{1}, 2 B$, $2 S, 4 S W$ $3 F, 2 B, S W$ $3 F, 2 B$ $3 F, 2 B$ $3 F, 2 B$ $2 S W$ | $\begin{aligned} & 15-45 \\ & 15-45 \\ & 15-30 \\ & 8-96 \\ & 15-30 \end{aligned}$ | $\begin{aligned} & 9 \\ & 7 \\ & 1 \\ & 2 \\ & 20 \end{aligned}$ | V/S <br> V/S <br> V | $\begin{aligned} & 50 \times 3, \\ & 25 \times 2 \\ & 65 \times 3, \\ & 25 \times 2 \\ & 50 \times 3, \\ & 20 \times 2 \end{aligned}$ | $\begin{aligned} & 0.05 \\ & 0.05 \\ & 0.09 \\ & 0.09 \\ & 0.09 \end{aligned}$ | $\begin{aligned} & 95 \\ & 90 \\ & 92 \\ & 92 \\ & 98 \end{aligned}$ | $\begin{aligned} & 50 \\ & 50 \\ & 40 \\ & 40 \\ & 40 \end{aligned}$ | Yes <br> Yes <br> Yes <br> Yes <br> Yes | $\begin{aligned} & 1 \\ & 1 \\ & 3 \\ & 3 \\ & 4 \end{aligned}$ | $\begin{aligned} & 6 \\ & 3 \\ & 4 \\ & 6 \end{aligned}$ | $\begin{array}{r} 2799.00 \\ 1049.00 \\ 529.00 \\ 769.00 \\ 1149.00 \end{array}$ |  | Digital servo logic. <br> As above. <br> On-screen TV display |
| JBL | The Director | DP |  |  | 3F, 2B | 20 |  |  | $\dagger$ | 0.1 | 85 |  |  |  |  | 299.00 |  | Center, 25 watts; rear, 25 watts $\times 2$. Preamp out for all channels. |
| JVC | XPA1010(RI) SUA400(RI) | 0 <br> D/0 | $\mathrm{D} / \mathrm{R}$ | $\begin{aligned} & F / 0 \\ & F / P \end{aligned}$ | $\begin{aligned} & 4 F, 2 B \\ & 2 F, 2 B \end{aligned}$ | $\begin{aligned} & 0-200 \\ & 15-30 \end{aligned}$ | $\begin{aligned} & 20 \\ & 2 \end{aligned}$ | V/S | $10 \times 2$ | $\begin{aligned} & 0.002 \\ & 0.5 \end{aligned}$ | $\left\{\begin{array}{l} 110 \\ 85 \end{array}\right.$ |  | $\begin{aligned} & \text { No } \\ & \text { Yes } \end{aligned}$ | 1 1 | No No | $\begin{array}{r} 1200.00 \\ 305.00 \\ \hline \end{array}$ |  | Compensation for listening room size and reverb, and source reverb. |
| KINERGETICS RESEARCH | KSP-2(RI) | DP/THX | D | 0 | 3F, 2B, SW | 10-30 | 0 |  |  | 0.01 | $\dagger$ |  | Yes | 0 | No | 4500.00 |  | 0 dB in THX. External power supply; gradable remote. |
| LEXICON | $\left\lvert\, \begin{aligned} & \text { CP-1 Plus(RI) } \\ & \text { CP-2(RI) } \\ & \text { CP-3 Plus(RI) } \end{aligned}\right.$ | D/DP/0 <br> D/DP/O D/DP/ THXNO | $\begin{aligned} & \mathrm{D} / \mathrm{R} \\ & \mathrm{D} \\ & \mathrm{D} / \mathrm{R} \end{aligned}$ | F/P/O <br> F/P/O <br> F/P/O | $\begin{aligned} & 3 F, 2 B, 2 S, \\ & S W \\ & 3 F, 2 B, S W \\ & 3 F, 2 B, 2 S \\ & S W \end{aligned}$ | $\left\lvert\, \begin{aligned} & \dagger \\ & 16-32 \\ & \dagger \end{aligned}\right.$ | $\begin{aligned} & 27 \\ & 9 \end{aligned}$ | V/S <br> V/S |  | $\begin{aligned} & \hline 0.05 \\ & 0.05 \\ & 0.025 \end{aligned}$ | $\begin{aligned} & 85 \\ & 85 \\ & 90 \end{aligned}$ | 40 <br> Min. <br> 40 <br> 40 <br> Min. | Yes <br> Yes <br> Yes | $\begin{aligned} & 1 \\ & 0 \\ & 1 \end{aligned}$ | No <br> No <br> Yes | $\begin{array}{r} 1595.00 \\ 995.00 \\ 3200.00 \end{array}$ |  | 0 mS to 14 S . Auto azimuth; true digital Pro Logic. <br> As above. <br> As above; AV preamp (see also <br> "Preamps"); stereo surround; on-screen V display; two remotes. |
| LIRPA LABS | U8-1T2 | $\begin{aligned} & \mathrm{D} / \mathrm{O} / \mathrm{B} \\ & \mathrm{D} / \mathrm{O} / \mathrm{B} \\ & \mathrm{D} / \mathrm{O} \end{aligned}$ | D $\dagger$ | 0 | $\begin{aligned} & 3 F, 2 F, 2 B, \\ & 3 B, 16 S W \end{aligned}$ | $\dagger$ | $\dagger \dagger$ |  | Var. | 50.3 | 2.5 | 1/2 | Var. | 1/2 | Not | 730.94 |  | +15 mins. inbound, 20 outbound ( 75 on L.I.E.). $\dagger \dagger$ Presets include "Concert Hall, Coughs" and "Jazz Club. Drunks at Bar." Optional Nearly Almost Virtual Reality system, \$4.99. |
| MARANTZ | $\begin{aligned} & \text { AV-600THX } \\ & \text { EC-500 } \\ & \text { AV-500 } \\ & \hline \end{aligned}$ | DP/THX <br> DP <br> DP | $\begin{array}{\|l} \mathrm{D} \\ \\ \mathrm{D} \\ \mathrm{D} \\ \hline \end{array}$ |  | $\begin{aligned} & 3 F, 2 S \\ & 2 S W \\ & 3 F .2 S \\ & 3 F, 2 S \end{aligned}$ | $\begin{aligned} & 10-99 \\ & 10-30 \\ & 10-90 \end{aligned}$ | $\left[\begin{array}{l} 4 \\ 3 \\ 4 \end{array}\right.$ |  |  |  |  |  | Yes <br> Yes <br> Yes | $\begin{aligned} & 1 \\ & 1 \\ & 1 \end{aligned}$ | Yes <br> Yes Yes | $\begin{array}{r} 1099.00 \\ 1099.00 \\ 699.00 \end{array}$ |  | AN preamp with AM/FM tuner. <br> As above; includes CD player. AN preamp; color picture-in-picture. |
| MERIDIAN | 565 | AD/DP/ THX/SQ/O | D | F/C/P/0 | $\dagger$ | $\dagger$ |  | V/S |  | 00001 | 104 | 90 | Yes | 0 | Yes | 3600.00 |  | $\dagger 16$ user-configured outputs (eight analog, eight digital). $\dagger \dagger 0 \mathrm{mS}$ to 1 S . on-screen TV display; 12-character alphanumeric display; DSP. |
| MORDAUNTSHORT | Decoder One | DP | D |  | 3F, 2B, SW | 16 |  |  | $\dagger$ |  | 80 | 35 | Yes | 1 | No | 549.00 |  | +Center, 30 watts; rear, 30 watts $\times 2$. Alphanumeric display. |
| NAD | $\begin{aligned} & 910(\mathrm{RI}) \\ & 917(\mathrm{RI}) \end{aligned}$ | $\begin{aligned} & D P / 0 \\ & D P / 0 \end{aligned}$ | $\begin{aligned} & D \\ & D \end{aligned}$ |  | $\begin{aligned} & 3 F, 2 B, S W \\ & 3 F, 2 B, S W \end{aligned}$ | $\begin{array}{\|l\|} 20-30 \\ 20-30 \end{array}$ | $\begin{aligned} & 3 \\ & 3 \end{aligned}$ |  |  | $\begin{aligned} & 0.03 \\ & 0.03 \end{aligned}$ | 86 | $\begin{aligned} & 25 \\ & 25 \end{aligned}$ |  | $\frac{2}{2}$ | $\begin{aligned} & 3 \\ & 3 \\ & 3 \end{aligned}$ | $\begin{aligned} & 599.00 \\ & 799.00 \end{aligned}$ |  | AN preamp; AM/FM tuner with 40 presets; on-screen TV display; remote governs other NAD units. |
| ONKYO | $\begin{aligned} & \text { ES600PR0 } \\ & \text { (RI) } \end{aligned}$ | DP/0 | D |  | 28 | 20 | 2 |  |  | 0.9 | 79 |  | No |  | No | 410.00 |  |  |
| PARAMOUNT PICTURES | $\begin{aligned} & \text { DPL-2(RI) } \\ & \text { DPL-3(RI) } \end{aligned}$ | $\begin{aligned} & \text { OP } \\ & \text { DP } \end{aligned}$ | $\begin{array}{\|l} 0 \\ 0 \\ \hline \end{array}$ |  | $\begin{aligned} & 3 F, 2 B \cdot S W \\ & 3 F, 2 B \cdot S W \end{aligned}$ | $\begin{aligned} & 15-30 \\ & 15-30 \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \end{aligned}$ |  | $\dagger$ | $\begin{aligned} & 0.25 \\ & 0.25 \\ & \hline \end{aligned}$ | $\begin{aligned} & 80 \\ & 80 \\ & \hline \end{aligned}$ | $\begin{aligned} & 65 \\ & 65 \\ & \hline \end{aligned}$ | Yes <br> Yes | $\begin{aligned} & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { No } \\ & \text { No } \end{aligned}$ | $\begin{aligned} & 259.95 \\ & 329.95 \end{aligned}$ |  | †Center, 25 watts; rear, 12.5 watts $\times 2$. |
| PARASOUND | $\begin{aligned} & \text { P/SP-1000 } \\ & \text { (RI) } \\ & \text { P/SP-2000 } \\ & \text { (RI) } \end{aligned}$ | DP <br> DP/THX | D |  | $\left\|\begin{array}{l} 3 F, 2 B, S W \\ 3 F, 2 B, S W \end{array}\right\|$ |  | $\left\lvert\, \begin{aligned} & 4 \\ & 5 \end{aligned}\right.$ |  |  | $\begin{aligned} & 0.005 \\ & 0.005 \end{aligned}$ | $\begin{aligned} & 105 \\ & 105 \end{aligned}$ | 60 <br> 60 | No <br> No | 2 | 3 3 | $\begin{array}{\|r\|} \hline 750.00 \\ 1150.00 \end{array}$ |  | 5 -video inputs and outputs; auto and manual bypass. <br> As above. |
| PROCEED | PAV(RI) | DP/THX | D | F/P/0 | 3F. 2B. SW | 15-30 | 0 |  |  | 0.03 | 80 |  | Yes | 4 | 4 | 4195.00 |  | Multi-zone AN preamp (see also "Preamps"); on-screen programming. |
| PROTON | SD-1000(RI) | 0 |  | F/P | 3F, 38, SW |  |  | V |  | 0.008 | 100 | 58 | No | 1 | No | 600.00 |  | Enhanced logic; four- to seven-channe\| surround. |
| ROTEL | RSP-960AX | DP | D |  | 3F. 2S, SW | 20 or 30 | 3 | v |  | 0.025 | 125 | 35 | Yes | 1 | 2 | 599.90 |  | Adjustable subwoofer crossover frequency and level. |
| SOUNOSTREAM TECHNOLOGJES | C 2 2 THX(R1) | DP/THX/ <br> DM/0 | D/R | F/C/P/0 | $\begin{aligned} & 3 F, 2 B, 2 S . \\ & 4 S W \end{aligned}$ | 15-30 | 9 | V/S |  | 0.05 | 95 | 40 | Yes | 1 | 6 | 2795.00 |  | AN preamp (see also "Preamps"); two S-video inputs |
| SRS LABS | AK-100 <br> Retriever | 0 |  | $\dagger$ | 2 F |  |  |  |  |  |  |  | ¢es |  |  | $\begin{aligned} & 299.00 \\ & 179.00 \end{aligned}$ |  | †Sound Retrieval System. |
| SSI <br> SURROUND SOUND | System 3000 (RI) System 3200 (RI) System $40011($ R1) System 5000 | $\begin{aligned} & D P \\ & D P \\ & D / 0 \\ & D P \end{aligned}$ | $\begin{aligned} & \mathrm{D} \\ & \mathrm{D} \\ & \mathrm{D} \\ & \mathrm{D} \end{aligned}$ |  | $\begin{aligned} & 3 F, 2 B, S W \\ & 3 F, 2 B, S W \\ & 3 F, 4 B, S W \\ & 3 F, 2 B, S W \end{aligned}$ |  | $\begin{array}{\|l} 3 \\ 3 \\ 3 \\ 3 \end{array}$ |  | $25 \times 2$ $25 \times 2$ $45 \times 2$ <br> $50 \times 2$ | $\begin{aligned} & 0.25 \\ & 0.25 \\ & 0.25 \\ & 0.25 \end{aligned}$ | $\begin{aligned} & 80 \\ & 80 \\ & 80 \\ & 80 \end{aligned}$ | $\begin{aligned} & 65 \\ & 65 \\ & 85 \\ & 65 \end{aligned}$ | $\begin{aligned} & \text { No } \\ & \text { No } \\ & \text { No } \\ & \text { No } \end{aligned}$ | 1 | No No 4 Yes | $\begin{aligned} & 249.00 \\ & 299.00 \\ & 499.00 \\ & 449.00 \end{aligned}$ |  | AN preamp with multi-media input/output port (see also "Preamps"); S-video inputs |
| TECHNICS | SH-GE90 | 0 |  |  |  |  | 6 |  |  | 0.08 | 86 |  |  |  |  | 349.95 |  | Digital sound processor with parametric EQ; six additional "sound" presets; two mike inpuis; karaoke/voice mute; spectrum analyzer. |
| YAMAHA | DSP-A2070 (RI) DSP-A970 (RI) DSP-A780 (RI) OSP-E1000 (RI) DSP-E580(RI) | $\begin{aligned} & \mathrm{DP} / 0 \\ & \mathrm{DP} / 0 \\ & \mathrm{DP} / 0 \\ & \mathrm{DP} / 0 \\ & \mathrm{DP} / 0 \end{aligned}$ | D/R <br> $D / R$ <br> D/R <br> $D / R$ <br> D/R | $\begin{aligned} & F / 0 \\ & F / 0 \\ & F / 0 \\ & 0 \\ & 0 \end{aligned}$ | 5F, 28 , 2SW $5 \mathrm{~F}, 2 \mathrm{~B}, \mathrm{SW}$ 3F, 2B, SW $5 \mathrm{~F}, 2 \mathrm{~B}, \mathrm{SW}$ 3F, 2B, SW | $\begin{array}{l\|l}  & 1-49 \\ N & 1-49 \\ N & 1-49 \\ N & 1-49 \\ N & 1-49 \end{array}$ | $\begin{aligned} & 24 \\ & 23 \\ & 16 \\ & 23 \\ & 16 \end{aligned}$ | V <br> V <br> V <br> V/S <br> V | $\begin{aligned} & 80 \times 3, \\ & 25 \times 4 \\ & 65 \times 3, \\ & 22 \times 4 \\ & 65 \times 3, \\ & 25 \times 2 \\ & 80 \times 1, \\ & 25 \times 4 \\ & 25 \times 3 \end{aligned}$ | $\begin{aligned} & 0.015 \\ & 0.015 \\ & 0.015 \\ & 0.015 \\ & 0.03 \end{aligned}$ | 96 96 96 96 98 | $\begin{aligned} & 60 \\ & 60 \\ & 60 \\ & 65 \\ & 65 \end{aligned}$ | Yes <br> Yes <br> Yes <br> Yes <br> Yes | 1 | Yes Yes 3 1 | $\begin{array}{r} 1999.00 \\ 1299.00 \\ 899.00 \\ 999.00 \\ 699.00 \end{array}$ |  | Digital sound-field processing. <br> As above. $\dagger$ Selectable record out. <br> As above. <br> As above. <br> As above. |

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## CROSSOVERS

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| ACCUPHASE | F-25 | A | M/S/X | 2 | 70-800, 1k-12.5k | Opt. | P | M | H/L | 100 | 0.003 | 1 | $\dagger$ | 50 | 7100.00 | $\ddagger$ Unbalanced, 20 kilohms; balanced, 40 kilohms. Upgradable to 4 -way with optional boards (\$210.00 each). |
| ACE AUDIO | $\begin{aligned} & 6500-\mathrm{DSB} \\ & 6000 \\ & 6000-6 \end{aligned}$ | $\begin{aligned} & A \\ & A \\ & \text { C } \end{aligned}$ | MFS/X S S | 2 2 2 2 | $\begin{aligned} & 30-200 \\ & 200-15 \mathrm{k} \\ & 30-18 \mathrm{k} \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \\ & \text { Yes } \end{aligned}$ | P | $\begin{aligned} & S / M \\ & S / M \end{aligned}$ | $\begin{aligned} & \text { H or } L \\ & \text { H or } L \text {. } \\ & \text { Hor } L . \end{aligned}$ | $\begin{array}{\|l\|} 90 \\ 90 \\ 90 \\ \hline \end{array}$ | $\begin{aligned} & 0.002 \\ & 0.002 \\ & 0.002 \end{aligned}$ | $\begin{aligned} & 1.0 \\ & 1.0 \\ & 1.0 \end{aligned}$ | $\begin{aligned} & 100 \mathrm{k} \\ & 100 \mathrm{k} \\ & 100 \mathrm{k} \end{aligned}$ | $\begin{array}{\|l\|} \hline 100 \\ 100 \\ 100 \\ \hline \end{array}$ | $\begin{aligned} & 185.00 \\ & 185.00 \\ & 195.00 \end{aligned}$ | Optional subsonic filter, $\$ 25.00$. As above As above; transient-perfect filter. |
| AMERICAN POWER AND LIGHT | Vacuum Tube Complementary Solid State | $\begin{aligned} & A \\ & A \end{aligned}$ | $\begin{aligned} & \mathrm{S} \\ & \mathrm{~S} \end{aligned}$ | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ | $\begin{aligned} & 40-200,800-2 \mathrm{k} \\ & 40-100 \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { No } \end{aligned}$ | $\begin{aligned} & \mathrm{S} \\ & \mathrm{~S} \end{aligned}$ | $\underset{S}{S / M / B}$ | $H / M / L$ | $\begin{aligned} & 95 \\ & 95 \end{aligned}$ | $\begin{aligned} & 0.001 \\ & 0.001 \end{aligned}$ | $\begin{aligned} & 0.77 \\ & 0.77 \end{aligned}$ | $\begin{aligned} & 55 \mathrm{k} \\ & 55 \end{aligned}$ | $\begin{aligned} & 100 \\ & 100 \end{aligned}$ | $\begin{array}{r} 1200.00 \\ 800.00 \end{array}$ | Tube. <br> First-order |
| ANALOG RESEARCH | Custom | A | S | 2 | Custom | Yes | F | S | L. | 90 | 0.01 |  | 10k | 500 | $\begin{array}{r} \text { From } \\ 600.00 \end{array}$ | External power supply required. |
| ATHENA | DF-10 | A | S | 2 | 15-15k | No | v | S | H/L | 96 | 0.001 | 1.0 | 100k | 560 | 1800.00 |  |
| AUDIO CENTRON | AC- $\times 32$ | A | 5 |  | 20-10k | Yes | $v$ |  | H/M/L | 95 | 0001 | 1.0 | 10k | 1k | 365.00 |  |
| AUDIOCONTROL | Richter Scale <br> Series lil <br> Phase Coupled Activator Series II | A <br> A | $5 / x$ <br> S | $2$ $2$ | $20-20 \mathrm{k}$ |  | p <br> P | S/M/B S | L <br> L | $\begin{aligned} & 120 \\ & 118 \end{aligned}$ | $\begin{aligned} & 0.005 \\ & 0.005 \end{aligned}$ | $\begin{aligned} & 1.0 \\ & 1.0 \end{aligned}$ | $\begin{aligned} & 100 \mathrm{k} \\ & 100 \mathrm{k} \end{aligned}$ | $\begin{aligned} & 150 \\ & 150 \end{aligned}$ | $349.00$ | Linkwitz-Riley alignment; $1 / 2$-octave bass EQ and analyzer (see also "Equalizers"). Linkwitz-Riley alignment; 24-dB/ octave slope: proprietary bassrestoration circuits; bass time alignment; subsonic tilter; speaker and line-level inputs (see also "Signal Processors"). |
| AUDIO RESEARCH | EC-22 | A | S | 2 | Custom | Yes | P |  | L | 120 | 0.01 | 1 | 50k | 250 | 260000 | Frequency and slope (6, 12, or $18 \mathrm{~dB} /$ octave) selected by changing circuit cards; bypass outputs; mute switch. |
| THE A.W.S. GROUP/ PRO SYSTEMS | $\begin{aligned} & 9402 \\ & 9415 \\ & 9425 \end{aligned}$ | $\begin{aligned} & \hline P \\ & P \\ & P \\ & P \end{aligned}$ |  | $\begin{aligned} & 2 \\ & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & 2.5 \mathrm{k} \\ & 2.5 \mathrm{k} \\ & 2.5 \mathrm{k} \end{aligned}$ | $\begin{aligned} & \text { No } \\ & \text { Yes } \\ & \text { Yes } \end{aligned}$ | $\begin{aligned} & \hline F \\ & F \\ & F \end{aligned}$ |  |  |  |  |  | 8 8 8 | $\begin{aligned} & 8 \\ & 8 \\ & 8 \end{aligned}$ | 39.00 55.00 55.00 |  |
| BAG END | $\begin{aligned} & \text { ELF-1 } \\ & \text { ELF-M } \end{aligned}$ | A <br> A | S <br> $x$ | 2 <br> 2 | $50-205$ $60-200$ | Yes <br> Yes | S <br> P | S <br> M | H/L <br> L | $110$ <br> 85 | $\begin{aligned} & 0.005 \\ & 0.005 \end{aligned}$ | $\begin{aligned} & 0.75 \\ & 0.75 \end{aligned}$ | $25 k$ $25 k$ | $50$ $100$ | $\begin{aligned} & 2460.00 \\ & 798.00 \end{aligned}$ | For Bag End S $10 \mathrm{E}-\mathrm{I}, \mathrm{S} 18 \mathrm{E}-1$, S18E-0, and D10E-O and other ELF-lype subwoofers; response rises $12 \mathrm{~dB} /$ octave as trequency goes down. As above. |
| BRYSTON | $\begin{aligned} & \text { 10B-SUB } \\ & \text { 108-Standard } \end{aligned}$ | A <br> A | S <br> S | $\dagger$ <br> $\dagger$ | $\begin{aligned} & 40-500 \\ & 70-4.5 \mathrm{k} \end{aligned}$ | Yes <br> Yes | S <br> S | S <br> S | H <br> H | $90$ <br> 90 | $\begin{aligned} & 0.005 \\ & 0.005 \end{aligned}$ | $\begin{aligned} & 1 \\ & 1 \end{aligned}$ | $\begin{aligned} & 20 \mathrm{k} \\ & 20 \mathrm{k} \end{aligned}$ | $\begin{aligned} & 100 \\ & 100 \end{aligned}$ | $\begin{aligned} & 1195.00 \\ & 1195.00 \end{aligned}$ | $\dagger$ Usable as stereo 2-way or mono 3-way. Optional Linkwitz-Riley alignment. As above. |
| CAL.IBRATION STANDARD INSTRUMENTS | HLEE-2 | A | S/0 | 2 | 30-200 | Yes | S/P | S/M/B | 12 | 92 | 0.02 | 0.50 | 10k | 600 | 2490.00 | ELF system. |
| CURCIO AUDIO ENGINEERING | MP-D2X0 | A | S | 2 | 60-4k | Yes | v | S | H/L | 73 | 0.008 | 0.1 | 100k | 300 | 3000.00 | Hybrid tube design; kit, \$1350.00. |
| DANA AUDIO | x0-1 | A | $x$ | 2 | Custom | No | F | M | L | 100 | 0.005 | 0.75 | 100k | 1 | 300.00 | Fourth-order Linkwitz-Riley alignment. |
| DB SYSTEMS | $\begin{aligned} & \text { DB-3-18 } \\ & \text { DB-3-24 } \\ & \text { DB-3-36 } \end{aligned}$ | $\begin{aligned} & \mathrm{A} \\ & \mathrm{~A} \\ & \mathrm{~A} \end{aligned}$ | $\begin{aligned} & S / X \\ & S / X \\ & S / X \end{aligned}$ | $\begin{aligned} & 2.3 \\ & 2 \\ & 2 \end{aligned}$ | Optional <br> Optional Optional | Yes <br> Yes Yes | F $\stackrel{F}{F}$ | S/M/B <br> S/M/B S/M/B | H/M/L. <br> H/L H/L | $\begin{aligned} & 100 \\ & 100 \\ & 100 \end{aligned}$ | $\begin{aligned} & 0.0008 \\ & 0.0008 \\ & 0.0008 \end{aligned}$ | $1$ | $\begin{aligned} & 90 \mathrm{k} \\ & 90 \mathrm{k} \\ & 90 \mathrm{k} \end{aligned}$ | $\begin{aligned} & 1.4 \mathrm{k} \\ & 1.4 \mathrm{k} \\ & 1.4 \mathrm{k} \end{aligned}$ | From 450.00 615.00 690.00 | 18-dB/octave slope; 6 or 12 dB avaiable. <br> Linkwitz-Riley alignment. $36-\mathrm{dB} / \mathrm{octave}$ slope. |
| ELECTRO-VOICE | $\begin{aligned} & \text { EX-18 } \\ & \text { EX-24 } \end{aligned}$ | A | M/S | $\dagger$ | 80-6.3k | Yes | F/P | S/M | H/M/L | 96 | 0.05 | . 775 | 15k | 100 | $\begin{aligned} & 444.00 \\ & 664.00 \end{aligned}$ | $\dagger$ Usable as stereo 2 -way or mono 3 -way. Balanced and unbalanced inputs and outputs; balanced impedance, 30 kilohms in and 200 ohms out; EQ for constantdirectivity horn. |
| ENTEC | 1000 | P | S | 1 | Selectable |  | S | S | H |  |  |  |  |  | 125.00 | High-pass only; for Entec 1000 Series subwooters. |
| ESSENCE | Jasper | P | M | $\dagger$ | Adjustable | Yes | P | M | $\dagger$ | 120 | 0.001 |  | Adj. | Adj. | $\dagger$ | $\dagger 2$ to 6 bands per channel, with plug-in level control for each band. $\dagger+\$ 1385.00$ to $\$ 4850.00$. Optimized for Essence Reference 12 system (Amethyst 10A and Reference subwoofer). |
| FM ACOUSTICS (Continued) | $\begin{aligned} & 236 \cdot \times 100 \\ & \text { MK } 11 \end{aligned}$ | A | S | 2 | 60-1.6k | Yes | P | S | H/L | 110 | 0.008 | . 775 | 30k | 1 | 11.980 | Balanced inputs; with balanced inputs and outputs, $\$ 14,800$. |

## CROSSOVERS



## CROSSOVERS

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| NAIM AUDID | NAXO 3-6 <br> NAXO 2-4 | A A | $\begin{aligned} & \mathrm{S} \\ & \mathrm{~S} \end{aligned}$ | $\begin{aligned} & 3 \\ & 2 \end{aligned}$ | Custom <br> Custom | $\begin{array}{\|l\|} \hline \text { Yes } \\ \text { Yes } \end{array}$ | F |  | H/M/L <br> H/L | $\begin{aligned} & 90 \\ & 90 \end{aligned}$ | $\begin{aligned} & 0.01 \\ & 0.01 \end{aligned}$ | $1$ | $\begin{array}{\|l\|} \hline 20 k \\ 20 k \\ \hline \end{array}$ | $\begin{aligned} & 47 \\ & 47 \end{aligned}$ | $\begin{aligned} & 1125.00 \\ & 1125.00 \end{aligned}$ | Requires Naim Hi-Cap power supply, $\$ 1235.00$. As above. |
| NEI | 321 | A | M/S | 2 | 100-2k, 1k-20k | No | $v$ |  | H/L | 102 | 0.003 | 1.4 | $\dagger$ | $\dagger$ | 249.00 | $\dagger$ Unbalanced, 10 kilohms in and 300 ohms out: balanced. 20 kilohms in and 600 ohms out. |
| NELSON-REED | AC-1204 <br> Bass Exchange | $\begin{aligned} & \mathrm{C} \\ & \mathrm{~A} \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathrm{S} \\ \mathrm{~S} \end{array}$ | $\begin{aligned} & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & 62 \\ & 60-120 \end{aligned}$ | $\begin{aligned} & \text { No } \\ & \text { No } \end{aligned}$ | $\begin{aligned} & \mathrm{F} \\ & \mathrm{P} \end{aligned}$ | $\begin{aligned} & S / M \\ & S \end{aligned}$ | $\begin{aligned} & \mathrm{L} \\ & \mathrm{~L} \end{aligned}$ | $\begin{aligned} & 118 \\ & 90 \end{aligned}$ | $\begin{aligned} & 0.007 \\ & 0.01 \end{aligned}$ | 1.0 | $\begin{aligned} & 22 \mathrm{k} \\ & 50 \mathrm{k} \end{aligned}$ | $\begin{aligned} & 100 \\ & 100 \end{aligned}$ | $\begin{aligned} & 850.00 \\ & 650.00 \end{aligned}$ | For Nelson-Reed 1204/P subwooter. Bass EO, $\pm 10 \mathrm{~dB}$; contour. |
| NESTOROVIC LABORATORIES | NL12A | A | S | 2 | 200 | No | F | S | H/L | 90 | 001 | 1 | 50k | 100 | 935.00 | For Nestorovic Systemi 12A. |
| NE.W | X-10 | A | S |  |  |  | S | S |  |  |  |  |  |  | 898.00 |  |
| NOBIS TECHNOLOGIES | EC-1 | c | S | 2 | 80 | No | F | S/B | L | 92 | 0.01 | . 775 | 50k | 600 | 399.00 |  |
| RANE | AC 22 <br> AC 23 <br> SSE 35 | A $A$ $A$ | M/S/X <br> M/S <br> S/X | $\begin{aligned} & \dagger \\ & \dagger \\ & 2 \end{aligned}$ | $70-3.6 \mathrm{k}$ $70-\mathrm{tk}, 190-7 \mathrm{k}$ $80 / 125$ | No <br> No <br> No | v v <br> S | $S / M$ $S / M$ $S M$ | $\begin{aligned} & \mathrm{H} / \mathrm{M} / \mathrm{L} \\ & 6 \end{aligned}$ | $\begin{aligned} & 92 \\ & 92 \end{aligned}$ | $\begin{aligned} & 0.02 \\ & 0.02 \end{aligned}$ | $\begin{aligned} & 1 \\ & \text { Max. } \\ & 1 \\ & \text { Max. } \end{aligned}$ | $\begin{aligned} & 20 \mathrm{k} \\ & 20 \mathrm{k} \end{aligned}$ | $\begin{aligned} & 100 \\ & 100 \end{aligned}$ | $\begin{aligned} & 399.00 \\ & 499.00 \end{aligned}$ | $\dagger$ Usable as stereo 2-way or mono 3-way. <br> $\dagger$ Usable as stereo 3 -way or mono 4- or 5 -way. Balanced inputs; with balanced in/out (output impedance, 200 ohms), $\$ 529.00$. Includes EQ (see "Equalizers") |
| RESONANCE | $\begin{aligned} & \hline \text { Active } \\ & \text { Bass Circuit } 1.0 \end{aligned}$ | A | x | 2 | 100 | No | F |  |  | 87 | 0.005 |  |  |  | 349.00 | Includes limiting compressor and parametric bass EO (see also "Signal Processors" and "Equalizers"); 24 -dB/octave lowpass and $18-\mathrm{dB} / 0 \mathrm{ctave}$ high-pass at 100 Hz ; subsonic filter; balanced and unbalanced inputs and outputs. |
| SESCOM | $\begin{aligned} & \text { PO-51 } \\ & \text { R/S C0 } \end{aligned}$ | $\begin{aligned} & A \\ & A \end{aligned}$ | $\begin{aligned} & \mathrm{M} \\ & \mathrm{~S} \end{aligned}$ | $\begin{array}{\|l\|} \hline 3 \\ 3 \end{array}$ | $\begin{aligned} & 20-200,200-2 \mathrm{k}, \\ & 2 \mathrm{k}-20 \mathrm{k} \\ & 50-1 \mathrm{k}, 1 \mathrm{k}-10 \mathrm{k} \end{aligned}$ | $\begin{aligned} & \text { Yes } \\ & \text { Yes } \end{aligned}$ | P $v$ | No | H/L | $\begin{aligned} & 80 \\ & 85 \end{aligned}$ | $\begin{aligned} & \hline 0.01 \\ & 0.01 \end{aligned}$ | $\begin{aligned} & 0.75 \\ & 1 \end{aligned}$ | $\begin{aligned} & 10 \mathrm{k} \\ & 15 \mathrm{k} \end{aligned}$ | $\begin{aligned} & 100 \\ & 600 \end{aligned}$ | $\begin{aligned} & 190.60 \\ & 200.00 \end{aligned}$ | Requires P0-1 power supply. <br> Balanced inputs and outputs; kit, $\$ 135.00$. |
| SIGNATURE TECHNOLOGIES | LPt-2 | c | S | 2 | 80 | No | F | S/B | L | 92 | 0.01 | . 775 | 50k | 600 | 399.00 |  |
| SNELL ACOUSTICS | EC 200 | A | $x$ | 2 | 80 | No | F | S/M | 5 | 92 | 0.01 |  | 15k | 100 | 299.00 | 12-dB/octave high-pass, 24-dB/octave low-pass. |
| SNELL <br> MULTIMEDIA | EC 300 | A | $x$ | 2 | 80 | No | F | S/M | 6 | 92 | 0.01 |  | 15k | 100 | 299.00 | 12-dB/octave high-pass, 24 -dB/octave low-pass; highpass output for center channel |
| SOUNDOLIER | $\begin{aligned} & \text { ThundraPro } \\ & \text { CXA } \end{aligned}$ | A | x | 2 | HP: 100/150/200 <br> LP: 80-200 | Yes | S $N$ | M | L |  | 0.1 | 1.0 |  |  | 498.75 | Subwoofer crossover with mono amp (see aiso "Amps"); reversepolarity switching; input sensing; subsonic filter |
| SUMO | Deililah II | A | S/X/0 | 2 | 50/63/80/100/125 | Yes | S | S/M/B | L | 95 | 0.007 | 2 | 47k | 75 | 599.00 | Bypassable Class-A high-pass section. |
| SYMETRIX | 524E | A | M/S/0 | $\dagger$ | 70-10k | Yes | P |  | 4 | 109 | 0.03 | 1.23 | 10k | 200 | 1095.00 | $\dagger$ Usable as stereo 2-way, mono 3 -way, or mono 4 -way. Balanced inputs and outputs; phase controls; outputs have independent limiters. |
| TC SOUNOS | TCX | A | S | 2 | 30-10k | Yes | P | S | L | 96 | 0.01 | 1.0 | 20k | 100 | 1195.00 | Balanced and unbalanced inputs and outputs. |
| UNITY AUDIO | Unity PARM | c | S | 2 | 40-300 | Yes | P | S | L | 115 | 0.001 | 1 | 600 | 600 | 2750.00 | Fully balanced differential circuits. |
| WEL BORNE LABS | ACT 1 <br> ACT 4 <br> ACT 10 | A <br> A <br> A | $\begin{aligned} & \mathrm{S} \\ & \mathrm{~S} \\ & \mathrm{~S} \end{aligned}$ | $\begin{aligned} & 2 \\ & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & 50-5 k \\ & 50-5 k \\ & 50-5 k, 4 k-8 k \end{aligned}$ | Yes <br> Yes Yes | $P$ <br> P <br> $P$ | $\begin{aligned} & \mathrm{s} \\ & \mathrm{~s} \\ & \mathrm{~s} \end{aligned}$ | $\begin{aligned} & H / L \\ & H / L \\ & H / L \end{aligned}$ | $\begin{aligned} & 110 \\ & 110 \\ & 110 \end{aligned}$ | $\begin{aligned} & 0.002 \\ & 0.002 \\ & 0.002 \end{aligned}$ | $\begin{aligned} & 2 \\ & 2 \\ & 2 \end{aligned}$ | $\begin{aligned} & 50 \mathrm{k} \\ & 50 \mathrm{k} \\ & 50 \mathrm{k} \end{aligned}$ | $\begin{aligned} & 100 \\ & 100 \\ & 100 \end{aligned}$ | $\left\lvert\, \begin{aligned} & 1435.00 \\ & 1645.00 \\ & 2360.00 \end{aligned}\right.$ | Choice of frequencies and slopes ( 6 to $24 \mathrm{~dB} /$ octave); discrete Class-A buffers; kit, $\$ 1035.00$ As above but $\$ 1245.00$ for kit; balanced inputs and outputs. As above but $\$ 1960.00$ for kit. |



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## LOUDSPEAKERS

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| ADVANCED SOUND | Bi Polar Satellite Bi Polar Amplified Sub- | Bipolar Sat. <br> Powered Subwoof | $\begin{aligned} & (2) 8 \\ & (4) 10 \end{aligned}$ | $41 / 2$ | Cone | 1,11/4 | Domes | No W | $150-22 \pm 3$ $30-150 \pm 3$ | 94 94 | 200 160 Inc. | $\begin{aligned} & 150,1 \mathbf{k}, \\ & 5 \mathrm{k}, 12 \mathrm{k} \\ & 150 \end{aligned}$ | 6/4 | $\begin{aligned} & 50 \times 30 \times 6 \\ & 50 \times 20 \times 28 \end{aligned}$ | $\begin{aligned} & \text { Opt., } \\ & \text { Wood } \\ & \text { Opt., } \\ & \text { Wood } \end{aligned}$ | $\begin{aligned} & \hline \text { Opt., } \\ & \text { Knit } \\ & \text { Opt, } \\ & \text { Knit } \end{aligned}$ | 180 300 | 9000.00 Pair 6500.00 Pair |
|  | Ziggurat | Time Aligned, Tuned Port |  | 8 | Cone | 3 | Dome | M 7 | $32-20 \pm 3$ | 91 | 200 | 900,6k | 6/8 | $41 \times 17 \times 15$ | Opt, Wood | $\begin{aligned} & \text { Opt., } \\ & \text { Knoit } \end{aligned}$ | 150 | 3500.00 Pair |
|  | Campanile I | Tuned Port | (2) 8 | $41 / 2$ | Cone | 3 | Dome | M/T | $38-20 \pm 3$ | 92 | 100 | 300,2.5k | 6/4 | $36 \times 13 \times 13$ | Opt, | Opt, Knit | 95 | 2000.00 Pair |
|  | Campanile If | Tuned Port | (2) 10 | 8 | Cone | 3 | Dome | M/T | $35-22 \pm 3$ | 93 | 200 | 300,2.5k | 4/3 | $49 \times 13 \times 20$ | Opt., Wood | Opt, Knit | 130 | 4000.00 Pair |
|  | Monolith 12P | Powered Tuned Port; Subwoof. | 12 |  |  |  |  | w | $32-150 \pm 3$ | 91 | 100 | 150 | 6/8 | $22 \times 20 \times 20$ | Opt, Wood | $\begin{aligned} & \text { Opt, } \\ & \text { Onit, } \end{aligned}$ | 130 | 2000.00 Pair |
|  | Monolith 12 | Tuned Port; <br> Subwoof | 12 |  |  |  |  | No | 32-150 $\pm 3$ | 91 | 100 | 150 | 6/8 | $22 \times 20 \times 20$ | Opt, Wood | Opt, | 110 | 1200.00 Pair |
|  | Monolith 10P | Powered Tuned Port; | 10 |  |  |  |  | W | 32-150 $\pm 3$ | 91 | 100 | 150 | 6/8 | $22 \times 20 \times 20$ | Opt, | Opt, | 125 | 1800.00 Pair |
|  | Monolith 10 | Tuned Port: | 10 |  |  |  |  | No | 32-150 $\pm 3$ | 91 | 100 | 150 | 6/8 | $22 \times 20 \times 20$ | Opt., | Opt., | 110 | 1100.00 Pair |
|  | Cornerstone Bookshelf | Sat. | (2) $4^{1 / 2}$ |  |  | 3 | Dome | No | $120-20 \pm 3$ | 94 | 35 | 6 k | 4/6 | $18 \times 8 \times 12$ | Opt., Wood | $\left\lvert\, \begin{aligned} & \text { Knit } \\ & \text { Opt, } \\ & \text { Knit } \end{aligned}\right.$ | 30 | 600.00 Pair |
|  | Cornerstone | Powered Tuned Port; | 12 |  |  |  |  | (2) W | $38-150 \pm 3$ | 89 | (2) 80 | 150 | 4/3 | $22 \times 20 \times 20$ | Opt, | Kpt., | 130 | 1200.00 Each |
|  | ${ }^{\text {Cornerstone }}$ | Powered Tuned Port; | (4)8 |  |  |  |  | (2) W | 45-150 $\pm 3$ | 94 | inc. (2) 80 | 150 | 4/3 | $22 \times 20 \times 20$ | Wood. | Knit, | 145 | 1350.00 Each |
|  | 4/8SP | Stereo Subwoof. |  |  |  |  |  |  |  |  | Inc. |  |  |  | Woad | Knit |  |  |
|  | Cornerstone 125 | Tuned Port; <br> Stereo Subwoof | 12 |  |  |  |  | No | $38-150 \pm 3$ | 89 | 100 | 150 | 4/3 | $22 \times 20 \times 20$ | Opt., Wood Wer |  | 115 | 800.00 Each |
|  | $\begin{aligned} & \text { Cornerstone } \\ & 4 / 85 \end{aligned}$ | Tuned Port; <br> Stereo Subwoof. | (4) 8 |  |  |  |  | No | $45-150 \pm 3$ | 94 | 100 | 150 | 4/3 | $22 \times 20 \times 20$ | Opt., Wood | $\left\lvert\, \begin{aligned} & \text { Opm1, } \\ & \text { Knit } \end{aligned}\right.$ | 115 | 800.00 Each |
| ADVENT | Heritage | Ac. Sus. | (2) 8 |  |  | 1 | Dome |  | 42-23 $\pm 3$ | 89.5 | 10 | 3.5 k | 8/4 | $38 \times 10 \times 13$ | oil. <br> Pecan | Brn. Knit | 45 | 699.95 Pair |
|  | Legacy III | Ac. Sus. | 10 |  |  | 1 | Dome |  | $40-23 \pm 3$ | 90 | 10 | 2.5k | 8/6 | $32 \times 14 \times 10$ | Oil. | Bik. | 42 | 450.00 Pair |
|  | Mini Advent | Ac. Sus. | 51/4 |  |  | $1 / 2$ | Dome |  | $110-21 \pm 3$ | 88 | 10 | 4.5k | 6/4 | $11 \times 6 \times 5$ | ${ }^{\text {Pecan }}$ | Brn. Knit | 10 | 179.00 Pair |
|  | Mini Advent Subwooter III | Ac. Sus.; Subwoof. | (2) $61 / 2$ |  |  |  |  |  | $50-180 \pm 3$ | 91 | 10 | 180 | 6/4 | $13 \times 15 \times 8$ | Blk. Vnl. |  | 20 | 199.00 Each |
|  | Baby III | Ac. Sus. | $61 / 2$ |  |  | 1/2 | Dome |  | $60-21 \pm 3$ | 89 | 10 | 4.5 k | $8 / 4$ | $16 \times 11 \times 6$ | Oak | ${ }^{\text {Brn. Knit }}$ | 13 | 229.00 Pair |
|  | Video Shielded Prodigy Tower | AN: Ac. Sus. |  |  |  | 3/4 | Dome |  | $45-23 \pm 3$ | 89 | 10 | 3k | 8/6 | $28 \times 10 \times 9$ | Blk. Oak | Blk. Cioth Bobl | 25 | 379,00 Pair |
|  | Prodigy Tower I | Ac. Sus. | $\stackrel{8}{5}$ |  |  | $1 / 2$ | Dome |  | $45-23 \pm 3$ | $89$ | $10$ | $3 \mathrm{k}$ | $8 / 4$ | $28 \times 10 \times 9$ | Pecan | Brn. Knit | $25$ | 349.95 Pair |
|  | Indoor/Dutdoor Mini II | Ac. Sus. | $51 / 4$ |  |  | $1 / 2$ | Dome |  | $110-21 \pm 3$ | 88 | $10$ | $4.5 \mathrm{k}$ | 8/4 | $11 \times 6 \times 5$ | Opt. | Poly. | $10$ | 179.00 Pair |
|  | Laureate | Ac. Sus | (2) $61 / 2$ |  |  | 1 | Dome |  | $42-23 \pm 3$ | 90 | 10 | 3k | 8/4 | $38 \times 9 \times 12$ | BIk./ | Brn. Knit | 46 | 549.95 Pair |
|  | Bookshelf I | Bass Ret | 51/4 |  |  | 1/2 | Dome |  | $80-20 \pm 3$ | 89 |  | 4.5k | 8/6 | $13 \times 8 \times 8$ | Wood | Blk. Knit |  | 129.00 Pair |
|  | In-Wall Gailery | In-Wall | 61/2 |  |  | 1/2 | Dome |  | $60-21 \pm 3$ | 89 | 10 | 4.5k | 6/4 | $13 \times 9$ |  | Bik. |  | 299.00 Pair |
|  | Series <br> In-Wall Mini | In-Wall | 51/4 |  |  | 1/2 | Dome |  | $80-21 \pm 3$ | 87 | 10 | 4.5k | 8/6 | $12 \times 9$ | Wht. |  |  | 199.00 Pair |
|  | Audio Focus | Ctr Ch. | (2) 4 |  |  |  |  |  | $80-20 \pm 3$ | 92 | 10 |  |  | $6 \times 13 \times 6$ | BIk. VnI. | BIK. | 6 | 129.00 Each |
|  | Audio Cinema Powered | Ctr. Ch. <br> Powered Ac. Sus. | $\left\|\begin{array}{l} 624 \\ 2351 / 4 \\ 21 / 2 \end{array}\right\|$ |  |  | -1/2 | Dome |  | $\begin{aligned} & 60-20 \pm 3 \\ & 100-20 \pm 3 \end{aligned}$ | $\left\lvert\, \begin{aligned} & 21 \\ & 91 \\ & 95 \end{aligned}\right.$ | $\begin{aligned} & 10 \\ & 10 \\ & \text { Inc. } \end{aligned}$ |  | $\begin{aligned} & 8 / \\ & 20 \mathrm{k} \end{aligned}$ | $\begin{aligned} & 6 \times 18 \times 6 \\ & 6 \times 4 \times 3 \end{aligned}$ | Blk. Vnl. Opt. | $\begin{aligned} & \text { Bik. } \\ & \text { Opt. } \end{aligned}$ | 10 | $\begin{aligned} & 189.00 \text { Each } \\ & 109.00 \text { Pair } \end{aligned}$ |
|  | Partner AV22 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 109.00 Pair |
|  | Powered | Powered Ac. Sus. | (2) $21 / 2$ |  |  |  |  |  | $80-20 \pm 3$ | 102 | Inc. |  | 20k | $9 \times 4 \times 3$ | Opt. | Opt. |  | 229.00 Pair |
|  | Powered | Powered Ac. Sus. | 5 |  |  | 1 | Dome |  | $40-25 \pm 3$ | 109 | Inc. |  | 20k | $11 \times 6 \times 8$ | Opt. | Opt. |  | 399.00 Pair |
|  | Powered | Powered Ac. Sus.; | 6 |  |  |  |  |  | 50-200 $\pm 3$ | 106 | $\operatorname{Inc}$ |  | 20k | $6 \times 16 \times 14$ |  |  |  | 249.00 Each |
|  | Partner AV522 Powered | Subwoof. ${ }^{\text {Sowered Ac. Sus.; }}$ | 6 |  |  | $21 / 2$ |  |  | $50-20 \pm 3$ | 106 | Inc. |  | 20k | Three Pieces | Blk. | Bik. |  | 349.00 Sys. |
|  | Partner AV622 Powered | Sat. \& Subwoot. Powered Subwoot | $10$ |  |  |  |  |  |  |  |  |  |  | $15 \times 15 \times 15$ |  |  |  |  |
|  | Powered Subwoofer |  |  |  |  |  |  |  | $35-200 \pm 3$ |  | Inc. | Var. |  | $15 \times 15 \times 15$ | Opt. |  |  | 449.00 Each |
| AERIAL ACOUSTICS | 10 T |  |  | 51/4 | Cone | $\dagger$ |  |  | 28-22 $\pm 2$ | 86 | 100 | 360,2.7k | 4/3 | $42 \times 13 \times 19$ | Opt., Wood | Bik. Foam | 110 | 4995.00 Pair |
|  | 7 | Vented | 9 |  |  | 1 | Dome |  | $35-22 \pm 2$ | 86 | 50 | 22k | 4/3 | $41 \times 10 \times 14$ | Opt., | Blk. | 80 | 2795.00 Pair |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Wood | Cloth |  |  |
|  | 5 | Ac, Sus. | 7 |  |  | 1 | Dome |  | $60-22 \pm 3$ | 85 | 50 | 2.5k | 4/3 | $13 \times 8 \times 10$ | Opt., Wood | Blk. Foam | 25 | 1595.00 Pair |
| AES | AES-25M | In-Wall | $51 / 4$ |  |  |  |  |  | 70-18 | 88 | 10 |  | 16/8 | $12 \times 8 \times 3$ | Wht. | Wht. | 5 | 79.95 Each |
|  | AES-30R | In-Wall | 5\%/4 |  |  |  |  |  | 70-18 | 88 | 10 |  | 16/8 | $12 \times 8 \times 3$ | Plast. Wht. | Steel | 5 |  |
|  | A |  | 5 |  |  |  |  |  |  |  |  |  |  | 8 | Plast. | Steel |  |  |
|  | AES-50S | In-Wall | 51/4 |  |  | 3/4 | Dome |  | 70-20 | 90 | 10 | 3k | 8/4 | $12 \times 8 \times 3$ | Wht. | Wht. | 5 | 99.95 Each |
|  | AES-100S | In-Wall | 61/2 |  |  | 3/4 | Dome |  | 55-20 | 90 | 10 | 3k | $8 / 4$ | $12 \times 8 \times 3$ | Wht. | Wht. | 6 | 124.95 Each |
|  | AES-200S | In-Wall | 61/2 |  |  | 1 | Dome |  | 40-20 | 90 | 10 | 2.5k | 8/4 | $12 \times 8 \times 3$ | Plast. Wht. | Steel Wht: | 8 | 179.95 Each |
|  | AES-300W | In-Wall; Subwoof. | $6 \times 9$ |  |  |  |  |  | 28-90 | 90 | 10 | 90 | $8 / 4$ | $12 \times 8 \times 3$ | Plast. Wht. | Steel Wht. | 9 | 229.95 Each |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Plast. | Steel |  |  |
|  | AES-400W | In-Wall: Subwoof. | $6 \times 9$ |  |  |  |  |  | 28-90 | 90 | 10 | 90 | $8 / 4$ | $12 \times 8 \times 3$ | Wht. Plast. | Wht. Stee | 9 | 295.00 Each |
| ALIANTE | One | Vented | 61/2 |  |  | 1 | Dome |  | $45-32 \pm 3$ | 87.5 | 30 | 3.5k | 8/6.5 | $12 \times 14 \times 16$ | Wal. | Blk. Knit | 30 | 3000.00 Pair |
| ALLISON | AL-105 |  |  |  |  | 1 | Dome |  | $58.18 \pm 3$ | 90 | 15 | 2.5 k | 61 | $15 \times 10 \times 8$ | Opt. | BIk. Knit | 13 | 149.95 Each |
| ACOUStics | AL-110 | Ac. Sus. | 6 |  |  | 1 | Inv. Cone |  | $54.21 \pm 3$ | 90 | 15 | 2 k | 61 | $15 \times 10 \times 9$ | Opt. | Blk. Knit | 16 | 179.95 Each |
|  | AL-115 | Ac. Sus. |  |  |  | , | Inv. Cone |  | $41 \cdot 21 \pm 3$ | 90 | 15 |  | $6 /$ | $20 \times 11 \times 10$ | Opt. | Blk. Knit | 22 | 229.95 Each |
|  | AL-120 | Ac. Sus. | ${ }^{2} 26$ |  |  | 1 | Inv. Cone |  | $52-21 \pm 3$ | 90 | 15 | 100,2k | $6 /$ | $24 \times 11 \times 11$ | Opt. | Blk. Knit | 33 | 329.95 Each |
| (Continued) | AL-125 AL-130 | Ac. Sus. Ac. Sus. | $\begin{array}{r} 2 \\ (2) 6 \\ (2) 8 \\ \hline \end{array}$ | $\begin{array}{r} 31 / 2 \\ 31 / 2 \\ \hline \end{array}$ | $\begin{array}{\|l\|l\|} \text { Inv. Cone } \\ \text { Inv. Cone } \\ \hline \end{array}$ | 1 | $\begin{array}{\|c} \text { Inv. Cone } \\ \text { Inv. Cone } \\ \hline \end{array}$ |  | $\begin{array}{r} 48-21 \pm 3 \\ 35-21 \pm 3 \\ \hline \end{array}$ | $\begin{array}{r} 90 \\ 90 \\ \hline \end{array}$ | 15 <br> 15 | $450,4 \mathrm{k}$ $450,4 \mathrm{k}$ | $6 /$ | $\begin{array}{r} 31 \times 11 \times 12 \\ 38 \times 13 \times 14 \\ \hline \end{array}$ | $\begin{aligned} & \text { Opt. } \\ & \text { Opt. } \end{aligned}$ | Blk. Knit | 40 <br> 57 | $\begin{aligned} & 479.95 \text { Each } \\ & 599.95 \text { Each } \\ & \hline \end{aligned}$ |

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## No alterations required

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

THIEL's Coherent Source ${ }^{\circledR}$ designs preserve the time and phase information in the movie soundtrack, so
spatial information is accurately reproduced. Sounds come from specific points and nove realistically around a threedimensional soundstage. THIEL's exceptionally uniform tonal balance allows voices to sound natural and authentic, not nasal or constricted. Subtle details of a rainshower or a shoe striking the pavement are easily heard because of THIEL speakers' unusually high degree of clarity. From the impact of explosions to the quiet rustling of a leaf, THIEL speakers' wide dynamic range fills the senses with extraordinary realism.

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

## LOUDSPEAKERS



# The Velodyne 15" Subwoofer: Controlling Brute Force Through Superb Engineering 

High-output, low distortion bass response can only be achieved by creating and controlling the power of brute force. Perfection of such an accomplishment demands superb engineering, critical manufacturing, and dedication to ideals: A feat, according to the audio press and listeners worldwide, that has been attained only by Velodyne Acoustics.

More than a decade of engineering excellence has generated Velodyne's "High Gain Servo" speakers to the forefront of the audio industry.

Velodyne's patented speakers are built in-house, to the most exacting specifications, using the finest materials available. With their superb design, engineering, and errorcorrection electronics, Velodyne's subwoofers remain the standard by which all others are judged.

LOW MASS (2.5 GRAMS) ACCELEROMETER The brains of Velodyne's patented "High Gain Servo System,"
 this amazing device is mounted directly on the voice coil, and measures the actual movenent of the driver. The information is sent to a circuit, which makes corrections for any deviations from the pure input signal. This "error correction" circuit virtually controls the motion of the driver, and eliminates distortion.

## Velodyne <br> The Bottom Line In Bass

## Velodyne Acoustics, Inc.

1070 Commercial St., Suite 101 San Jose, CA 95112 408/436-7270 800/835-6396

## LOUDSPEAKERS




REFLYR:
WHERE DOES THE TWEETER OF A HIGH FIDELITY LOUDSPEAKER BELONG?

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

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

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

## LOUDSPEAKERS



# "Highest Performance. . .lowest profile." POLK AUDIO'S HIGH PERFORMANCE CENTER CHANNEL SPEAKERS 

"Some say that the center channel and the front stereo speakers must be identical. And they're right-to a point. You need high performance but not a monolith perched on your TV. Four years ago, our CS100, America's first dedicated center channel speaker, proved that technology could give you what you wanted-high performance in a versatile, unobtrusive package. Thanks to our newest technology, Dynamic Balance, the second generation of the CS Series now gives you the highest performance. . .lowest profile."

## Matthew Polk

Since all on-screen action, not just dialog, is reproduced by the center speaker, its performance is critical.
 on-screen action, from on explosion to a whisper, it is responsisible for over $50 \%$ of what you hear (often as much as $90 \%$ ). That's why Polk's center chonnel speakers hove full dynamic

Dynamic Balance ${ }^{\oplus}$ enables us to create small driver components that deliver the sound quality usually associated with much larger drivers. And because there's no sonic coloration, our center speakers will blend seamlessly with your other speakers so voices and sound effects will pass from speaker to speaker without changing timbre or pitch.

The uniquely angled, low profile cabinets and superior magnetic-shielding give our center channel
range ond ore designed to handle extreme levels of power.
speakers the versatility to fit anywhere you want them without fear of picture distortion. Select from the CS350, CS250 or CS200 for the right speaker to fit your system and your budget.

For more information on the Polk center channel speakers or any Polk home theater speaker, call 1-800-377-POLK or dial our toll-free dealer locator to find your nearest authorized Polk dealer. An audition will show you that Polk delivers on "highest performance. . . lowest profile."

## LOUDSPEAKERS



PSB invites you
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A selection of
rave reviews from the wority's
leading audio journals
e)

## Hear's what the Critics Say...

## PSB Alpha

Rolling Stone - June 1994
The Sensible Sound - Fall 1993
Stereophile - July 1992
Audio/Video Interiors - April 1993
AudioVideo (Singapore) - October 1993
PSB 300
Lyd \& Bilde (Norway) - August 1993
PSB 400
Stereo Review - December 1992

## PSB 500

Stereophile - July 1993
Lyd \& Bilde (Norway) - September 1993

## PSB Stratus Mini

Speaker Builder - Issue 3, 1993

## PSB Stratus Silver

Stereophile - July 1994
Inner Ear Report - Summer 1994

## PSB Stratus Gold

Stereophile - February 1991
Audio - November 1991
Sound \& Vision - January/February 1991


PSB STRATUS SILVER

PSB 100C Center Channel
Sound \& Image - Summer 1993
Sound \& Image - Spring 1994
PSB Alpha Subsonic Subwoofer
Sound \& Vision - June 1994

PSB Subsonic II Subwoofer
CD Review - January 1994
Sound \& Image - Summer 1994


PSB speakers are used in an impressive number of practical music applications, including the recording studio in the worldfamous Carnegie Hall.

PAUL BARTON developed the acclaimed line of PSB loudspeakers
with the aid of Canada's National Research Council laboratories (one of the most respected loudspeaker research facilities in the world). PSB loudspeakers have consistently won the acclaim of audiophiles, music lovers and audio critics from around the world.

The decision to invest in loudspeakers (the most important compo-
nent in any sound system), regardless of budget considerations, should



PSB ALPHA
never be taken lightly. To help your decision making, on the following
pages you'll find objective evaluation of PSB loudspeakers from some of the world's leading audio publications...



## Awards



## Sound\&Vislon

M A G A Z I N E
and its Technical Reviewers
present the
CAITIC'S CHOICE AWARD

## to

PSB Speakers for the
PSB STRATUS GOLD LOUDSPEAKER
in recognition of
Technical Excellence and Exceptional Value
in A. Brind
M. H. BRIANT

Publisher

Alandruft
ALAN LOFFT Editor

PSB won Sound \& Vision Critic's Choice Awards for its Home Theater System (PSB 100C Center-Channel Speaker, two pairs of PSB Alpha loudspeakers and a PSB Alpha Subsonic subwoofer); Stratus Gold; Stratus Mini; and Alpha loudspeakers.
 1993.

CD Review selected the PSB Subsonic II as one of the best audio buys of

## PSB continues to win important critical acclaim for superior loudspeaker performance...

## Product of the

 Year!PSB Stratus Gold and the PSB Alpha were recognized with the AudioVideo Int' \%. 1993 HI-FI Grand Prix Award.

CRITICS CHOICE


Sound\&Vision
MAGAZINE
and its Technical Reviewers present the
CRITIC'S CHOICE AWARD

PSB Speakers for the PSB STRATUS MINI LOUDSPEAKER
in recognition of Technical Excellence and Exceptional Value ins. Brin Alaw Uofry $\begin{array}{cc}\text { M. H. BRIANT } \\ \text { Publisher } & \text { ALAN LOFFT } \\ \text { Editor }\end{array}$ Publisher



The PSB Alpha has received critical acclaim from many sources, including AudioVideo Int'I., Stereophile and Sound \& Vision magazines.

LET'S NOT BEAT AROUND THE bush: The PSB Alpha is quite possibly the greatest loudspeaker bargain of the last 25 years...

So, just what is the PSB Alpha? It's a $12.75^{\prime \prime} \mathrm{H}$ x $8.75^{\prime \prime}$ W x $9.5^{\prime \prime}$ D two-way, vented loudspeaker system, using a 6.5 " polypropylene cone woofer, matched to a "poly-flare" dome tweeter by a third-order Butterworth crossover network, and mounted in an unusually rigid (for its price) but lightweight cabinet. Stands are required, and should be approximately 22 " tall. PSB recommends placement at 2 " or more from the back wall. Two inches provides the maximum bass response. However, placement further away from the back wall provides better imaging.

Paul S. Barton (PSB) designed the Alpha with the extensive aid of Canada's National Research Council (NRC) in Ottawa - probably the most highly regarded loudspeaker research facility in the world. While many fine loudspeaker designs have benefited from the NRC's facilities, none that I know of have succeeded this well and go for a measly \$199 per pair. Despite its low cost, the Alpha doesn't look cheap. It has a simulated black oak finish that's hard to distinguish from the real thing. The Alpha even uses heavy-duty terminals that accept cabling as heavy as 12 gauge, as
well as five-way dual banana blocks.

How good is the PSB Alpha? It's good enough to serve as a reference monitor for evaluating the sound of amplifiers. I used the Alpha extensively to decipher the nuances between various versions of the Dynaco Stereo 70 amplifier. It is good enough to fit in comfortably with systems consisting of some of the most expensive gear around. Yet, it sounds just fine in more modest systems - for example, when coupled with the \$299 NAD 7225PE receiver.

Perhaps one of the Alpha's greatest virtues is its lack of cabinet colorations. Having lived with Quad electrostatics for five years, cabinet colorations produced by conventional box speakers have become a personal pet peeve of mine. The Alphas perform better than box speakers in this regard, which is remarkable - especially considering how inexpensive it is. Finally, the Alphas excel in the area of spectral balance. Despite their size, these are not thinsounding speakers; nor, on the other hand, do they exhibit the BBC bass bump of the wellknown LS3/5A. The Alphas are about as even-handed in this regard as one can expect from a \$199 per pair compact loudspeaker. Is the Alpha faultless? No way. A speaker that uses a passive $6.5^{\prime \prime}$ woofer in a conventional cabinet that's barely over a foot tall is
going to have some bass limitations - and the Alpha is no exception. Bass extension is limited. However, under most circumstances the lack of bass extension is not a problem, because the Alpha is capable of reproducing a credible degree of mid-bass music with good impact and with a reasonable low amount of distortion. Moreover, the Alpha's resolution - while outstanding for its price range - is not outstanding when using an absolute standard (e.g., comparing it with electrostatics from Martin-Logan or Quad). We do have to remember, however, that these speakers cost $\$ 199$ per pair...

Judging by some of the comments I've heard from local audio dealers, the word of mouth is spreading on the Alpha. If PSB can resist the temptation to raise the price of its little wonder, it has the makings of an audiophile legend for the mid 1990 s.

## RN - Fall 1993

Excerpted with permission from Issue \#49, Fall 1993 of The \$ensible Sound. Subscriptions to The Sensible Sound are available for $\$ 20$ per year by check to 403 Darwin Drive, Snyder, NY 14226 or through Visa/MC by phone (716-839-2199) or FAX (716-8392264). You may also purchase a set of all available back issues (currently $30+$ issues) for $\$ 59$, shipping included.
"... the PSB Alphas are capable of actually playing bass convincingly, without being boomy and uncontrolled... the midrange was exceptional..."

## Audio Video (Singapore) October 1993

THE PSB Alphas are simply one of the greatest buys in audio, providing a musically satisfying sound for a paltry $\$ 200$. No, they don't have the wonderfully natural refinement of speakers costing many times their price. What they $d o$ have is much more of the real thing than any of us could reasonably expect from such an inexpensive pair of speakers. For their price, the PSB Alphas are a sensational audio bargain. Now get out those checkbooks!

Jack English - Stereophile, July 1992, Vol. 15, No. 7

IT ISN'T OFTEN THAT LOUDspeaker companies are guilty of underselling their products. But never judge a speaker by its size, weight, or promotional wrapping. Take, for example, PSB's diminutive, modestly priced (\$199/pair) Alpha bookshelf speaker. When I first scanned the printed pitch, I found myself fighting the old ennui: "... ideal for lower-powered systems... blah-blah-blah... apt as an extension speaker... blah-blah-blah well-suited for surround channels in home theater systems..." But when I finally hooked up a pair in my studio, the "I said I'd listen to them and now I'm doing it ${ }^{\prime \prime}$ ennui was out the window fast.

These are magnificent mites. Forget the hundred and ninetwnine bucks a pair. That's not the price range where designer Paul S. Barton's speakers should be vying for your attention. Among models this small ( 13 inches high by 9 wide and 10 deep), the only speakers I've encountered that can match the Alpha's solid bass response and power-handling capacity fall between $\$ 800$ and $\$ 1,000$ a pair. Yet, while the Alphas will play loud and respond to a high-powered amplifier, unlike most small speakers of such quality, they don't require a ton of power... In short, these black-clad beauties are a small wonder.

April 1993 - Excerpted with permission from Audio/Video Interiors

## RollingStone

PSB is a Canadian speaker maker as well as a smart human being named Paul S. Barton. Other manufacturers will tell you to get their speakers away from the wall to avoid muddiness. But Barton designed the PSB Alpha (\$200 a pair) to sit 2 inches from the wall, where its 6.5 inch polyproplyene woofer can bounce convincing bass through a backpanel port, off the wall, into the room. Even without the optional PSB Alpha Subsonic subwoofer ( $\$ 300$ ) or self-powered, 90 -watt Subsonic II subwoofer (\$700), this little speaker rocks and rolls in a small space, partly thanks to a low impedance rating of six ohms. (The fewer ohms, the more power the speaker will accept.).. And unlike competitors using potentially harsh metal tweeters, the Alpha handles highs using a sweet little plastic tweeter from France. For five-speaker surround sound, get an extra pair of Alphas and the PSB 100 C center-channel speaker (\$180).

Rolling Stone, June 16, 1994

## StereoReview.

## "The compact PSB 300 is a winner ...a great bargain, highly recommended"

## Lyd \& Bilde

## ('Sound \& Picture’ Norway) August, 1993

inch centers, recessed into the rear of the cabinet. They are compatible with single or dual banana plugs as well as wire ends.
We placed the PSB 400 on the optional 27 -inch stands, approximately 9 feet apart and 2 feet in front of a wall, for our room measurements and listening tests. The room-response curve, averaged for both speakers at a single microphone location, sloped downward slightly above 500 Hz but varied only $+/-3 \mathrm{~dB}$ from 300 to $20,000 \mathrm{~Hz}$.
The close-milked woofer response (including the contribution of the port) reached its maximum at 100 Hz , sloping downward at 6 dB per octave below 80 Hz and more gradually above 100 Hz . The composite response curve, which agreed fairly well with the sound quality of the speakers, indicated a smooth, gradual downward slope from 100 Hz to at least $5,000 \mathrm{~Hz}$, with a more uniform average output from 5,000 to $20,000 \mathrm{~Hz}$.

Response measurements at 1 meter on the tweeter's axis, with a swept one-third-octave band of pink noise, indicated a remarkably uniform output, varying only $+/-2 \mathrm{~dB}$ from 50 to $20,000 \mathrm{~Hz}$
and falling off precipitously at lower frequencies. That was generally consistent with what we heard from the speakers.

Other measurements, made with a variety of quasi-anechoic techniques, showed a rough agreement with the earlier measurements. Some of the peaks and dips in the measured response occurred at the same places in all the measurements, but the others did not necessarily coincide.

One fact was evident from all our data. Whatever the method of measurement, the response of the PSB 400 was strikingly smooth, with a typical output uniformity of $+/-2 \mathrm{~dB}$ from a few hundred hertz to $20,000 \mathrm{~Hz}$ (at lower frequencies there is unavoidable interaction with the room boundaries). The use of a . 75 -inch tweeter not only contributes to the system's extended high-frequency response but gives it better angular dispersion over its full frequency range. At 45 degrees off the tweeter's axis, the output dropped only 3 dB at $10,000 \mathrm{~Hz}$ and 8 dB at 20,000 Hz . Phase linearity in the tweeter's range was also excellent, with a total group-delay variation of

"The PSB 400<br>is a musical speaker... It is an example of what can be done with a modest budget and enclesure size in the current state of the loudspeaker art."

less than 100 micro-seconds from about $4,000 \mathrm{~Hz}$ to $20,000 \mathrm{~Hz}$ and about 200 micro-seconds at 2,000 Hz (close to the probable crossover frequency).

Impedance was a minimum of 4.5 ohms at 170 and 40 Hz and a maximum of about 17.5 ohms at 68 and $1,900 \mathrm{~Hz}$. Since the impedance fell below 6 ohms over much of the lower midrange, we would rate the system at 5 to 6 ohms. Sensitivity, with an input of 2.83 volts of pink noise, was 87

dB sound-pressure level (SPL) at 1 meter. With 4 volts drive (corresponding to a $90-\mathrm{dB} \mathrm{SPL}$ ), the woofer distortion was comfortably low, ranging between 0.6 and 1 percent over most of the frequency range from 80 to 2,000 Hz . It rose to 2 percent in the range of 45 to 60 Hz . The lower frequency limit of the PSB 400 could be rated at 45 to 50 Hz , which is very good performance for a single 6.5 -inch woofer in a small cabinet.
It would appear that Paul Barton has achieved his goal in the Model 400. Although we did not compare it directly with one of the PSB Stratus systems, we would hardly expect it to match their qualities. Nonetheless, it managed to sound like much more of a speaker than its dimensions, weight, and price would suggest. Both the quality and quantity of sound it can generate belie its appearance, and we have no doubt that if it were hidden it would be able to deceive many listeners into thinking they were hearing a far larger speaker.

But that is really besides the point. The PSB 400 is a musical speaker, unlikely to offend the sensibilities of the most critical
listener. It is also not going to cause financial hardship, nor mar the decor of any room that is likely to devoted to a music system. It is an excellent example of what can be done with a modest budget and enclosure size in the current state of the loudspeaker art.

Julian Hirsch, Hirsch-Houck Laboratories - December 1992

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"The PSB 500 is a new bestseller... performs with great power and control... PSB is guaranteed to have many fans."

Lyd \& Bilde ('Sound \& Picture' Norway) September, 1993


The PSB Stratus Mini was the recipient of Sound \& Vision Magazine's Critic's Choice Award


BECAUSE AFTER ALL THE ESsentials are taken care of overall balance, listenability, and lack of serious colorations - it takes something more to tickle the audio palate. Call it what you will, it boils down to a sense of life and three-dimensionality. There's no magic involved in achieving these things (they are not unrelated to those questions of balance and coloration). They simply require intelligent design plus a designer who is actually looking for them. Some loudspeakers have them, some don't. The PSBs have them to a satisfying degree. They have the same sense of dimensionality that I noted in my earlier remarks about the PSB 40 Mk .II. And they have enough presence, detail, and dynamic range to provide a believable feeling of aliveness without lapsing into an etched, analytic caricature.

## Thomas J. Norton -

Stereophile (PSB 500 review), July 1993, Vol. 16, No. 7

## sterotil

Recommended Components

Stereophile Magazine recommends both the PSB 500 and Stratus Mini loudspeakers.

The Stratus Mini is a classic case study in the design methodology required for producing a good sounding, anechoicallly flat loudspeaker, which makes it an ideal subject for an SB review. Before discussing the engineering details, however, I'd like to introduce the speaker's designer, Paul Barton.

Barton has been a major force in the growing number of Canadian loudspeakers in the US market.

The first manufacturer to use the NRC (Canadian National Research Council) anechoic chamber for design work, he was also one of the first to use com-puter-aided loudspeaker design software.

## Bottom Line

I admire the design and construction of the Stratus Mini very much. The excellent off-axis response and closely-matched drivers produce a good image character with a reasonable amount of depth. The dynamic range is really quite good and seemed better to me than some of the compara-bly-priced competition which use shallow-sloped crossover techniques. The Stratus midrange is neutral sounding; the high frequencies are clean and free of harshness or excessive sibilance.

The bass is well-defined and well-balanced, with good extension for a 6.5 " woofer. Using this speaker with the right subwoofer would give the bottom end the authority lacking in all $6.5^{\prime \prime}$ drivers.

Compared to some of my current work, which uses very expen sive 12-gauge air core inductors and beautiful poly caps in similar two-way design formats, the PSB Stratus Mini sounds embarrassingly good, cored inductors and NP electrolytics notwithstanding. If I were asked to recommend speakers in the $\$ 1,000$ /pair category, I would definitely include the Stratus Mini.

Vance Dickason - Speaker
Builder, Issue 3, 1993
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## "All of our listening panelists were stunned with the performance of the Stratus Silver loudspeakers... we all agreed that these loudspeakers represent one of the best values in the industry."

Inner Ear Report Summer 1994

ANOTHER SLENDER, FLOORmounted, tower speaker, the [PSB] Stratus Silver builds on the design and sound qualities of PSB's established Stratus Gold and Mini designs...The cabinet construction, as with other members of the Stratus family, is unique. The sides, front, and back are joined with tongue-andgroove aluminum extrusions. I don't know whether or not this provides any acoustical benefits, but it certainly results in a less boxy appearance than that of your typical loudspeaker...Our Stratus Silvers were finished in a striking, mirror-like gloss-black; several wood veneers are also available for those who don't like the wet look. The Silver's top end was detailed and very clean...At the opposite end of the spectrum, the Silver's bass response was surprisingly potent - not exactly what you'd expect from two pairs of $6.5^{\prime \prime}$ drivers trying to energize a $+5,000 \mathrm{ft}^{3}$ listening room...are honest performers and honest values in a tough market segment...belong solidly in Class C of our "Recommended Components" listing; I suspect that, under the right circumstances in the right systems, they
might embarrass more than a few Class B residents.. the PSBs played at surprisingly high levels without strain. The PSB's sensitivity was high...The PSB Stratus Silver's measurements are firstrate. Certainly nothing here contradicts the fine listening result... the PSB Stratus Silver loudspeakers will give a detailed, rewarding performance with an open, transparent soundstage, an extended bottom end which will only be materially improved by a good, well-matched subwoofer, and an even timbral balance... [the PSBs], I suspect, would also work well in a Home Theater setting. Though I used neither in that capacity here, I have a gut feeling that the Silver's immediacy might make them a particularly good match for this application. But I do recommend a subwoofer in such a system. I could live happily and long with these loudspeakers. So, I suspect, could many of you. In a field which seems to have gone over the top with prices these days, it helps to be reminded that good value is still an effective sales tool. I enthusiastically recommend that...the PSB be added to your loudspeaker shopping list.

Thomas J. Norton -
Stereophile, July 1994, Vol. 17, No. 7


PSB STRATUS SILVER


The PSBs presented me with an open, detailed, clear sound-stage, a solid low frequency foundation, airy, articulate highs, and an unmuddled, lowcoloration mid-range. Their sound is immediate and vibrant not pushy, but clearly not laid back either. They have a natural clarity and inner detailing which do not slight small-scaled instrument groups and vocals, but have the weight and impact required for dramatic, large-scaled works. I was particularly struck by the Stratus Gold's open, unboxy midrange. Voice was particularly well handled. 'Clarity without shout', my notes relate, and that seems to sum up my observations.

## Thomas J. Norton -

Stereophile, Feb. 1991, Vol. 14, No. 2

The Stratus Gold is the top of Canadian manufacturer PSB's loudspeaker line, which also includes models from $\$ 199$ to $\$ 2,100$ per pair. The Stratus Gold is a large, floorstanding tower system with a vented-box low end designed around a high-excursion 10 -inch woofer.
PSB was the first Canadian loudspeaker company to take advantage of the advanced testing facilities and scientific staff of Canada's National Research Council. The NRC... is a govern-ment-funded Canadian operation whose mandate is to help Canadian manufacturers be competitive in world markets. PSB has made extensive use of NRC facilities, including controlled listening tests in NRC's International Electrotechnical Commission (IEC) Standard listening room (after which both Audio's New York listening room and my own were patterned), to optimize the Stratus Gold's performance.

The appearance and the fit and finish of the Golds are excellent. My wife and family really liked the oak finish. Particularly handsome are the beveled top and base of the systent; it's quite obvious that they are made from solid pieces of oak, because the wood grain maintains continuity all
around the edge and along the bevels.

The Stratus Golds produced a very clean, balanced, wide-range sound that competed with my reference systems (B\&W 801 Matrix Series 2) on nearly an equal basis. Bass organ notes that had made my reference speakers stumble were handled without a whimper by the Stratus Golds.

The bass notes between 3:41 and 3:44 on track 15 of Dorian's very demanding organ version of Pictures at an Exbibition (DOR90117), when the organ is played all-stops-out during the finale, made my reference systems stumble. But the Stratus Golds handled the difficult passage without a whimper (and even higher playback levels!').
At $\$ 2,000$ a pair, the Stratus Golds provide considerable performance and first-class looks for the money. They should appeal both to the audiophile crowd, for whom accuracy, balance, and imaging are important, and to a wider audience that likes loud rock ' $n$ ' roll, for whom the ability to play loudly and cleanly is important.
D.B. Keele, Jr. - Nov. 1991

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## Sound \&Vision

BLIND LISTENING TESTS WERE conducted in the NRC/IEC listening room, using experienced listeners, who judged performance using a collection of highquality recordings of classical, jazz and popular music.

It is always difficult to put into

## "The Stratus

 Gold shows its pedigree... PSB continues, and indeed builds upon, its reputation for firstclass sound." words how something sounds, but a comment by one of our listeners, "a refined sound," seems to sum it up quite well, As always, opinions among our listeners varied with position in the room, but they expressed a lot of pleasure with the Stratus Gold. Large orchestral works were presented with authority ("big, open, well balanced"). Military bands came through with a "nice forward, open presentation." The low distortion and lack of power compression were obvious in high level passages, which were handled without stress ("relaxed, credible"), yet smaller works were conveyed with subtlety and timbral integrity ("chorus nicely balanced"). Solo voices seemed to be especially well "transported," without obvious chesty enhancements ("good male voice", "appealing vocal"). At the same time, bass performance was impressive, with the Stratus Goldshowing that it could plumb the depths of orchestral bass ("great bass drum"), jazz ("good acoustic bass"), and rock percussion ("solid pop!") with equal conviction. Our fussy listeners had a few criticisms, occasionally commenting on a slight upper-midrange coloration in chorals, and a little aggressiveness in brasses. These comments were moderate in tone, and inconsistent, a clue that room, program and other factors were probably at work. Stereo imaging was excellent, with a sound-stage that displayed considerable breadth and depth. There were well-defined instrument locations in small ensembles, and a credible sense of spaciousness in larger works. The Stratus Gold portrayed the spatial differences between recordings, a good sign that the speaker is not getting in the way.

Overall, the Stratus Gold shows its pedigree. Comments such as "no significant faults," "smooth," "clean," "clear," and "refined" are not commonplace in our tests. They confirm that PSB continues, and indeed builds upon, its reputation for first-class sound.

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Steraitib
Recammended Components


The PSB Stratus Gold enjoys extensive critical acclaim including AudioVideo International's 1993 Grand Prix Award, inclusion in Stereophile's Recommended Components, and Sound \& Vision's 1993 Critic's Choice Award.

# SOUND\&IMAGE. 



PSB 100C

In a Spring 1994 Sound \& Image ranking of 15 cen-ter-channel speakers priced at $\$ \mathbf{2 0 0}$ or less, PSB 100C ranked Number 1 of those with a horizontal design.


The PSB 100C was the recipient of Sound \& Vision Magazine's 1994 Critic's Choice Award.

RECENT STUDIES IN THE FIELD of Dolby Pro Logic sur-round-sound systems show that they operate on the principle of centrifugal force. Translation: the center-channel speaker is the source from which Pro Logic's power springs. This lofty position brings with it unprecedented responsibility, however.

A center channel has to anchor an incredible variety of sounds at the screen without ever sounding unnatural. Whispers and detonating dynamite, angelic choirs singing and hell hounds howling - all must sound real. With movie scores and music programs, a center channel has to distinguish between dissimilar instruments and similar ones (an even greater challenge). And a good center speaker will disperse its lifelike sounds to as much of the room as possible, without letting them wander from the screen.
At the same time, a center channel has to blend seamlessly with the other speakers in the system, or they'll fight among themselves and disrupt the illusion Pro Logic tries to create. This isn't a stretch when all of the system's speakers are part of a surround package or series designed by a
single manufacturer. But it takes a special center channel to coexist in harmony with speakers outside its immediate family. With these thoughts in mind, I wired PSB's 100C (\$179) into my reference system, placed it in front and center on top of my TV, and ran it through a gauntlet of programs with and without Dolby Surround encoding.

A quick physical turned up the vital statistics. At $7.5 \times 17 \times 6$ inches, it may make smaller TVs (25 inches or less) look top-heavy, but it fit my 32 -incher perfectly. Its 13-pound heft instantly conveys a sense of quality, this impression grew as I examined the 100C's cabinet; PSB (Dept. S\&I, 633 Granite Ct., Pickering, Ontario L1W 3K1; 905-8316333) obviously knows its craft. It's far from the flashiest center channel I've seen though: it looks like a... speaker, and it clashed a bit with the spacey contours of my TV. I also wondered whether the lack of an adjustable stand, which would have me "aim" the speakers output at my primary listening spot (a low, black-leather Ikea lounger), would hamper its performance.

It didn't. Basic Instinct the movie isn't a paragon of subtlety, but its soundtrack offers a good batch of contrasting sounds. One moment, Sharon Stone is opening the buttons on her blouse, the next her girlfriend is trying to run Michael

Douglas over with her Lotus. Cut to a naked Ms. Stone padding about her cliffside manse, which is soon followed by Michael Douglas punching out a coworker in a crowded police station. Later, Ms. Stone pulls a sweater off, and then someone (the suspense!) is plunging an icepick into George Dzundza's Michelin-man neck. Each of these scenes contains, alternately, extremely subtle sounds and garish, oversized ones - and the 100 C had to make all of the sounds appear natural and in proper balance. Piece of cake.

The 100 C also blended well with my other front speakers, which I alternated between the relatively well-designed detachables supplied with my TV and a pair of mini monitors. And despite being aimed about a foot over my head, all of the sounds corresponding to onscreen action were appropriately locked on the screen - even when I slid the lounger about 6 feet to either side of center.

Switching between a couple of live music videodiscs, Pink Floyd's The Delicate Sound of Thunder and a version of Verdi's Requiem, I discovered that the 100 C was equally at home with male and female voices as it was electric, electronic, and acoustic instruments. The 100 C also got very loud and pretty low when I wanted it to, and it never sounded strained (it's compatible with amps delivering a steady 10 to


CD Review selected the PSB Subsonic II as one of the best audio buys of 1993 .


The PSB Alpha
Subsonic has been
recognized as a
Sound \& Vision
Magazine 1994
Critic's Choice
Award Winner.

## SOUND\&IMAGE.

100 watts).
Finally, I succumbed to the obvious and slid Terminator 2 into my disc player. The shopping carts that get slammed by the semicab in the justly famous truck/bike chase scene sounded exactly like shopping carts getting slammed by steel and concrete (don't ask me how I know). The tak-tak-tak of Joe Morton typing on his computer was just as irritating as the real thing. And the bubbling of the superheated liquid steel that proved to be the T-1000's undoing was even more unnerving than the sound of the rabbit boiling in Fatal Attraction.

Then there's the movie's most repulsive moment: when the sadistic guard in the psychiatric hospital licks Linda Hamilton's face with his Guernsey-size tongue. It was so sickeningly real it made my skin crawl. That's what a good center-channel speaker is all about, and this speaker has the act down cold. Since home theaters operate on the principle of centrifugal force, PSB's ridiculously inexpensive 100 C makes a terrific source for all the excitement.

PSB's smallish Subsonic II (\$699) has a fairly typical design for this group: continuously adjustable low-pass crossover, fixed high-pass, and a phase switch. There's also an on/off switch, though the maker's outstanding owner's manual suggests leaving the Subsonic II powered. And while its performance was "only" average or a bit above average for this admittedly excellent group, that performance takes on a new meaning when you balance it against the Subsonic II's price. In any case, it kicked out some powerful jams with its max output of 104 dB SPL. And it measured all the way down to 26 Hz . While I thought it sounded a tad less powerful than my very favorites in this group, all kinds of music and videos were delivered gracefully and with lots of punch and very clean details. Talk about added value.

Tom Nousaine - Sound \& Image, Summer 1994

THE YEAR SAW A TEEMING host of new subwoofers hit the market. One of the best (and best values) is from Canada's PSB Speakers. The active Subsonic II combines a high-tech 12 -inch woofer and dynamic, high-power dedicated amplifier in a compact, 16 -inch cube. Performance is enhanced by an unusually sophisticated, fourth-order two-way crossover, and by dynamic controls that make bass distortion virtually impossible. The Subsonic I's ratings are impressive: a 35 Hz low-frequency limit $(-3 \mathrm{~dB} ;-10 \mathrm{~dB}$ at 25 Hz$)$, and 110 dB SPL maximum output in typical listening rooms. Equally impressive is the PSB design's price: $\$ 699.00$.

Dan Kumin - $C D$ Review, January 1994


After listening to many other speakers, the PSB Alphas proved far superior. Excellent performance and value.
C.H., Taipei, Taiwan
l've had many compliments on the sound quality of my PSB speakers - very clean, natural sound.
O.P., Oslo, Norway

I'm very impressed with your products. I bought PSB front, rear, center and subwoofer for my surround sound system. K.M., Seattle, WA

The best center-channel in its price range - keep up the good work!
G.L., Langley, B.C.

A music lover's dream. Thanks PSB!
K.L., Singapore

My PSB Stratus Golds sound and feel like live music - truly amazing.
M.H., Reno, NV

My PSB 300s are a winner! M.C., Macau

PSB Alphas are incredible great sound and price.
K.C., Bangkok, Thailand

Thanks to PSB Speakers in
Canada for making wonderful loudspeakers!
L.M., Malaysia

Great sound!
P.L., Austin, TX

They're great!
M.R., Baltimore, MD

PSB has excellent price/performance and I have recommended PSB to many friends. M.H., Montreal, PQ

Son très clair et précis.
M.G., Quebec, PQ

This is a fine subwoofer - keep up the good work!
M.F., St John's, NFLD

I'm impressed with the "box of thunder" I purchased. You should be congratulated for making an excellent speaker! G.D., Toronto, ON

Thank you. Well worth it! C.M., Edmonton, $A B$

My Golds sound great with all kinds of music.
C.G., St. Charles, IL

Great rear speaker for surround sound!
S.O., Exeter, NH

I'm very pleased with my
Alphas. Their compact size and quality sound just "blew" me away. Thanks.
J.H., Miami, FL

The Alphas are unbelievable!
They easily offer the most bang for the buck of any speaker in their class.
N.E., Hayward, CA

The performance of these speakers (Stratus Silvers) far outmatched comparatively priced modets - get the word out!
M.B., Detroit, MI

My all-PSB speakers surround system is great - thanks! P.S., Pasadena, CA

My PSB Center Channel is wonderful. I'm saving for the PSB Subsonic II.
E.J., Columbus,OH

The workmanship and quality are excellent!
S.C., Gainsville, FL

Very pleased with the performance of my PSB Subsonic II. Excellent sound, clean, deep bass. One of the better additions to my system. Thanks! B.K., Boise, ID

They are the best speakers I've ever had. They sound great and they are great value.
A.N., Santa Fe, NM

Wow! I can't believe the sound quality of my all PSB home theater system. I will definitely be spreading the PSB word to my friends.
S.C., New York, NY

I'm enjoying the PSB Subsonic III; it enhances the sonic performance of my existing system, especially for video application.
S.T., Memphis, TN

On my friend's recommendation I bought a pair of PSB 600s - great performance/ value in an elegant, slim design. Thanks PSB.
V.L., San Francisco, CA

Thanks to the helpful sales staff - my PSBs sound fantastic.
P.A., Verona, N



## Sound Lab: Latayette

 KS-Advance Audio:Wchita $\rho$ Kiets $A N$ WChita $\cap$ Kiels AV: Lewrence $\mathrm{K}^{\boldsymbol{w}}$-Unlimited Sound: Lauisville
MA-Essential Hi Fi:
Cricopee $\diamond$ Goodwins
A J: Bosion
MD-JS Audic: Burtonsville
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TX-Audio Concepts
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## LOUDSPEAKERS



## WEST <br> LEFT



NBS 1
PRECISION AUDIO (805) 523-3005
5140-C COMMERCE AVENUE MOORPARK, CA 93021

## EAST <br> RIGHT



NBS 1
SOUND by SINGER (212) 924-8600
18 EAST 16TH STREET NEW YORK, NY 10003



$\frac{10}{4}$
UNI-Q DRVER TECHNOLOCY LETS EVERYONE BEIN THE "SWEETSPOT."

You need three front speakers - left, right and center - to achieve realistic home theater. A stereo pair would place the dialog in the center (where it belongs) from only one listening position. You can't use conventional hi-fi speakers for the center channel, even shielded models, because their dispersion patterns prohibit raising them too high or laying them on their sides.

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The Uni-Q driver. One of a series of KEF scientific achievements dedicated to one goal: the most realistic performance in your home.




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## LOUDSPEAKERS



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## ..and an ear for music

"(MG 10's) have an elegant appearance of a product that has 'class'...you are propelled into a new dimension--a dimension of incredible finesse...a musical experience that was mystical for me....(for home theater)... it can create a better audio illusion for movies than the picture can create a video illusion"...

Fedelta Del Suono, Italy, January, 1994

Thin-film speaker technology never looked better. The 10-1/2 inch wide Magneplanar ${ }^{\circledR}$ MG 10 is a sleek, diminutive dipole speaker that uses quasi-ribbon technology.

Circle the reader service card for reviews on the MG 10 and find how it's possible to satisfy an interior decorator, movie buff and audiophile with the same speaker.

## III MAGNEPAN

## LOUDSPEAKERS




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## Matthew Polk

The M5's high performance sound will simply astound you. You may choose to use the M5 as a surround speaker in your home theater system or as a remote speaker for other rooms of your home. That's because it's a product of the same groundbreaking technology, Dynamic Balance, used to develop our critically acclaimed flagship speaker, the L.S90.

No need to worry about where to put it. The M5's built-in bracket and unique shape give you endless placement options while its award-winning styling enhances your decor:

For more information on the M5, other M Series
speakers or any of Polk's home speakers, call 1-800-377-POLK. Or dial our toll-free dealer locator to find your nearest authorized Polk Audio dealer. An audition of the M5 will open your mind to the possibilities of
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Ad code: 20007

## LOUDSPEAKERS



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## LOUDSPEAKERS




## Performance with Style

Are you getting the most out of your speakers? Did you know that proper mounting and room placement dramatically improves sound quality? Most major speaker manufacturers recommend loudspeaker supports for optimum performance; many of the best known brands specifically recommend or use Sanus Foundations®. Demand the most from your audio dollar. Give your music a Sound Foundation!

## Natural Foundationse

Natural Foundations are constructed of MDF and finished with three coats of hand sanded black lacquer. MDF is quieter and stronger than other wood products, and is the cabinet material used in the best loudspeakers. All models feature brass speaker isolation studs, adjustable floor spikes, neoprene isolation pads, and a concealed speaker wire path. Two models are available with solid oak or walnut pillars.

## Designer Foundations®

Designer Foundations are a contemporary alternative to the utilitarian look of most steel loudspeaker supports. Performance is on par with the finest European and domestic designs, yet the price is affordable. Designer Foundations feature fillable steel pillars, adjustable floor spikes, HDF top plates, neoprene isolation pads, and brass speaker isolation studs.




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Your ears have an amazing memory, which is why you seek a loudspeaker that's as unforgettable as live music.
Had nature intended sounds to travet only forwart, acoustics would be a simple scierce.
Unlike conventional speakers, Mirage's M-si Series
Bipolar loudspeakers set the music free over a full 360 degrees. It's only natural.
Because what defines the sound of music is as much the physicalspace surrouncing them as the instruments themselves in reproducing music, a loudspeaker must place you, the audience, in that space. Mirage's Bipolar speakers do just that. But before you audition the M-si Series at your Mirage dealer, takke in a live concert or two. Then yout can experience for yourself just how Scewneunforgettably life-like the M-si's really are.

## LOUDSPEAKERS



## LOUDSPEAKERS



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Many Audio enthusiasts are scarching for a modest cost speaker system with the dramatic sound of costly floor standing units. Madisound believes the Cygnet approaches this ideal. It utilizes an cight inch woofer and a 1 " fabric dome twecter. These Peerless drivers are part of the prestigious CC series, and it allows the Cygnet to perform above 105 dB and reach bass notes below 40 Hz .

The cabinet is a luxurious Oak veneer with solid $19.0^{\circ}$ rounded corners, and is available in a Clear or Black Stained Oak Finish. This kit comes with black grills, and can be assembled in an
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The Cygnet looks and sounds like the most sophisticated commercial systems, and your friends will know you built them only if you admit it.


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Woofer: Dynaudio 15W75, 3 inch voice coil on a cast frame 5 inch woofer- exceptional power capability and bass clarity.
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Crossover: 6dB - Phase and
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## LOUDSPEAKERS



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You'll see and hear why QUART Home Theater speakers are a breed apart. Our CTR CENTER CHANNEL, for example, achieves a higher level of dialog definition and localization by not conforming to popular dual driver designs. Our SUB TEN marries a 10 " woofer with a IOOW amplifier-yet is priced lower than other subwoofers that offer far less in terms of both sound and power. To stand up
to the dynamic demands of surround sound, we created the rear channel POINT FIVE, with a special titanium dome tweeter and long excursion 6.5" woofer, and the QUART 250, with angled cabinets that mirror each other for proper mounting on opposite side walls. In-wall models are also in the MB QUART Home Theater lineup.

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"...This sub also added a great deal of clean and subtle depth to orchestral music that has lots of lows."
"...Everything sounded great with this sub, which went all the way down to 23 Hz in my living room ... and blasted out 104 dB SPL when playing solo."
"...A bravura performance."

## LOUDSPEAKERS



Thapered ro tuck nearly into corners and under caves, the OS-10 comes with a clever pivoting bricker that provides endless mounting solutions.




Tough enough for marine applications and heach-front living. Exceeds milicary anci-corrosion specs (MIL_STD-883D).


ElastoDynamic ${ }^{\text {rM }}$ Hybrid Dome Tweeter Impervious to moisture, Niles' unique tweeter designoffers extended frequency response with stunning detail and clarity:

Niles' speaker engineers are driven to design the very best. The result is unparalleled performance-sonically, visually, and functionally. The Niles OS-10 Indoor/Outdoor Loudspeaker will exeeed all of your expectations.

Sonically. 'The OS-10 handily outperforms many traditional bookshelf speakers. Much of its superb sonic character comes from its unique tweeter design. Constructed from a composite matrix of elastomers and
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Visually. The OS-10's aerodyyamic shape speaks for itself. But what may not be readily apparent speaks just as loudty. The OS-10's

tapered enclosure tucks neatly into corners or under eaves, complementing any decor, inside or out. Its clever pivoting bracket (standard equipment on the OS-10) gives you endless mounting solutions. Available in white or black, either finish is paintable for a truly custom look.

Functionally. We don't take the term "weatherproof" lightly. The OS-10 is designed to withstand extreme climates-from Minneapolis to Miami. Its rugged, non-resonant cabinet is totally sealed (insects or moisture can't creep in) and will not fade under the sun's rays. The grills and brackets are
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 and Architecture


## "More Bass. Less Space." INTRODUCING POLK AUDIO'S REVOLUTIONARY POWERED SUBWOOFERS.

"Although there's nothing as exciting as the explosive bass you get from movie effects, there's nothing so frustrating as dealing with those giant subwoofer cabinets. Especially since they're unattractive and impossible to hide. So I wondered why big bass couldn't come in smaller packages? What we needed was new technology. So I created it and I named it: bigh velocity compression drive. ${ }^{\text {™ }}$ At last I can give you what you've always wanted - more bass in less space."

## Matthew Polk

"Bone shaking." That's what Rich Warren of the Cbicago Tribune said when he heard our new subwoofers with their patented technology. The new Polk powered subwoofers, the PSW100 and PSW200, provide astoundingly deep, powerful bass.

And thanks to our new technology, you'll no longer have to buy a BIG subwoofer to enjoy BIG bass. In fact, our powered subwoofers will fit into your furniture! That's certainly revolutionary.

For more information on the PSW100, the PSW200 and other Polk home speakers, call 1-800-377-POLK. Or dial our toll-free dealer locator to find your nearest authorized Polk dealer. Just audition our new powered subwoofers to understand how Matt Polk delivers "more bass in less space."


The Polk PSW powered subwoofer will fit into your furniture. The PSW 100 is ovoilable in white ond block. The PSW200 is ovailoble in block.

## LOUDSPEAKERS



## PUT YOU <br>  <br> TV



CINESAT.2 REAR
SIDE IFFET SATELITE Speaker

The average TV is a 98 lb . weakling when it comes to sound. In fact, even when they're beefed up with stereo speakers, today's TV's just don't have the muscle to put you in the picture. What you need is the added strength of a new Sound Dynamics


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Canada H8T IAI
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Chandler, Ariz. 85226
FAX: (602) 899-8963
Don J. Cochran, Inc.
1900 Embarcadero, \# 109 Palo Alto, Cal. 94303

Coda Technologies
9941 Horn Rd., Suite A
Sacramento, Cal. 95827
FAX: (916) 363-4627
Cogent Research
25106 Via de Anza
Laguna Niguel, Cal.
92677
FAX: (714) 495-6712
Colletti Speaker Systems
P.O. Box 62

Port Allen, La. 70767
Community Professional
Sound Systems
333 East Fifth St.
Chester, Pa. 19013
FAX: \(16101874-0190\)
Concentric Speaker
Technology
51 Miriam Cir.
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85 High Technology Dr. Rush, N.Y. 14543

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2281 Las Palmas Dr.
Carlsbad, Cal. 92009
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\(197-09\) Jamaica Ave.
Hollis, N.Y. 11423
Credo
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Crest Audio
100 Eisenhower Dr
Paramus, N.j. 07652
FAX: (201) 909.8606
Crosby Audio Works
101 North First St
Suite 103
Los Altos, Cal. 94022
FAX: (408) 732-8107
Crown
1718 West Mishawaka Rd
Elkhart, Ind. 46517
FAX: 1219 ) 294.8329
CSI
Components
Specialties
P.O. Box 624

Lindenhurst, N.Y. 11757
Curcio Audio Engineering
P.O. Box 643

Trexlertown, Pa. 18087
FAX: (215) 481-3772
Curle Acoustics
P.O. Box 14731

Fremont, Cal. 94539
FAX: (800) 798-2834

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Reading, Pa. 19604
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Suite 336
Huntington Station, N.Y
11746
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Dana Audio
8807 Kingston Pike
Knoxville, Tenn. 37923
FAX: (615) 354-3298
Day Sequerra
535 Getty Cl .
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03461
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222 New Rd.
Parsippany, N.J. 07054
Derek Speaker-Sculpture
2 Division St.
New Rochelle, N.Y. 10801
FAX: (914) 576-2896
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See Audio Potentials
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DGX Audio
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Glenpointe Centre West 500 Frank W. Burr Blvd. Teaneck, N.J. 07606
FAX: (201) 092-7757
Digital Domain
300 East 90th St.
Suite B
New York, N.Y. 10128
FAX: (212) 427-6892
Digital Phase
2841 Hickory Valley Rd.
Chattanooga, Tenn. 37421
FAX: 1015\()_{894-1778}\)
Dimexs
P.O. Box 37, Station E

Montreal, Que
Canada H2T 3A5
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28 Beardslee Rd.
Millstone, N.J. 08876
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San Diego, Cal. 92129
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Bozeman, Mont. 59771
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Butler, Pa. 16001
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1275 Vicente Dr., \#189
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11746
Mavrick
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Fair Lawn, N.J. 07410
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Champlain, N.Y. 12919
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Scottsdale, Ariz. 85258

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2125 Central Ave
Memphis, Tenn. 38104

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334 King St. East
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255 Executive Dr.
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    The Cover Equipment: KEF Q-70 speakers flank the Magro 24 component stand, CD rack, and console, which holds, from top, a Sony CDP-CX151 CD player, a Fosgate-Audionics Model Four surround processor, Counterpoint's HC-818A multi-zone preamp and HC-808A surround processor, Yamaha's KX-580S cassette deck, and Ayre's V-3 amplifier. Atop the right-hand speaker is a JVC XM-DI MiniDisc recorder.

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