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BEAUTY IN FORM;
BEAUTY IN SOUND

SONUS FABER'S STRADIVARI SPEAKER

REVIEWS
UNIVERSAL DISC PLAYER from McCormack
CUTTING-EDGE DIGITAL from dCS
GREAT-SOUNDING SPEAKERS from Amphion, Triangle, BG, & Paradigm

2004 REVIEW INDEX

AUDIO ENGINEERING
KEITH HOWARD ENTERS THE TIME DOMAIN

MUSIC
ALTERNATIVE TUNINGS
GUITARISTS
MORIS TEPPE
BUDDY MILLER
JAMES BLOCH
Mirage's evolutionary NANOSAT system merges an awe-inspiring surround sound solution with leading edge industrial design. Featuring Mirage's exclusive OMNIPOLAR™ technology, NANOSAT allows for 360 degrees dispersion; creating a large, deep sound field that is unachievable by forward radiating speakers. This technological leap enables the system to achieve perfect blending between multiple satellites which results in a truly superior home theatre experience.
For more information on the NANOSAT and our dynamic range of OMNIPOLAR™ speakers, visit us online at www.miragespeakers.com
The concept of the new Contour line updates the classic tradition of the previous range, while bringing to life a completely new landscape of sound. This was the development goal for the new Dynaudio Contour models, an ambitious target that could only be realized through drawing on the company’s 25 years of experience in engineering advanced loudspeaker designs and its strong focus on research and development. The synergy of Dynaudio’s advanced driver technologies and furniture-grade cabinets, built from the finest materials, hand-crafted to the highest degree, and precisely manufactured to the tightest tolerances, leads to a level of quality that simply brings to life the essential nature of sound - the nature of feeling is reflected in the passion of music.
H
aving just spent the last four days at the 2004 Audio Engineering Society conference in San Francisco, I was struck by the sunny enthusiasm shared by many industry professionals for 5.1-channel surround-sound music.

We've got a smattering of provocative multichannel releases trickling out on SACD and DVD-Audio, and hordes of 5.1 home-theater systems sold, but I don't remember seeing a survey anywhere, ever, that said that the greater music-buying public would purchase more discs if someone would only add surround. Nor do I remember ever seeing information anywhere that the public at large (the small population of audiophiles aside) would buy more music if it were in higher resolution. That was a lesson learned the hard way.

I do remember seeing several surveys, including ones we've conducted on our own website, that reveal the two primary reasons music fans aren't buying more discs: price (they're perceived as too expensive unless they drop to under $10 per disc) and a dearth of inspiring new releases. Plus, modest but increasing numbers of consumers are abandoning discs altogether for music servers, iPods, and such services as iTunes — none of which will offer multichannel potential anytime soon, and the future popularity of which is supported by plenty of data.

Nonetheless, the music industry's hunch is that surround sound is a compelling feature. It was a big theme at AES, with seminars devoted to optimizing center-channel use in music, mastering for surround, celebrity surround panel discussions, and more. To make this happen, many of the event participants say they will now be pushing DualDisc; as a Warner Special Products producer noted during one of the panel discussions, "DVD-Audio will disappear."

However, there may be real trouble already festering in DualDisc paradise. First, the obvious: The slightly thicker discs will get stuck in some slot-loading CD players. Any customer who has to have his car dealer extract a Dual-Disc from his car system is a customer lost forever.

Let's also reflect on why the playing time of a DualDisc's CD layer is limited to 60 minutes. To enable the disc to have two readable sides and still remain slim enough to play in most machines (except as noted above), the substrate layer of the CD side must be half the thickness (0.6mm) of the "Red Book" specification (1.2mm). The trouble with a thinner CD layer, though, is that it will generate a higher error rate for a significant number of players, which will not be able to precisely focus their lasers on the now closer pits. The workaround for this is to stretch out the data pits, which forces the player to spin the disc faster, hence the shorter playing time. "Red Book" CDs can cram up to 80 minutes of music onto a disc — a full 20 minutes more content than the CD side of a DualDisc.

Beethoven's Ninth will now have to be sliced and diced.

"THE BUSINESS MODEL IS NOT THE BUSINESS."

—JOHN ATKINSON

Here's the interesting part: Industry insiders admit that, even with the pit fix, a DualDisc CD layer causes the error correction of your player to work overtime while deciphering the slightly fuzzy pits and lands on the disc. The CD layer of a new DualDisc is basically equivalent to an unwashed and somewhat slightly dazed regular CD that's five years old.

You read right: A new DualDisc begins life as a scuzzy pre-aged CD and goes downhill from there. Two major equipment manufacturers have already sent out service bulletins warning about their players' potential compatibility problems with the thicknesses of DualDiscs and CDs.

Then there's the brilliant management folk at Philips, who are seemingly proud of the fact that an SACD layer will never, ever be able to play on any computer. As the youth market zigged to the desktop PC, portable players, self-made mix discs, and media servers, Philips decided to zag in the opposite direction, full speed ahead — and, in the face of abject failure, continues to do so. At the San Francisco AES conference, a famed recording engineer and equipment manufacturer summed up the impact of SACD over the last five years thusly: "Sales did not happen." Note the past tense.

Here's what the music industry is currently thinking: With SACD and DVD-Audio down for the count, let's launch the DualDisc and hope that gluing surround sound and video onto a CD will do the trick. And still these formats sport restricted content (labels are increasingly monkeying with the CD layer to severely limit how you can use it), are not "portable" enough to use in any player you might want to play it in, not compatible with media servers, can't be easily iPodded...

What gives? Who thinks up this stuff? Who then decides that the public will embrace it? Are record execs living in 1979, when portable players, the Internet, and easy-to-use-and-copy CDs didn't exist? This is also the generation of the 1984 Betamax case, in which the movie industry fought VCRs tooth and nail, only to discover that they created more wealth than they could have imagined. If the Betamax case and its outcome prove anything, it's that embracing a media revolution is the better long-term strategy, even if the old business model must be changed or even abandoned. As John Atkinson is fond of saying, "The business model is not the business."

Here's the surefire strategy for staying in the game: Figure out what folks will want and create a great way to provide it at the right price. Here's the doomed strategy: Focus on what you want, and keep foisting it (or its next variation) on the market, piling failure upon failure.

This is obvious to a lot of people, but apparently not to the music industry. My suggestion to record execs: Listen to the music you're producing and listen to the formats you're choosing. But most important, listen carefully to your customers.
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- Marc Mickelson and Roger Kanno, SoundStage! on the S8
So that's why...
Editor:
In the October 2004 Stereophile (p.5), John Atkinson quoted the magazine's founder, J. Gordon Holt, as saying, "Let's face it, we recommend way too many components." That's because you guys are a bunch of ass-kicking, back-slapping, corporate whores who would sell your grandmothers for the price of a half-page, four-color ad. KCA ronin524@voyagernet.net

Boy, did you get up on the wrong side of the bed, KCA. I suggest you turn on your system, put on your favorite CD or LP, and chill out. But if you really feel this way, why do you read Stereophile at all? -JA

Shame on you
Editor:
Shame on you, Mikey and Barry! You may have missed a golden opportunity to convert an audio techie to an audiophile ("Analog Corner," October 2004). Maybe Walter Mossberg from the WSJ has never listened to a good audio system. So, if you haven't angered him to the point that he is not returning your e-mails or phone calls, why don't you arrange to take him to lunch close to a high-end audio store and then show him some good stuff? Or, better yet, find out what music he likes, invite him to your home, mix up a pitcher of margaritas, sit him down in the "sweet spot," and show him what he is missing out on. Randy Alfrey ralfrey@sbcglobal.net

Taking the biscuit
Editor:
There are many things one reads about in Stereophile about which one might conceivably compose a vigorous letter or two to the editor, but most of us are usually content to warm the bench and let others have a go at it. This one, however, takes the biscuit.
I refer to Wall Street Journal technology columnist Walt Mossberg's letter to Michael Fremer ("Analog Corner," October 2004, pp.41-42) and Mossberg's stunningly boneheaded refusal to help his readership become more educated about the differences between good- and bad-sounding audio equipment.

What is it about audio that draws such resistance, even ire, from some quarters? There are writers, perhaps even in the pages of the WSJ, who would extol the virtues of a Stradivarius violin, yet instinctively dismiss a Sonus Faber Stradivari Homage speaker as an elitist extravagance. Doesn't a Stradivarius cost orders of magnitude more than a Stradivari Homage? Are they both not exemplars of craftsmanship, both sculpted to make transcendent music? What exactly is going on?

Perhaps some writers fear that conceding that one audio product sounds better than another would put them on a slippery slope toward the cultish end of things, where the quest for perfect sound beckons one to spend a google of dollars on the state of the art. I don't buy that as a justification for Mossberg's philistine posture toward audio. I am certain one could find, in past issues of the WSJ, half-gloating reviews of assorted Bentleys, Gulfstream G-series jets, and other examples of ultra-high-end transportation. I don't see any resistance against that slippery slope.

It is not even as if Mossberg's point is that audio shoppers should buy only super values, such as the NAD CS20 BEE amp or the Epos EL5-3 speaker. He seems instead to be saying, "We're the Plastic Computer Speaker Brigade, we're proud of it, and we plan to stay that way." In the Wall Street Journal! Extraordinary. Although Fremer did not excerpt large amounts of Mossberg's letter, there is an undercurrent in Mossberg's remarks that seems to imply that the entire enterprise of shopping for audio-grade components is a self-indulgent, time-consuming exercise, and that genuinely responsible, hardworking businesspeople sublimate such wasteful desires by sticking only to work-oriented sound systems: essentially, computer speakers, iPods, and iPod add-ons. Yet, as Fremer points out, the WSJ's cultural coverage celebrates quality, even connoisseurship, in virtually every area of consumer life — other than audio.

Interesting how some disciples of Freudian sublimation wouldn't think twice about dropping major cash on expensive wine or symphony season tickets — or, in Mossberg's case, Havana cigars and whatever else he indulges with his impressive paycheck.

Why do self-styled, armchair pseudo-proletarians like Mr. M. almost never begrudge consumers — or themselves — their taste for higher-end products, except when it comes to audio? And just how did the WSJ guru conclude that his generally affluent readers are perfectly happy with MP3s played on cheap computer speakers and see absolutely no need to upgrade, if he and others like him never offer their readers any real alternatives? It seems that it is people like Mossberg, rather than reviewers like Fremer, who are on a crusade to push an agenda-driven point of view in the absence of evidence...

For more than a decade, Mossberg's insights about new products have had enormous influence on many companies' fortunes, and I believe he fancies himself as some sort of ex-hippie on a campaign to democratize technology and make it nongeeky, user-friendly, and accessible, which is a worthy goal. But his insights are valuable and constructive only when they are fair, not when they are filtered through and distorted by generalized resentment against an industry segment and hobby that he irrationally believes requires esoteric "niches" knowledge to appreciate. As Fremer put it, when he laid bare the disingenuousness of Mossberg's defense that he doesn't comment on sound quality because he is not an audiophile: "One need not be a gourmet to know the difference between a fine meal and one from McDonald's."

It is irresponsible of the WSJ to continue to do nothing about such churlish and unjustified bias from one person with a huge bully pulpit against one segment of the consumer economy. Well-selected audio gear has the capacity to bring real pleasure to many, if grouches like Mr. Mossberg don't steer them away for unfathomable personal reasons.

Wait, listen to some really good-sounding equipment, and just write about what you hear — assuming you can hear the difference. There is nothing snobbish about helping others learn how to put together a great $4000 audio system when they have Bimmer's sitting in their garages. There is more to audio than iPods and MP3s.
Franklyn Ayensu fayensu@hotmail.com

Show us some love
Editor:
How do we get the attention of the companies who supply us with music? When
years: first 45s, then LPs, then (perhaps) 8-
will they start listening to customers and
player. One would think there would be a
playback system. Stereophile has published
ber issue (p25) about the growth of the
Editor: they going to show us some love? Steve Joyce
their customers with lawsuits? When are
ing ways to charge more, make their prod-
more. Stereophile how many different versions of
SACDs or DVD-Audios of our favorite
music lovers may have bought over the
technique inferior copy-protected CDs of my
all of my music. Now I have to put up with
loaders steal their "intellectual property." This implies that the
quality of the music is nothing — it's the
that costs all the money. Now the music companies are crying foul as down-
aders steal their "intellectual property."

They can't have it both ways. As an audiophile, I don't download. I have bought
all of my music. Now I have to put up with sonic-ally inferior copy-protected CDs of my
favorite artists, which annoys me even further. In addition, here in Canada, we pay a
levy on every blank cassette and recordable CD. This goes to the music companies to
help compensate them for their losses. And don't get me started on the costs of concerts!

As a paying customer, I am not feeling very loved, yet I keep coming back for
more. It's the greed and marketing short-sightedness of the music companies that have
led us to the current situation. What are they prepared to do about it, besides
finding ways to charge more, make their products more difficult to use, and threaten
their customers with lawsuits? When are they going to show us some love? Steve Joyce
Waterloo, Ontario

Give me a server

Editor:
I was interested in the news in the Octo-
ber issue (p.25) about the growth of the market for music servers — devices that can
accept music streamed over a network connection from a PC and play it through a
home music system. This brings up the broader subject of an all-in-one music
playback system. Stereophile has published some bold articles — for example, your
reviews of the Apple iPod and the Card-
Deluxe PC soundcard — that dared to
tackle the dreaded C-word: gorgeous.

I am amazed that the audiophile com-

munity and equipment manufacturers haven't embraced the idea of a hard-
disk-based music jukebox or audio server as a replacement for the venerable CD
player. One would think there would be a huge market for a "high-end" box geared
toward audiophiles that would store
someone's music collection on a huge
hard disk in uncompressed or losslessly
compressed form. In addition to the obvi-
ous convenience of having one's music
collection easily available without having
to change discs between albums, it seems
as if there would be sonic benefits as well.
I am no engineer, but I would intuitively
think a hard disk could serve a digital
music stream with equal or less jitter
than a CD transport.

Since the manufacturers seem to be
asleep on this concept, I decided to build
my own digital music server. I bought a
used CardDeluxe on eBay for $150 and
am going to stick it in an old PC with a
super-quiet power supply and a very quiet
Seagate Barracuda hard disk. I am going to
save my entire CD collection as WAV
files. I will then hook up the PC music
server to my Musical Fidelity integrated
amp and enjoy high-end sound from the
CardDeluxe with the convenience of easy
to my music collection.

I can't be the only audiophile out there
who is tired of getting up to change CDs
after every album. Maybe I should start
my own company to sell these things. Maybe I
can stack CardDeluxes in quiet PCs with
some gold trim and sell them for $6000 each as high-end playback devices. Anyone want to
invest? Andrew A. Edmonds

Poor man's room correction

Editor:
Inspired by some recent articles in The
Allahrah Sound, I decided to try room
correction...for free.

I started with my basic music-server
setup: M-Audio Digital iO card on my PC,
optical cable to a Monarch deejiter box, coax/S/PDIF from my preamplifier.
I use WinAmp as my playback software, set
to DirectSound mode (which I know to be
bit-accurate, due to the fact that I can play
a DTS-encoded WAV file and the preamp
correctly recognizes it as a DTS stream).

I used Cool Edit to first generate a track
that sweeps the frequency from 300Hz
down to 20Hz in one minute, and burned
that to a CD. I then used a microphone to
record the room response (again using Cool
Edit) at the listening position, as I played
back my sweep track. I found various
suck-outs in the response plot — not a big
deal, these being quite narrow and next to
impossible to overcome — and three signif-
ificant resonances that correlated very well to the resonances predicted by a spreadsheet
I downloaded from
www.ultimatemag.com/news/

10388. Next, I downloaded a free paramet-
ric EQ plugin for WinAmp from
www.winamp.com, and configured it with
deep (-90dB) and narrow (5Hz wide)
notches at the three main problem frequ-
encies (46Hz, 57Hz, 115Hz).

The result: bass that initially sounded
less "powerful" but, in a more important
sense, more musical, fast, and downright
pleasant. Most of my music listening these
days is via PC, so I intend to use this para-
metric EQ arrangement indefinitely. I
wouldn't be more pleased with the
improvement. Agius Perulli

HE 2004 West canceled

Editor:
As a resident of Mountain View, California
(35 miles south of San Francisco), I had
been following the hotel strike. I decided
to not to cross the picket line to attend Home
Entertainment 2/04 West in San Francisco
because, in my opinion, the hotel owners and
managers were dealing in bad faith.
Oh, well — maybe next year! Paul J. Stiles

Dismayed

Editor:
I was very dismayed at the sudden cancel-
lion of the San Francisco show. I have
spoken to various stereo retailers who had
made plans reservations, already sent their
equipment to San Francisco, and sched-
uled the first week of November around
the Show. I hope you realize that you have
done a real disservice to the audiophile
community. The cancellation is a real
cheap shot on Stereophile's part. Richard
Castillo

It was with a heavy heart that our management
decided to cancel HE2004W, Mt. Castillo. But
when the hotel owners turned down the mayor of
San Francisco's suggestion for a cooling-off period
one week before the Show was scheduled to start,
the Show's fate was sealed. Adam Mandler, presi-
dent of Primedia's Home Technology and Photogra-
phy Group, sponsors of the event, said, "The
disruption of services would affect our exhibitors
and show attendees and we had no choice but to
cancel the event." From it being a "cheap shot,"
canceling the Show was by far the more expensive
option. Even so, we felt that proceeding with a
damaged, smaller Show would have let down the
industry to a greater extent than would canceling it.
Advance ticket holders are having their refunds
credited with the ticket cost. We processed these orders
in the order in which they were received, all refunds
should have been issued by November 30, 2004.

The next Home Entertainment Show is sched-
uled for April 28 through May 1, 2005, in New
York City.

-JA
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INDUSTRY UPDATE

US: CUPERTINO

Barry Willis

The iPod is being very good to Apple Computer, which sold 860,000 iPods in its third fiscal quarter, ended June 30, 2004—more than twice the 336,000 it sold in the same period in 2003. During the same 2004 quarter, iPods outsold Mac computers by 24,000 units, helped by improved supplies of the new iPod Mini for the US market and by the introduction of the player to the global market. Approximately 6% of iPods sold were branded by Hewlett-Packard. Counting business done by Apple's iTunes Music Store, music products now account for 27% of Apple's revenues, almost five times last year's level. By comparison, revenues for Mac computers grew only 2.6% over the past year.

Apple so dominates the digital music market that "iPod" and "iTunes" are almost generic names for portable players and downloadable music. The company owns 61% of the market share in portable music players, according to statistics cited by research firm NPD Group, Inc. Upscale hotels are even providing iPods pre-loaded with thousands of songs for their guests to use, according to a November 4 report by CNET News writer Alorie Gilbert. One such hotel, Manhattan's Dream, provides the players and cables to connect to Bose speakers in each of the hotel's 200 rooms, which also have 37" plasma televisions. Several audio-industry pundits, including our own Jon Iverson, predict that the hottest product niche in the coming year will be preloaded portable music players.

Apple's success isn't without a downside, however. The company is being sued by several resellers who have charged that Apple gives preferential pricing and support to its own stores. According to reports from London, it could also be facing a $35.65 million settlement with Apple Corps, the Beatles' record label, in a dispute launched in July 2003 over use of the name with regard to music products. Reportedly named for cofounder Steve Jobs' favorite musical group, Apple Computer has twice settled with Apple Corps over use of the name, first in 1981 and again in 1991. In those cases, settled for $80,000 and $26.5 million, respectively, the two companies defined the arenas where the "Apple" moniker could be applied: the music industry for the record label, the computer industry for the computer company.

The current dispute has been delayed while Apple engaged new legal representation. Apple's new law firm is Freshfields Bruckhaus Deringer, according to a report in Mac World. A separate report speculates that Apple could be exonerated from charges relating to violating its trademark agreement with Apple Corps, because the 1991 agreement defined music products as physical commodities such as CDs, not as digital files.

Meanwhile, Jobs is dickering with the city of Woodside, California, over the fate of his 17,000-sq-ft home. Jobs is seeking to demolish the 1920 building over the objections of local preservationists, who claim it has historical value as an excellent example of Mission Revival architecture, according to the Palo Alto Daily News. We all should have such problems.

US: WASHINGTON, DC

Jon Iverson

According to 11th Annual Holiday Sales and Forecast, a report from the Consumer Electronics Association (CEA), the bright spot for the audio market is likely to be media servers. The CEA's research finds that 53% of consumers are interested in having the ability to store music on a PC and listen to it anywhere in the house. The CEA says that 38% of consumers currently own a media server—either a desktop or personal computer acting as a server or a dedicated media server.

CEA Market Research defines media servers as devices that store all of a consumer's digital content (music files, home video, digital images) in one location, allowing it to be viewed or listened to from multiple locations in the house.

The survey also found that close to 19% of consumers indicated they plan to purchase a media server in the next two years. Of those, 49% noted they would be somewhat more likely to purchase a server if it could be installed, set up, and maintained by a professional.

A CEA spokesperson commented,
“The market potential for media servers is real, even as manufacturers seek to define this emerging category and educate consumers about its potential. Our survey shows that among the most compelling features for consumers is the ability to store music on a PC and listen to it anywhere in the house—53% agreed or strongly agreed with that statement.” On the other hand, as you can read in this issue’s “As We See It,” the prerecorded media industry is moving further and further away from the notion that their copyrighted material can be stored on media servers.

**US: YOUR LOCAL MEDIA OUTLET**

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**INDUSTRY UPDATE**

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**Focal–JMLab.** Daniel will discuss and demonstrate the unique technology and artistry of the Utopia speaker series. For more info and to RSVP, call (217) 356-5456.

**MINNESOTA**

- Tuesday, January 18, 7pm: The Audio Society of Minnesota presents Stereophile reviewer, Paul Bolin. For more info, visit www.visi.com/~asm or www.audiomn.org.

**TEXAS**

- Friday, January 21, 7–10pm: Sound Mind Audio (Austin) will host its first open house of 2005. Hear the latest components from WCES 2005 and talk with manufacturer reps. There will be refreshments, giveaways, and lots of music, theater, and fun. Limited to the first 40 reservations. RSVP (512) 377-2834, or e-mail bk4music@soundmindaudio.com, RE: Open House.

**WISCONSIN**

- Saturday, January 22, 1pm: Robert Schult, owner/designer of Ridge Street Audio, will be demonstrating his RSA cables and his new speaker to the Northeast Wisconsin Audiophile Society. The gathering is open to the public. For more info, visit www.newaudiosociety.com or call Nate Kern at (920) 405-9936.

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**Good news though this is for the industry, 2004’s first-half shipments still lagged behind 2001’s by 4.3%. The upturn came in the wake of stepped-up prosecution of large-scale file sharers and professional pirates. Shipments of recordings in all formats were up 8.5%—a catch-all category that includes 2.1 million cassettes, 600,000 vinyl LPs, 1.9 million vinyl singles, 500,000 music videos, and 11.2 million DVD videos. The RIAA report noted sales of 58.6 million “digital singles” (downloads) but attached no monetary value to these, nor did it add them into the first-half cumulative total.

Hi-rez audio is alive but gasping for breath: Shipments of Super Audio CDs and DVD-Audio discs reached approximately 600,000 units, split almost equally between the two formats. The two ‘high-resolution formats’ combined total is a statistically insignificant slice of the 289.8 million units shipped in all formats, but is incontrovertible evidence that many music lovers care about quality sound. SACD appears to be losing ground to DVD-A. The 300,000 SACDs shipped in the opening months of this year were fewer than half the 689,000 that went out in the first six months of 2003, while the 300,000 DVD-As shipped were three times the 100,000 shipped in that period. It is probable that hybrid SACDs such as the Rolling Stones and Bob Dylan releases, which tend to be racked in stores with regular CDs, were not included in the RIAA’s SACD figures.—Ed.

Sales of music videos rose by 8.7%, according to the RIAA, whose chart shows simply rough figures of “0.5” million units sold in the first halves of 2004 and 2003. That gain was nothing compared to the doubling of sales for DVD videos, which went from 3.6 million in the first six months of 2003 to 11.2 million in the same period this year. The RIAA chart and accompanying report don’t define the difference between “music videos” and “DVD Videos.” We can only guess that the latter category includes full-length concerts.

Vinyl LPs and EPs declined by 8.5% but still managed to match SACD’s and DVD-A’s combined 600,000 units. The dance-club DJ favorite, vinyl singles, shipped 1.9 million units in the first six months of 2004, a modest gain of 1.9% over the previous year. CD singles and cassettes continued to lose popularity, with 55.6% and 68.2% declines, respectively. Even so, the 2.1 million prerecorded cassettes that went to retailers were just under 1% of all recordings shipped—almost twice the 1.2 million combined total of vinyl LPs, SACDs, and DVD-A discs. The audiophile mission remains unaccomplished.

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**UNITED KINGDOM**

**Paul Messenger**

The continued success of a magazine such as Stereophile might puzzle the music and magazine executives who worship at the altar of youth culture (aka yoof kulchur), but it’s really just a function of the shifting demographics of our rapidly changing society. Addressing the Annual General Meeting of the British Phonographic Industry (BPI) AGM, David Hepworth, UK media entrepreneur and owner of music-oriented magazine Word, used the phrase “50-quid bloke” to describe an increasingly important customer who had been widely ignored by the music business.

The word *quid* is British slang for the...
"Halcro’s dm58: The Best Amplifier Ever!"
Stereophile Magazine, October 2002

Absolute power corrupts absolutely.

After you have experienced 16 channels of bridged Halcro amplification and the most advanced home theater processor on the world market - the new Halcro Logic SSP100 Surround Sound Processor - at the annual DTS home theater presentation, all your comfortable preconceptions about what you thought was great home theater will be shattered forever. Can you live with that?

Be sure to visit the DTS demonstration room at the Las Vegas Convention Center, Room N242 during the CES to experience sound & vision at its absolute best.

Halcro will also be showing their Halcro reference range and new Halcro Logic home theater range at the Alexis Park in Suite 2701 from January 6th to the 9th.

Super Fidelity impact with super low distortion. Super Definition Sound & Vision.

Listen for yourself. And see for yourself.
Pound Sterling; the phrase is easily translated into US English as $100 guy. As I read more about this newly identified socioeconomic stereotype, I began to recognize some of my own patterns of behavior, and suspect the phrase might well apply to a good chunk of Stereophile’s readership.

The bottom line, here in Britain and for the first time, is that fortysomethings are buying more CDs and LPs than are teenagers. The BPI’s figures showed that 12-19-year-olds’ purchases of CDs and LPs fell from 22.1% of the market in 2000 to 16.4% in 2002, while in the same period the proportion bought by 40-49-year-olds increased from 16.5% to 19.1%. Likewise, the 50-59-year-old share was up more than 4%, to 14.3%. If current trends continue, “over-40s” will soon account for more than half of all CD and LP sales. Comparable trends are seen in music magazines; those aimed at older readers look much healthier than youth- and chart-oriented titles.

Hepworth described his 50-quid bloke as “The guy seen in Borders or HMV on a Friday afternoon, possibly after a drink or two, tie slightly undone, buying two CDs, a DVD, and maybe a book–50 quid worth–and frantically computing how he’s going to convince his partner that this is a really, really worthwhile investment.” Although he may well be a big Web user, the 50-quid bloke also has a collector’s mentality. Unlike his children, he actually wants to own things. He wants to keep up with new trends and bands, yet he also likes groups such as the White Stripes, Coldplay, Blur, and Franz Ferdinand, because of their traditional, familiar sound.

He’s been in love with music all his life, and “has the High Fidelity chip embedded in his brain,” according to Word’s Jerry Perkins. He is university-educated, reads a “quality” newspaper, and watches The Simpsons and The Office, but not much else on TV. He may indeed be a she, but, according to Hepworth: “blokes get the same giddy rush from buying CDs and DVDs that most women get from shoes. It’s a spiritual thing.”

A spokesman for UK music retailer HMV commented that the BPI statistics merely confirm what they already knew. “These people are babyboomers for whom music has always been a central passion, and they have the disposable income. A long time ago we stopped defining our target audience by age, because it’s more about how much music means to them.”

Once upon a time, the generation gap was all about musical content. Now it seems to have shifted to cover the different ways in which music is perceived and consumed. Whereas under-30s are happy to share, swap, and download, legally or not, over-40s prefer to build up permanent collections. Having bought their favorite music first on vinyl, then again on CD, they’re now helping boost the sales of classic rock DVDs. In the final analysis, the 50-quid bloke could be the savior of a battered and embattled music biz that’s struggling to address its traditional youth constituency.

US: SAN FRANCISCO
Barry Willis, Jon Iverson, & John Atkinson

The 117th Audio Engineering Society convention, held October 28-30 at the Moscone Center in San Francisco.
hear a dismaying amount of bad sound on the Audio Engineering Society (AES) convention floor. Tizzy high frequencies and mushy bass are more common than not, but encouragingly, good-sounding products tend to draw small crowds or generate a buzz among attendees. Some of the potentially good sound at AES can’t be heard at all—exhibitors feel it’s pointless to demonstrate in a crowded, noisy convention hall. Therefore, the verifying experience must be postponed to a later date, perhaps in a visit to a manufacturer or studio.

One display that consistently did good box office in the Moscone Center was Bryston’s full music/home-cinema surround system, complete with a 42” plasma screen and seating for six. Several years ago Bryston teamed up with British loudspeaker company PMC to create good-sounding powered loudspeakers. In San Francisco, the system fulfilled its mission, with audio sophisticates standing three deep to experience a concert video of former Pink Floydian David Gilmour. In our two days of wandering the convention floor, his performance of “Comfortably Numb” was the only thing that provoked spontaneous applause.

It’s nonetheless encouraging to see the audiophile approach making headway in the pro market. One manufacturer that has made an apparently complete aesthetic turnaround is KRK Systems (a division of the Stanton Group), now run by Revel’s former head of engineering, Domenic Buonincontri. KRK monitors have long been studio standards, despite their deserved reputation for high frequencies so intense and beamy “they could drill holes in your head,” as one mastering engineer described them. KRK was one of the targets of former Threshold Audio president Chris English and Georgetown Masters engineer Denny Purcell, who had teamed up with the vision of bringing better sound to the studio world, a mission cut short by Purcell’s sudden death two years ago.

That mission may now have been accomplished from within. Buonincontri brought his entire audiophile agenda with him from Revel, completely overhauling the design of all KRK products and introducing several new lines. KRK’s new V Series powered monitors, for example, feature high-excursion Kevlar woofers, soft-dome tweeters, and high-quality electronics. The company’s V12 S, a 250W powered subwoofer, features a foot-pedal cutoff switch that lets engineers instantly shift from full-range playback to full-range with low-end reinforcement. The company’s entry-level products, such as its RP series, are made in China, but higher-end KRK products are made Stateside, according to Buonincontri.

Another loudspeaker brand generating buzz at AES was newcomer Lipinski Sound Corporation, whose designs riff on the D’Appolito array popular in many audiophile products. Founder Andrew Lipinski followed a common trajectory in deciding to create his own line of products—he had been consistently dissatisfied with products from other companies, at first modifying them and later coming to the conclusion that it would be best to simply build them from the ground up. Composer Robert Rich, Stereophile webmaster Jon Iverson’s musical colleague, was one of several folks I bumped into on the AES floor who...
gave the Lipinski monitors a big thumbs-up—as did John Atkinson, who auditioned a pair of Lipinskis in Ray Kimber’s listening room last August.

Perhaps the most interesting AES news for the audiophile was the formalization of a new high-resolution standard, DXD, for “Digital eXtreme Definition.” Developed by Merging Technologies as the internal format for the processing of DSD signals in its Pyramix digital audio workstation, DXD is basically 24-bit linear PCM encoding running at a sample rate of 358kHz. Digital processing of the raw DSD signal is next to impossible, so for equalization and level changing, the data must be converted to some kind of PCM, then converted back to DSD. Why not keep the signal in the DXD format, thought Merging Technologies, and do the final conversion back to DSD at the very end of the process, when nothing more needs to be done? DXD is being supported by high-end English audio-converter company dCS.

At a well-attended workshop, “From Stereo to Surround,” chaired by recording engineer Nathaniel Kunkel, the panelists spent time discussing public acceptance of surround formats, noting that the surround records that sell in quantity are the same as the stereo records that sell well. Engineer George Massenburg commented that SACD sales simply had not happened, while Warner’s Robin Hurley predicted that surround-sound downloads are just around the corner.

Another of Hurley’s brief comments may have particular significance for high-resolution audio supporters: “Standalone DVD-Audio discs will disappear.” He predicted that DualDisc will succeed where DVD-A failed by appearing in the regular bins along with regular CDs, not in a special section of the store. Hurley cited an example to suggest that DualDiscs can also easily outsell CD/DVD packages. According to his numbers, the recent Simple Plan release as a single $1.99 DualDisc title is outselling by two to one the same content in an $18.99 double CD/DVD package. Hurley added that the Talking Heads catalog will soon appear as DualDisc titles.

Hurley acknowledged that having two high-resolution/surround formats was a problem, but he felt that the formats will eventually sort themselves out. He did not say whether or not he thinks that the DVD-Audio format or high-resolution audio will always be part of DualDisc.

Milan’s TOP Audio hosted the first public showing of the Nagra PMA Pyramid monoblock amplifiers: 200W each, a frequency response of 10Hz-70kHz, 104dB signal/noise ratio, and a footprint of 14.9” square. It features auto-detect power-on as well as auto-switch-off if no signal is received for 20 minutes.
ITALY: MILAN
Ken Kessler
Milan's TOP Audio remains Europe's most stylish hi-fi show. The event is the most user-friendly—each room's sign tells you whether the display within is stereo, multichannel, or both, as well as the exhibitor's nationality—purists don't have to waste any time. TOP also balances purist analog, two-channel digital, new formats, vinyl, display technology, multichannel, and even a bit of in-car sound in a way that pleases just about everyone. It's a show for everybody, from families with kids (video, computer games) to die-hard, militant, stereo/analog tube fanatics. I love it to pieces. Choosing favorites is difficult, but there were some standouts that I would love to get my hands on, even if only for a short while.

I'm no solid-state fanatic, but Nagra's PMA Pyramid monoblock power amplifiers looked terrific and sounded sensational. Each of them puts out 200W and simply oozes Swiss build quality. What am I talking about? It's Nagra, for goodness' sake!

In the same room was the very cool S.A.P. VF Autograph zero-feedback direct-drive turntable, with five-phase stepper motor, special 12" SME 312 tonearm, and a modified EMT cartridge. The base is a 60mm-thick slab of marine-grade mahogany plywood, and the platter is made of 12mm-thick aluminum and fitted with 12 steel weights on its underside. S.A.P. also supplies a 1kg stainless-steel record clamp. You can also buy the VF Autograph without arm or cartridge, and S.A.P. makes an all-tube phono amp as well. By the way, I saw EMT cartridges all over the place—this classic is back in production. Will their legendary turntable follow?

Absoluta takes the Italian passion for wood to new heights in a sublime range of all-tube electronics: Calliope stereo preamp, Ermes phono amp, and Orpheus and Apollo output-transformerless mono power amps (80W and 55W, respectively). But they're no fools: Those who don't worship wood can order these models in all-aluminum enclosures, or in aluminum with leather.

Another tube range that caught my eye was that of Paso/Geloso. They showed a decidedly vintage-looking pre-power combination, the PG232HF preamp and AG232HF monoblocks, in funky gray paint with 1950s-style knobs and a neat round meter on the power amps. But hey, this is Italy—nobody does retro better.
US: DENVER
Peter Breuninger

The Rocky Mountain Audio Fest is the first audio show to bridge the gap between hobbyist get-togethers and large-scale national shows. Held October 8-10, 2004, it had the intimacy of a single-venue site as well as all the bells and whistles we’ve come to expect from a hi-fi show. There were more than 60 manufacturer and dealer demonstration rooms, a vendor sales area for LPs, CDs, tubes, and accessories, education seminars ranging from system setup to a “meet the experts” roundtable, and live music, including a show-stopping performance by jazz great Patricia Barber.

Show organizer Ron Welborne came up with a simple concept of how to showcase sound, music, and cutting-edge equipment not only to audiophiles, but to the general public. A short meeting between Colorado Audio Society founder Art Tesdeshi and Welborne started the ball rolling. They teamed with Al Stiefel, a retired business executive, to implement the show plan. Support from several area manufacturers (Boulder, Avalon, and the Jeff Rowland Design Group) gave it momentum. Then the simple concept of show promotion via FM radio spots snowballed with the idea to broadcast Patricia Barbara live in 5.1-channel surround sound. What an idea—promote high-end audio to music lovers!

The show was chock full of stories. They began the first night, at the cocktail reception. Jazz singer Ellyn Rucker opened, fronting a band that was tight in the groove and delivering sultry and saucy classic renditions. The group’s producer, Tom Burns, told a tale of his Capri recording label and how he had made the ultimate faux pas: He took a pass on producing a tall, young, vibrant blond singer. She’s now married to Elvis Costello.

At the registration desk, jazz station KUVO, 89.3 FM, was broadcasting live. Mike Pappas, the station’s engineer, was beaming with pride about their HD radio broadcasts and 5.1-channel encoding. Mike said that all you need is a little box to decode the signal, and presto—5.1 from your FM tuner.

Exhibitors ranged from startup speaker manufacturer SP Technology, to well-known high-end companies such as McIntosh, Rogue Audio, and Cardas, to imported lines such as Linn and Croft, to established Denver retailers Listen-up and Audio Unlimited. The show’s affordable exhibit rates gave small companies first-time opportunities to demonstrate their wares to consumers, press, and dealers. As SP Technology’s founder, Robert Smith, said, “This show’s a godsend for guys like us.”

The sound ranged from the magnificent on down. My vote for best sound went to the Art Audio room. Joe Fratus, Art Audio’s founder, had a Metronome tube CD player and Carissa 845 amp driving a pair of brand-new Cabasse Bahia three-way loudspeakers. I could have reached out and touched the sound—Star Trek Holodeck stuff. The results were all the more impressive considering that the speakers hadn’t been broken-in and that this simple system cost less than a Honda Civic. Less was more.

The “audio marketplace” room was anchored by Classic Records. Mike Hobson, Classic’s proprietor, was helping show attendees find their favorite recordings—well done, Mike. Cool stuff from the Jeff Rowland Design Group caught my eye, such as a 500W amp not much bigger than my laptop. Rowland licenses Bang & Olufsen’s ICE Power, a black-box switching power-supply technology, which does the “Honey, I shrunk the amp” thing. Josh Stippich was showing off his Electron Luv amps and preamps, which bordered on the bizarre—cappuccino machine meets 1952 Buick. Photos do not do these things justice. The Luv gizmos were wired up to Terry Cain’s Studio BEN ES (Big Enough) 99dB-sensitive, horn-loaded art deco speakers.

My runner-up for best sound was the impressive new Prometheus speaker from Germany; a super-efficient, open-baffle, naked-driver gem of a speaker that breaks many rules. Designed by Robert Bastani and distributed by Bill Allen of Batusi Audio, the Prometheus was free of honk, sounded big and dimensional, and can be used with amps from 3W to 100W. It’s being introduced in kit form for under $2000/pair, including subwoofer and sub amp. The Audio Fest was ideal for new products such as this, and for companies with limited marketing budgets.

UNITED KINGDOM
Paul Messenger

The mid-1990s was not a good time to
Challenging the limits of digital reproduction!

musicdirect is very proud to offer you the entire line of Esoteric digital products. No other manufacturer has the resources to design and build products of this caliber. The sophistication of Esoteric's manufacturing process is second to none.

The Esoteric DV-50S plays any disc with a level of sophistication and realism previously unattainable at any price. Stereophile created a special "Class A+" category for players of this caliber. That's how great it sounds. Whether you just play standard CD's on this revolutionary product or take advantage of theDV-50's breathtaking presentation of high-resolution SA00, DVD-A and DVD-Video discs, the DV-50S will forever change your feelings about digital audio.

First Look!

The new Esoteric X-01 and UX-1 are absolutely the world's finest digital players. The X-01 is an audio-only player, while the UX-1 is a universal player. Based around Esoteric's proprietary VRDS-NEO transport mechanism, acoustic and visual design elements are fused into components of unequalled precision. Whether your passion is bvc-channel audio, multi-channel audio, or a complete home theater experience with dazzling video reproduction, Esoteric products are truly in a class by themselves.

For those who demand the very best!

Shunyata Research
HYDRA Series Power Conditioners

Shunyata's award winning power conditioners have taken the audio community by storm! The Hydra line now consists of 4 models: The Hydra 3, Hydra 6, Hydra 4 and Hydra 2. Starting at only $399, these passive conditioners make an immediate impression on any listener in any system. Recommended by many high-end component manufacturers, professional studios and world-renowned recording engineers; the improvements brought about by the Shunyata Hydra Series are at all audible. Please call us to discuss the Hydra's technology and help you find the right one for your needs. Try one (or more) in your system and hear for yourself.

The Shunyata Hydra's and Accessories are the real deal...Adding them to an already high performance system may well prove to be a more cost effective sonic upgrade than replacing components.

- Paul Bolin, Stereophile August 2004

Musical Fidelity X-10v3 Tube Buffer Stage $399.

Musical Fidelity X-10v3 Tube Buffer

A legend returns! Musical Fidelity sold almost 50,000 of their X-Can Tube Buffer Stage and has finally brought it back to life. The new X-10v3 is based on Musical Fidelity's exclusive Mu-Vista (kW) tubes and is guaranteed to add the magic of tubes to any system without adding any significant noise or distortion. Perfect behind any digital player, in a tape monitor loop or between your preamp and amp. The Musical Fidelity X-10v3 Tube Buffer Stage is limited to less than 5000 units so audition one in your system before they are history!

The $1595 Marantz DV-8400 is the best sounding Universal SACD/DVD-A/CD player priced under $2000! "As much as I like the Linn Unidisk 1.1 ($11,000), I think I like the much less expensive Marantz even more..." - Kalman Rubinson, Stereophile

The SA-8260 is a Stereophile Class A Rated dedicated SACD/CD player for under $1000! "Recommending the SA 8260 is a no-brainer!" - John Marks, Stereophile

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It's the Music that Matters!
We couldn't call ourselves musicdirect if we didn't carry the most diverse selection of the world's finest recordings! We also stock every single title reviewed in here in Stereophile. Call us or check our website for our recommendations.

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It's really nice.
be making turntables. Some companies had already given up; others dug in, continuing to make existing models but investing little in the future. The prospects of embattled vinyl looked a lot gloomier than they do today. That a company named Avid (www.avidhifi.co.uk) began making turntables in 1995 and now sells its products in more than 20 countries is powerful evidence that it must be doing something right.

The thing about turntables—indeed, about virtually all transducer-related components—is that any given design invariably consists of a complex series of interrelated compromises. Furthermore, there’s no clear consensus about the right way to make these compromises work—one has only to observe the considerable variety of mat and platter materials chosen by different firms. Each designer therefore has a wide range of choices within which to create a unique engineering recipe.

When I spoke with Avid’s principal, Conrad Mas, it was clear that he has his own ideas about how a turntable should operate. As he described the ins and outs of his top model, the Acutus, his ideas seemed persuasive and well-thought-through, with an interesting and consistent approach to “energy management.”

Crucially, when a stylus tracks a disc, significant vibrations are generated within the disc itself; how best to deal with these has long been an area of debate and controversy. Avid uses quite elaborate techniques to, as much as possible, remove these parasitic vibrations while maintaining the rigidity of the platter-subchassis-tonearm loop.

The Acutus’ mat of bonded polymer is designed to reflect angular-incident energy but absorb the vertical energy. The LP is clamped directly to the main bearing, the assumption being that the latter acts as a mechanical diode, absorbing vibrational energy and leading it down into the turntable’s substantial metal subchassis. Vibrations also feed into the tonearm and hence, via its bearings, to the same subchassis. Rather than unipivots, Avid recommends tonearms with separate vertical and horizontal bearings to aid this energy transfer.

The main turntable bearing—a tungsten-carbide ball in a sapphire cup—is inverted, partly to place it as close to the LP as possible, and partly for the stability of positioning it above the platter’s center of gravity. Made from a 16mm shaft of hardened stainless steel, the main pillar is tapered to avoid standing waves and to promote the diode effect. The cast subchassis is shaped for extra strength between the main bearing and arm support. Less rigid flats are designed to dissipate energy at the three suspension pillars; the grain structure of the metal and the finish paint are chosen for the same reason. Three sprung support pillars not only give decoupling above a low 2Hz, but, unusually, are adjustable for frequency as well as height; all three can be balanced, despite the asymmetric mass of the floating turntable/tonearm. The Acutus’ high-power synchronous motor, rebuilt by Avid, gets its juice from a generous split-phase, quartz-locked power supply. The motor drives the massive, 22-lb platter via a round-section belt; speed stability should be impeccable under all conditions.

I haven’t yet tried an Avid Acutus so I can’t report on performance, but I can state that the standards of finish and engineering look exceptionally high. Although Avid itself is still quite small, the company operates in partnership with Cambridge Precision, a substantial specialist engineering operation that does prestige specialist work for the automobile and car racing industries. With such resources behind it, and alliances with high-quality distributors in major markets, Avid could well make up for its late start and grow into a significant player on the vinyl replay scene.

EUROPE
Barry Willis

The merger of Sony Music and Bertelsmann Music Group (BMG), covered at length in these pages, may not be a done deal after all. On Wednesday, November 4, a trade association representing approximately 2000 small European record labels announced that it would appeal the merger approval granted in July by European Union (EU) commissioners. Impala, as the trade association is known, contends that the merger concentrates too much power and market control in too few hands. Impala will make its case before the EU’s high court. Should its petition succeed, EU regulators would have to reverse an unconditional approval and order the partners to separate their joint operation.

“The threat of a duopoly operating in the business without any real constraints is too great for any serious company or sector to ignore,” said Impala vice president Alison Wenham, who is also the CEO of the Association of Independent Music, a British “indie” alliance that represents 800 companies.

Consolidation has gone too far in the music industry. Impala charged, noting that 80% of the global market for recorded music is controlled by four giants: EMI Group PLC, Sony-BMG, Vivendi Universal SA, and Warner Music Group (WMG). Such control favors superstar artists while minimizing exposure for those who are less well known, according to indie spokesmen.

Impala’s official challenge to the merger could be heard as soon as mid-year 2005, but the litigation process could drag out over more than two years, according to the Associated Press.

CANADA
Jon Iverson

Pierre Gabriel Acoustic (www.pierre Gabriel.com) recently announced that it has acquired exclusive distribution rights to Jadis Electronics in the US. Jadis is based in Villebon, France, where it manufactures tube-based audio electronics.

Based in Quebec, Canada, Pierre Gabriel Acoustic was established in 1990 and has distributed both Jadis and Gryphon in Canada for several years. The company also manufactures and distributes its own line of high-end loudspeakers and silver-wire interconnects.

THE INTERNET
John Atkinson

First there was the magazine, then there was the Show, then there were the CDs and LPs, then there was the website (seven years old almost to the day as you read these words), and now there is Stereophile’s monthly electronic newsletter. Delivered straight to your email inbox, our free newsletter will have hot high-end news from veteran audio writers Wes Phillips and Ken Kessler.

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SLP-98 as shown includes the phono section along with chassis in Jaguar® Anthracite black clear coat and silver anodized front and knobs.
think I got it right this time,” Renaud de Vergnette said, conveying his remark by way of Alain Chlous, international marketing manager for Triangle Electroacoustique. Renaud was referring to his Es line of speakers, which includes the celebrated Celius, a model for which Triangle received a rating in this rag’s “Recommended Components” of “Class A: Restricted Extreme LF” (April 2004). More on that anon.

Word of the new Celius Es has been getting around. Mychum, Vadim Yarmolinet, of Novoye Russkoye Slovo (New Russian Word), New York’s daily Russian newspaper, owns a pair of Celiiuses. “Hey, Samchik,” he phoned to ask. “Should I sell my pair of Celiiuses?”

“Mozhet byeet, Dimachka.” Maybe.

Dima writes about high-end hi-fi for Stereo Review. “Should I sell my pair of Celiiuses?”

Dima writes about high-end hi-fi for Stereo Review. “Mozhet byeet, Dimachka.” Maybe.

Renaud brought the Magellan’s technology à la terre (to earth) with his Stratos loudspeaker, which I reviewed in the June 2003 Stereophile (Vol.26 No.6). As Renaud explained three years ago, before he sent me the Magellan for review, he was making them almost without regard to cost—or demand, for that matter. If demand materialized, great. Meanwhile, the speaker would solidify Triangle’s reputation as a premier speaker manufacturer far beyond the borders of France.

Renaud would see what Triangle could do without cost constraints. Then he and his enslaved engineers (I’m joking) could take what they learned and trickle down the tech. Turns out the $35,900/pair Magellan has been a commercial success and given rise to a line of luxury speakers. Moi? I’d spend the dough on travel, food, wine, and concert tickets.

“That’s because you’re really French or Italian,” my Russian wife, Marina, suggested while reading this column over my shoulder.

Renaud brought the Magellan’s technology à la terre (to earth) with his Stratos range of loudspeakers. The prices are high, though not stratospheric. Now he’s adapted much of the technology for the Esprit line—peu de centimes instead of beaucoup defrancs. (The old French money was more fun.) Now melomanes of modest means can enjoy much of the Magellan magic.

Melomanes. Music lovers. Don’t you love that word? Russian has it, borrowed from the French. English has it, too, though it’s seldom used. More melomanes, fewer audiophiles. That’s the ticket.

Triangle produces still less expensive lines, primarily for the frugal French, and sells through several hundred domestic dealers. Triangle is a huge presence in France. Their modern factory is located in an industrial park just outside otherwise dismal Soissons, in northern France, not far from the Champagne region, which is actually quite cheerful. It’s customary in Soissons to serve a bottle of champagne and a bottle of wine when
The local Soissons hi-fi dealer, Patrice Luc, of L’Auditorium Patrice Luc, often offers champagne when customers arrive for a listening session. This is one of the finest hi-fi salons in France or anywhere else, and it’s located a stone’s throw from the Triangle factory. Customers travel from Paris and environs. Curiously, there is no great high-end hi-fi shop in Paris, while there are legions in London—well, quite a few. If you want the location of one of France’s greatest hi-fi salons, voilà: Soissons.

“You have no idea of what Renaud put us through with this new series,” Triangle’s Alain Chlous confided. “Il faut travailler comme un diable.” It is necessary to work like a devil. “But it was worth it, no?”


I can imagine the grief Renaud gave his team of engineering slaves. Mind you, there’s nothing tyrannical about Renaud—he does not strut like le roi, despite having grown up in Versailles. He’s full of life and good humor—fond of American cartoons, he loves to play tricks. His wife, Thérèse, describes him, accurately, as a big child. But he’s also a perfectionist who knows the sound he wants and who knows when he gets it—rather like Antony Michaelson, of Musical Fidelity. I read the French hi-fi rags, and Renaud is, peut-être, the most revered figure in French hi-fi.

Renaud was not trained as an engineer, which seems to be a blessing in this business. If you’re an engineer, you’ll probably design by the measurements. If it measures perfectly, it is perfect. How many hi-fi firms have pursued such perfection until they went out of business? How many magazines, for that matter?

Early in his career, Renaud sold curtains and window treatments at the Galeries Lafayette department store, in Paris, which is where he met Thérèse. Renaud says she saved his job. He admits he was none too adept with curtains and window blinds.

At the time, he may not have been so hot with hi-fi, either. According to Thérèse, when they were dating, Renaud built her an amplifier from a kit. “It didn’t work,” she laughed.

Renaud likes clean, crisp, clear sound—fast. In French, la vitesse means speed. The word is related to la vie (life). Life. Speed. Dynamics. A flat frequency response is nice, too. Eh, bien? Maybe you can leave that to the engineers. (Renaud did not say that.) If Renaud holds his engineers’ feet to the fire in terms of sound, the engineers may do likewise to Renaud in terms of measurements. The contrast—the contest, if you will—seems to work. All drivers for all models are the products of computer-aided design.

The general take on Triangle was that its speakers might have something of a high-frequency peak. You can’t imagine how French hi-fi scribes tiptoed around this, using such words as coquetterie (coquettishness), or stylisthness (consciousness of one’s appearance). Heh-heh. Talk about diplomacy. Yet the French hi-fi scribes revere Renaud, and rightly so.

Triangle speakers did so many things so right, at such reasonable, sometimes ridiculously low prices, that a listener could forgive quelquefois coqutetie and slide around it with the right choice of ancillary gear, including [gasp] speaker cables.

Each country has its own preferences in music—especially classical music. This is still expressed in performance practices. It’s reflected, too, in some of the very instruments musicians play. Even in today’s increasingly internationalized and homogenized classical music world, a French orchestra generally sounds different from a German ensemble. The French prefer an open, airy sound. In hi-fi, this translates to a preference for light textures, clarity, speed, definition, and detail. Warmth? Unfortunately, too much warmth can lead to a muffled sound—in live music and in reproduced music, too. I’m not talking about just Triangle here. French hi-fi tends to reflect the musical culture—the classical music culture, especially. (Renaud’s own passions are classical and jazz.)

Would you want a world where loudspeakers from all countries sounded more or less the same? Would you like it if all loudspeaker designers held to the same priorities and strove for the same sound? Does it come down to Focal-JMLab vs B&W? At some point, John Atkinson may censor me.

Moï? Pas du tout. In hi-fi, there is no “absolute” sound. The very idea is an absurdity. Is there an “absolute” sound in performance practices, cultures, music itself?

One difference with Triangle’s new Es line, compared to its predecessor range, is that the frequency response seems smoother, more refined, even more delicate, and better dispersed on top. Furthermore, the various drivers appear to blend better, despite the fact that the tweeters and the rest of the drivers are made from disparate materials. The speakers in the Es range are relatively affordable—not as affordable as before le George W. Bush began bashing the dollar (and W. is still at it), but affordable nonetheless.

Triangle speakers are easy to drive, so you can choose quality of amplification over quantity. All seven speakers in the range offer a stated sensitivity of 90–92dB/W/m and a nominal impedance of 8 ohms, not falling below 4 ohms.

Je ris mon mauvais rire. I laugh my evil laugh.

For most of my listening, I used a chain of Musical Fidelity products: an X-Rayv3 CD player as transport into an X-DAv3 D/A converter, then into an X-100 buffer stage, and finally into an X-150 or a Sugden A21a integrated amp. (I’ll review the Sugden fairly soon. It’s hot—it’s heavily biased into class-A. Heh-heh.)

Triangle Celius Es loudspeaker
The old Celius cost $1995/pair. The new Celius Es costs $2699/pair—still a steal, and still probably the lowest-priced loudspeaker in “Class A: Restricted Extreme

SAM'S SPACE

Triangle Titus Es gets a makeover, too. All speakers in the Esprit range use the same horn-loaded tweeter.
True inspiration accepts no compromise.

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the platform? When Richard Kohluss, should you have to figure out how to attach and assemble your Celius or Antal. Why earns his or her money. Ask him to deliver macrovibrations, I presume.

floor, to drain away vibrations — that's port at the bottom of the speaker, to evacuate I don't know what Trapped gas, presumably.

ductor. This is a platform or pedestal, is designed to serve as an ideal mechanical coupling between the speaker and the SPEC, or single-point energy conduit. Here is another feature of the Triangle Speaker's dimensions, without pedestal, are 43.9" high by 79" wide by 13.4" deep. The pedestal adds another 3" or so of height.

The Celius Es employs the same horn-loaded, 1" titanium-dome tweeter that's used in all seven Es speakers. (The circumference of the entire tweeter assembly is 4.2".) The tweeter sports a brass phase plug that French hi-fi scribes call an agite. I didn't know the word either. I had fun with it — it means nuclear warhead. Indeed, a faint air of military menace hovers about it. The tweeter is said to have excellent linearity and directivity, along with broad dispersion. By the way, please don't let any prejudices about "horns" get in the way. Have open ears!

Below the nuclear warhead sits the 5.5" midrange driver, whose cone is made of cellulose pulp, aka doped paper. Renaud has long favored this material for its tonal neutrality and combination of lightness and rigidity. A doped paper cone can best deliver electrostatic-like speed, he once told me. The polymer surround is said to absorb "microvibrations." As opposed to macrovibrations, I presume.

The driver basket features a truncated circular shape in order to fit inside the new slim cabinet. The front baffle of the speaker — of all Triangle Es-series speakers — is gently curved, a handsome touch that also serves to minimize reflections that would rebound from a hard, flat surface.

The two 6.5" bass drivers are also of cellulose pulp and made in-house, as are all Triangle drivers. No bulletproof vests or hunting trousers. These cones' polymer surrounds are smaller than the midrange driver's; otherwise, all three look alike. The voice-coil is wound in two layers, in and around a Kapton support. There is a large port at the bottom of the speaker, to evacuate I don't know what. Trapped gas, perhaps. I get like this writing about Renaud. He is a very naughty boy.

**Meet Bigfoot**

Here is another feature of the Triangle Celius Es adapted from the Magellen: the SPEC, or single-point energy conduit. This is a platform or pedestal, designed to serve as an ideal mechanical coupling between the speaker and the floor, to drain away vibrations — that's macrovibrations, I presume.

Alsos. Here's where your Triangle dealer earns his or her money. Ask him to deliver and assemble your Celius or Antal. Why should you have to figure out how to attach the platform? When Richard Kohluss, the Triangle distributor, attempted to attach it, he did so d'eftte — backward. C'est l'avité. This is thus his first pair. He quickly corrected his mistake.

In France and the rest of Europe, people usually have floors of tile or bare wood. Wall-to-wall carpeting with thick padding is not known. Obviously, Renaud is not so familiar with the Bronx or Northeast Philadelphia. Or Toronto, for that matter.

Chastened, for North America Triangle has supplied the platform, so that the four ancillary feet can be either rested on soft supports or spiked. The main thing is to let Bigfoot do its thing. You need to drive this large, unmistakable, zericous spike into ze ground. Ze wood. Ze cement. Whatever. À la terre. For a bare wood or tile floor, an attractive brass cup is provided. For a floor with a thick carpet and pad, you should skip the receptacle, and spike the four ancillary feet.

Such is my regard for the Celius Es that, in my listening room, I am tempted to thread two Philips-head screws into my wood floor (which is already pockmarked with holes) and spike Bigfoot into the center of each screw head. Again, you should probably work with your dealer on this. Getting it right is important. Bigfoot drains away the vibes — à mort les vibrations (death to vibrations). Exterminer les vibrations. Zentrally, I think Bigfoot is brilliant. You'll meet him again, shortly, on the Boomerang stand.

Ah. Be aware that the stated frequency response (le bande passante) of le Celius nouveau is given as 45Hz–20kHz, ±3dB. Extreme low frequencies are missing from "full-range" Triangle loudspeakers by design: they create too many problems and compromise the sound too much. There are only so many vibrations, micro or macro, that you can evacuate from the cabinet. I'm serious. If you want extreme low frequencies, Renaud suggests you add a subwoofer. Or two. Les boomers (woofers) are okay; subwoofers are best left to themselves.

There are twin binding posts of high quality, and the new crossover — perhaps responsible, in part, for the smoother, more sophisticated high-frequency response — is mounted to the speaker-post assembly. Renaud thinks that biwiring is bullsh*t (my word), and that a single run of speaker cable will nicely suffice. Your best bet for cables with any of these Triangle models might be the very wire they're wired with: a cost-effective version of the Triangle Silver Ghost silver-clad copper. Good enough for inside the speaker, good enough for outside, no? Your Triangle dealer might have other ideas; you might not.

**Alors. J'écoute. Now the listening.**

The Celius Es is such a seamless triumph that it almost seems inappropriate to talk about parts of the frequency range. But I am a shameless hi-fi hack, so here goes.

The treble was magnificently extended, in true Triangle fashion: with no pesky peakiness that my aging ears picked up. The treble was ultrasmooth — delicate and refined, just like the midrange. Just like me. (Marina is reading over my shoulder again.)

The midrange was convincing, with an immediacy and neutrality that I associate most with electrostats. In this respect, the new Celius is not far behind my reference speakers, the Quad ESL-988 'stats. With the Celius Es, I almost felt I was listening to a full-range electrostatic or a single-driver speaker. The integration of the drivers was that good, and the sound was that close to my Quads.

And now the bass. Problematic? Pas du tout. Not at all. The bottom end was tight, tuneful, truthful, and extended. More important, the bass was very fast. Start, stop. No overhang. No muffled sound. No loss of clarity — or of timing, for that matter. Not that I'm a toe-tapper. This is the treble, not for me. Audiophiles may exit; loudspeaker only if you don't take the lows too low. A problem for you, maybe, but not for me. Audiophiles may exit; melomanes are welcome to stay.
"I must create a system or be enslaved by another man's"

—William Blake

The Innersound System combines synergistically designed components that embody our uncompromising approach to sound reproduction. The Innersound Kaya Reference and Kachina electrostatic loudspeakers, featuring Innersound's UltraStat™ flat panel technology, are complimented by the new iPower 330 stereo amplifier & iControl preamplifier. To find out more about how a perfectly matched Innersound system will bring you closer to the music than ever before, please contact us at 720.210.1925 or sales@innersound.net

To schedule a private showing during CES 2005, e-mail us at ces2005@innersound or call 720.210.1925
For floorstanders, the Celius's imaging was excellent. Soloists and their instruments were precisely placed within a soundstage that was spacious in terms of both width and depth. Pinpoint imaging? I felt that the stand-mounted monitors in the Es series performed a little better. As expected. See below.

I'd be happy to stop right here, with the new Celius, and lay out not one franc more, spend not one centime more — oops, it's euros now. I do love the frugality of the French. But...

I was at Carnegie Hall last night. Balcony, first row, cheap seats, great sound, best in the house — and no legroom. The St. Petersburg Philharmonic performed Rachmaninoff's Symphonic Dances. The timbres. The tonality. The demonic rhythmic drive. The impact of the kettledrums. No hi-fi rig could come close to reproducing that — not even something assembled, at insane cost, by my friend Lars, who, if he were less obsessive about hi-fi, might have suffered a coronary arrest at Westchester airport. My late Svensk friend took hi-fi far too seriously.

You might consider bringing the Celius Es speakers a little more forward than usual. Consider their orientation before you finally spike Bigfoot to the ground. I found that I liked the speakers toed-in just a tad — maybe 5°. For more bass, move the speakers back. I found that the drivers continued to integrate superbly, even relatively nearfield — ie, 6' from my listening chair.

Triangle Antal Es loudspeaker
The Triangle Antal Es measures 42.5" high by 7.9" wide by 13.4" deep — again, without pedestal. Let's see... that's 4499 cubic inches for the Antal vs 4647 cubic inches for the Celius. The Antal Es weighs 49.5 lbs vs 51.7 lbs for the Celius. So, the volume of the cabinet is shrunken by just under 3% and the weight is reduced by just over 4%, yet the price is reduced by 25% — the Antal Es goes for $1999/pair. I see this in wines. Take the 2001 Chateau Mouton-Rothschild at $999/pair. You could call the Antal a scaled-down Celius, and you'd be right. The tweeter is the same 1" titanium tweeter with the nuclear warhead found in the rest of the Es range. The midrange driver is slightly smaller — 5.25" in diameter vs 6.5" for the Celius. The twin bass drivers are the same 6.5" babies we met in the Celius. The isolation platform is similar. So is Bigfoot.

Everything I said about the Celius applies to the Antal, which is hardly surprising. If you like your music loud, the Celius will likely play louder without protest — a consequence, in part, of the larger midrange driver. Je ne sais pas.

If you have a small room, you might prefer the intimacy of the Antal. In my listening room, the Antal was like Baby Bear's porridge: just right. In our living room, the Celius might have been the better choice. The North American distributor looks at those 45Hz and 50Hz ratings and worries that some audiophiles might skip both models.

Was it my imagination, or did the larger Antal image a mite better than the larger Celius? Probably my imagination. Have fun at your dealer's, listen, and let's hear what you think.

Triangle Comete Es and Titus Es loudspeakers
Let's take these two stand-mounters together. D'une pierre deux coups. From one stone, two blows. (Merci, Alain, for your help with my feeble French.)

The Comete Es and Titus Es are both designed to sit on the 20"-tall Boomerang stands ($299/pair). The stands look strange, but that's because they're French. After a while, you might grow to like their appearance, as I did. You'd certainly grow to like their sound. These are my favorite 20" speaker stands, and not just for Triangles. If I have a monitor, these are the stands I generally use.

There are two small spikes in back of the stand and one large spike in front. It's the front that takes the brunt of the vibrations — same idea as the isolation platform for the Celius and the Antal. Again, you need to spike the stands real good, especially the Bigfoot. The stand lets you play with the tilt to some degree, after which point said foot falls off. The single center column can be filled with sand or lead shot. I used sand, and that was enough.

You think the English have a monopoly on speaker stands? Pensez encore. When it comes to controlling vibrations, no one does it better than the French. This is true of electronics, too — think of Yves-Bernard André (YBA). It has to do with preserving the French musical culture. Seriously.

You start with the $299 Boomerang stands. The Comete Es will set you back $949/pair, the Titus Es $749/pair.

This is true of electronics, too — think of Yves-Bernard André (YBA). It has to do with preserving the French musical culture. Seriously.

You start with the $299 Boomerang stands. The Comete Es will set you back $949/pair, the Titus Es $749/pair.

These are two-way monitors. Same warhead-equipped 1" tweeter as before. The Comete's bass/midrange driver (cellulose pulp, of course) is 6.5", while the Titus' bass/midrange driver is 5.25". The Comete measures 16.5" high by 7.9" wide by 13.4" deep, the Titus 14.4" high by 7.1" wide by 11.6" deep. Both speakers are called les enceintes de bibliothèque —
not bookshelf, but library speakers. Both speakers are ideally suited for nearfield listening, and should work exceptionally well in small rooms.

I heard more pinpoint imaging than I did with the Celius or the Antal. The Comete Es went lower and played louder (for me) than the Titus Es. The stated frequency ranges are probably right: 55Hz–20kHz for the Comete vs 60Hz–20kHz for the smaller Titus. Did this make a difference? Yes. The Comete produced a bigger, more authoritative sound — with no loss of pinpoint imaging. Though it costs $200 more, my preference would be the Comete — not that I dismiss the Titus. For both speakers, the Boomerang stands are essential. Considering what they do, the stands are not expensive.

The earlier Titus was a favorite of mine for its ability to fly on 3.5W of single-ended-triode flea power. Alas, I don’t think that any of the speakers in the Es range is a candidate for use with a 3.5W amp, though 8–10W of SET power might be an entirely different story. It could be the new drivers, it could be the new crossovers. I don’t know. None of the speakers is a hog in terms of asking heroics from your amp, but you probably need 8–10W or more.

So far, my favorites of Triangle’s Es line are the Antal and the Comete — even though it’s the Celius Es that I continue to place in Class A. I don’t think you could go wrong with any of the Es models, and I strongly urge you to use not my ears but your own. My favorite? The Antal.

When a friend went to listen to the old Antal, his Triangle dealer told him he didn’t stock that particular model. Why not ante up a few hundred more, the dealer suggested, and get a Class A recommended speaker — the Celius? This, of course, is nonsense, and I suspect the dealer simply wanted to make a few dollars more profit. Class A, Class B — who cares? What matters is that you like it.

Anyway, don’t buy a pair of loudspeakers without first hearing what Triangle has to offer at or near the same price range. And, whatever your price range, be sure to audition the Celius AND the Antal. Not that you’ll necessarily buy a Triangle speaker. You might prefer Opera or Harbeth or Spendor, to name three of my favorite loudspeaker lines. My own all-time favorite remains the Quad ESL-988. Meanwhile, I’d be almost as happy with the Celius Es or the Antal Es for about a third the price.

What can I say? Ecoutez!
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Recommended Component — Stereophile Magazine
The prospect of a four-day fall break at a rustic, dog-friendly ski lodge in Vermont had me scrambling for an audio system. My Apple iPod was an obvious choice, but what about an amplifier and speakers? I considered schlepping a vintage Scott tube amp and a pair of ADC 404 loudspeakers I got at a garage sale, but that seemed like too much of a hassle.

Then I remembered the ZVOX Audio 315, which I'd been sent to evaluate for Stereophile Ultimate AV and had been using with a bedroom TV. The 315 is a plain gray box the size of a table radio containing three high-quality, 3.25" powered speakers and an adjustable 5.25" powered subwoofer. It was designed by veteran speaker designer Winslow Burhoe, who broke into the business working for Edgar Vilchur in the 1950s. Burhoe invented the inverted-dome tweeter, founded loudspeaker company EPI, and designed speakers for Energy, Boston Acoustics, Genesis, and others.

I was glad I thought of it. The 315 is an audiophile-quality mini-audio system. Its synthesized surround-sound feature works really well if you're sitting directly in front of it, but I wasn't interested in that, and listened from bed with that feature turned off. For $199, the compact ZVOX 315 makes a great musical traveling companion (www.zvoxaudio.com).

Graham introduces the Phantom tonearm

When Bob Graham of Graham Engineering told me some time ago that this new arm was coming, he asked if I wanted a detailed description. But after considering good ol' Bob's penchant for perfection, I decided to wait until this particular Phantom materialized. The arm is now in production and is available for purchase.

Although its design cues are strikingly similar to the Graham 22's, the hand-some-looking Phantom is all new except for its DIN connector block. Graham claims the arm is the only unipivot to feature "true neutral balance." It also, like the Immedia RPM-2 arm, puts the vertical pivot in the plane of play at the stylus tip. The Phantom features dual damping, using fluid as well as a unique magnetic stabilizer, which also sets azimuth and controls the arm's vertical pivoting motion.

The ZVOX 315: A great musical traveling companion, just add iPod. (Is that the MF KW we see below the ZVOX?).

Graham Engineering's new Phantom tonearm.

The Phantom includes many other upgrades to the 2.2 (which remains in production), but the key to the design would seem to be the neutral-balance system, as compared to the 2.2's stable-balance system.

As Graham explains it, stable balance refers to a pivoted system in which the center of gravity is below the pivot point, much as in a laboratory scale. Most unipivots feature a stable balance system, created by hanging the counterweight below the pivot point, or through the use of side-mounted weights. A stable-balance system will have a preferred rest position, any movement away from which will cause the system to create an opposing force to return it to that position: When a record warp deflects the arm from its course, the arm's attempt to return to its preferred rest position causes unwanted stylus deflection. This is why, to be accurate, a stable-balanced system's tracking force must be measured as close to the record surface as possible. When the arm is raised, it wants to be at rest at a lower position and therefore exerts downward pressure. The tracking force increases with the height of the arm above the record surface.

Stable balance thus creates a host of problems, the most obvious of which is moving either the magnet or coil (depending on the cartridge) out of its most ideal operating position, creating nonlinearities in its response. Other potential problems, according to Graham, include increased record wear, soundstage compression, and loss of detail. The greater the warp, the greater the deflection of arm
and stylus, the greater the problem.

In the neutral-balanced Phantom, the pivot point and center of gravity are in the same plane. Graham's Magneglide system (patent pending) uses neodymium magnets to laterally stabilize the arm, and allows the arm to perform with true vertical motion at the stylus tip — an advantage of a gimbaled bearing system. The magnetic stabilization is also claimed to provide part of the system's damping, convenient stylization is also claimed to provide part of the system's damping, convenient stylization is also claimed to provide part of the system's damping, convenient stylization is also claimed to provide part of the system's damping, convenient stylization is also claimed to provide part of the system's damping, convenient stylization is also claimed to provide part of the system's damping.

The system ( patent pending) uses a gimbaled bearing arm. The arm is raised in the main housing, and thus no possible negative sonic residue. Graham also claims that Magneglide eliminates arm wobble when the arm is raised — he says it feels like a conventional fixed-bearing arm.

The Phantom is drop-in compatible with the 22, and there will soon be an SME base adapter. It costs $3900, compared to $3200 for the 22. Graham is a nice guy — he probably should have priced it at $4500 to move it further from the 22's price. I can't wait to get my hands on a Phantom. Meanwhile, by the time you read this, details of Harry Weisfeld's all-new VPI tonearm should be available.

**IN HEAVY ROTATION**

1. Neil Young, *Greendale*, Vapor/Classic Quies SV-P 200gm LPs (3)
4. TV On The Radio, *Desperate Youth, Bloodthirsty Babes*, Touch and Go LPs (2)
5. Humble Pie, *Performance: Rockin' the Fillmore*, A&M/Classic Quies SV-P 200gm LPs (2)
7. Hank Mobley, *Soul Station*, Blue Note/Classic Quies SV-P 200gm mono LP
8. Everly Brothers, *Stories We Could Tell*, RCA/Speakers Corner 180gm LP
10. Ian and Sylvia, *Four Strong Winds*, Vanguard/Cisco 180gm LP

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**ANALOG CORNER**

It's a great time to be into vinyl!

**BAT VK-P105E Super Pak tube phono preamplifier**

Just looking at the arsenal of giant "oil cans" arrayed across the topmost inards of Balanced Audio Technology's VK-P105E Super Pak phono preamp ($8000) is enough to get any analog-driven audiophile's ticker fluttering. This is the latest upgrade of the original VK-P10, which is still available ($4500), as is the SE upgrade ($6000). The SE uses Vishay resistors in a substantially upgraded first gain stage for much lower noise, as well as numerous improvements to the output stage. An upgrade path is offered for the VK-P10 to bring it up to SE or SE Super Pak status.

The basic VK-P10 is an all-tube, three-stage, zero-feedback, fully balanced design with passive RIAA equalization. A pair of switchable, high-quality, dual-tap (12 or 18dB) transformers allows it to be driven with cartridges with outputs as low as 0.1mV and as high as 5mV. The user can access an even wider range of input voltages by adjusting internal switches.

High gain is achieved by using three separate gain stages instead of cascode circuitry, which designer Victor Khomenko says produces high output impedance and poor current drive. The VK-P10 uses high-current plate-loaded stages that he says provide a more precise signal with no cathode-follower buffers. The first gain stage is where cartridge loading, gain switching, and insertion of the optional step-up transformers takes place. Khomenko says that this stage is the source of the VK-P10's low noise levels and its claimed signal/noise ratio of 78dB. High-gain, non-transformer-driven position — among the lowest noise figures ever for a tube-driven phono preamp, he claims. The input stage is fully balanced; BAT recommends using balanced XLR interconnects between your tonearm and the VK-P10.

The SE version substitutes Swedish-made Lundahl step-up transformers that offer 20dB of gain in place of the dual-tap 12/18dB ones supplied with the standard VK-P10. Both transformer types were chosen to mate effectively with the internal impedances of a wide variety of cartridges.

Of course, BAT makes no guarantee that the impedance of the VK-P105E's transformer will provide the ideal match for every cartridge, which is why some users of transformer-driven phono preamps prefer the transformer stage and some don't. However, with 59dB of gain available without the transformer, all but the lowest-gain cartridges should easily be accommodated.

The tubes are selected by RAM Labs. Both gain/buffer stages use 6922s, the lowest-noise figures ever, for a transformer-driven phono preamp. The input stage and buffer stages use 6922s, the second stage direct-coupled to the first in differential-pair mode; the current source is supplied by two 6SN7 triode triodes. The RIAA stage is fully balanced (BAT calls it Flying Passive RIAA) with a common-mode rejection ratio that's nearly infinite. Extensive computer modeling has been used to predict and compensate for the RIAA circuit's interaction with the surrounding gain stages. The VK-P105E's RIAA accuracy is claimed to be typically ±0.1dB, and ±0.2dB "worst case."

Low output impedance is achieved without buffers or cathode followers because BAT believes that a plate-loaded triode circuit sounds best. The VK-P105E has two differential, plate-loaded, high-gain, Russian 6C45 triode tubes connected in parallel to achieve a 300 ohm output impedance low enough for BAT to claim it sufficient for any "normally configured" system — meaning a line stage whose input is at least 3k ohms with less than 100' of normal- to low-capacitance interconnect. At the VK-P105E's output are BAT "6 Pack Stacks" of paper-in-oil coupling capacitors, which BAT says sound best.

The dual-mono, bipolar output power supply features a pair of toroidal transformers and 200 joules of stored energy — more than many power amplifiers. It generates ±150V rails for both
Ear Catching.

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*Not shown
ANALOG CORNER

channels instead of connecting the negative source to ground, which BAT claims reduces dynamic-range linearity.

The Super Pak option (called Depth Charges at the factory) replaces with paper-in-oil capacitors the electrolytic power-supply ones used as bypasses in the first and second gain stages.

Vibration control is achieved by coupling the chassis bottom to a $\frac{1}{2}''$-thick plate integral to the chassis structure, to which the main circuit board (3oz-density bare copper construction) is bolted in 17 places. All components are of high quality, including gold-plated connectors and custom oil-filled capacitors. From the power switch forward, Victor Khomenko assures me, all iterations of the VK-P10 are true dual-mono designs. That’s what your $8000 buys you in the material world. In that world, for eight grand you’re entitled to a chassis as well-built and well-stocked as this one is. But even if you don’t know an anode from Uranus or an ohm from Om, you’re entitled to superb sound for a Kia’s worth of phono preamp (the VK-P10SE Super Pak and a car cost around the same). The BAT delivers.

Setup: A 47k ohm load resistor is permanently connected across the VK-P10SE Super Pak’s input jack. Additional resistive and capacitive loadings via a bank of DIP switches that allow you to choose 100, 1000, or 10,000 ohms. Two sockets let you roll your own input impedance should you so choose. Switches also allow for 100pF, 470pF, or 1000pF of capacitive loading, as well as user-selected via sockets or none at all.

A two-position switch sets the gain to 44dB or 59dB in Direct mode, with the step-up transformers switched out of the circuit. You can then add 12dB or 18dB to either setting. In short, there’s enough gain for any cartridge. The SE version adds 20dB of gain via the Lundahl transformers, for totals of 64 or 79dB.

Rear-panel facilities include balanced and RCA inputs and balanced XLR outputs. BAT offers XLR-RCA adapters for single-ended output, and XLR shorting plugs for the balanced inputs when running unbalanced. A convenient front-panel switch allows you to adjust phase (absolute polarity).

Side view of the BAT VK-P10SE, shows tube line-up, caps, and toroidal power transformers.

The Perfect Vision - November 2003
Neil Gader
"This was first class performance all the way..."  "the RSP-1098 is also an audiophile-grade preamp, that I'd be happy to have in my system even if I never watched another movie again."

Home Theater - December 2003
Steve Guttenberg
"...the RSP-1098 immediately grabbed my heart. The Rotel elicited the sort of full-fledged dimensionality that I normally associate with upper-end audiophile electronics..."
Because of the VK-P10SE Super Pak's unusually low noise (for a tube amp), its 59dB of non-transformer-assisted gain proved sufficient for low-output (0.25mV) moving-coil cartridges whose residual noise some other all-tube phono preamps can't handle. Still, depending on your system, cartridge, and/or taste, you might prefer to run your low-output MC cartridge through the transformer and use the Low Gain setting.

There are even more options with the dual-tap transformer. With low- to medium-output MCs such as the Graham Nightingale II and the Lyra Titan, I found the VK-P10SE Super Pak's sound richer, warmer, and more pleasing overall when I bypassed the transformer. If you're lucky enough to have the scratch to gain admission, your results may differ.

Listening: If I were a mid-lane toiler reviewing $1000-and-under phono preamps and the VK-P10SE Super Pak were suddenly dumped in my lap, I'd foam at the mouth for a while before declaring it to be a religious experience second to none. Time and experience have taught me to temper such outbursts. Let's just say that the VK-P10SE Super Pak is in the very top tier of phono preamps that I have heard. Others in this category that I've reviewed in Stereophile include the Boulder 2008 ($29,000, Vol.25 No.7), which remains at the top because it's the best I've heard and was without fault, followed by, in alphabetical order: the Audio Research Reference ($6500, Vol.23 No.2), Conrad-Johnson Premier 15 ($3995, Vol.22 No.7), Lamm LP2 Deluxe ($6700, Vol.25 No.12), and Manley Steelhead ($7300, Vol.24 No.12, Vol.26 No.10).

Each of these has its strengths and weaknesses. For instance, the C-J Premier 15 was lush and detailed but noisy, and couldn't be used with low-output (ca 0.25mV) MC cartridges unless you like a background of "tube rush." The Lamm LP2 Deluxe was weighty and well-controlled on bottom and just about right in the mids, but the top end was somewhat soft and subdued. The Manley Steelhead, my reference, has the most authoritative dynamics of any of the preamps other than the Boulder 2008, but can sound a bit harmonically threadbare. The Audio Research Reference was accomplished overall but didn't excel anywhere, which is praising with faint praise.

The VK-P10SE Super Pak has considerable strengths: It was superbly quiet, which meant it could be used sans step-up transformer with most cartridges. As best I could determine, given the years and changes of gear in my system, the BAT had the finest top-end performance — extended, detailed, sweet, silky, and not at all unnaturally hard — of all of the above save the Boulder 2008, and it was the most eerily transparent overall as well. It had the advantages of tubes without any of the apparent downsides, though if you like thick, lush, and bloomy, it won't deliver...
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that. Its bottom end had slam, outstanding textural delineation, and harmonic believability. Kick drums, for instance, sounded just right: a perfect blend of the pedal, the plastic head, and the aftershock — not so tight as to be mechanical, or so soft and flaccid as to be unsatisfying.

What I liked best about the VK-P10SE Super Pak was its overall balance and its overwhelming arsenal of musical strengths. That balance was harmonically rich overall, with a velvety-smooth lower midband, but it also had an extended, uncharacteristically fast (for tubes) top end. I wouldn't trade the BAT's upper-octave performance for that of any phono preamp I've heard, including the Boulder 2008. The VK-P10SE satisfied with every kind of music, though its weakest suit was macrodynamics: not bad, but not as expressive in that regard as the Manley Steelhead. At times when I expected to hear the A-bomb explosions I knew the grooves contained, I got everyday ordnance — big bombs, but not the big one. This was not surprising — dynamics is one of the Steelhead's strongest suits — yet the BAT's dynamics were still wide and believable enough to not create growing dissatisfaction. I can't say that of the Lamms L2P Deluxe, which was always a tad too soft on top to my ears — I always wanted to turn up the treble. Your tastes may differ, and your system almost certainly will.

The one thing that separates these great phono preamps from lesser ones might sound trivial: the way they deliver vocal sibilants, which are so difficult to get right. I listened, one after the other, to S&Ps superb new LP edition of Nat King Cole's Just One of Those Things (and more) (S&Ps 508), mastered by Steve Hoffman and Kevin Gray at AcousTech; an original UK Pye pressing of the Kinks' Lola versus Powerman and the Moneyground: Part One (Pye NSLP18359); and Classic Records' superb 200gm reissue of Muddy Waters' Folk Singer (Chess LPS-1483). I was struck by how much detail the BAT pulled from each singer's sounds. It captured the formation of the singer's mouth, the sensation of being able to see his jaws up close as air was expelled, followed by the release of pressure and the mouth reopening, all in a noticeably more convincing way than I'd ever heard before. It's not as if I was paying particular attention to that — I never have before — it's just that the vocals on all of these recordings struck as so eerily convincing. Then I began paying attention to why that was so.

Between the cartridge and the phono preamp, most inexpensive systems either coarsen or gloss over this complex, difficult-to-reproduce event. Some more refined ones soften it to squeeze by, but the BAT and, to a somewhat lesser extent, some of the other phono preamps mentioned here, actually expand and expose the multitude of physical and sonic components comprising sibilants. Extrapolate such attention to detail to everything processed by a phono preamp, and you have an idea of what you get with the BAT VK-P10SE Super Pak or any of the other top-tier phono preamps, and of what you're missing with lesser products.

Through the VK-P10SE Super Pak, the set of Beethoven's piano concertos by pianist Vladimir Ashkenazy, Georg Solti, and the Chicago Symphony I've often referred to (LPs, Decca SXL 6594-7), maynotherequired the level of dynamic contrasts as expressed through the Steelhead, but the tonality, texture, and percussive correctness of the piano and timpani delivered by the BAT were more convincing by a considerable margin; the Steelhead over-emphasized the drum strokes. I've heard from correspondents that, were I to do some tube rolling with NOSAmperex Bugle Boys (I have some), I could enrich the Steelhead's performance without damaging its spectacular dynamics. But my job is to review products as supplied by the manufacturer, not as customized by me, so I haven't done it.

The VK-P10SE Super Pak's soundstaging and imaging were extraordinarily good, aided by its high level of overall transparency. The BAT's ability to deliver fully formed three-dimensional images with body and weight, but without thickening or clouding the picture, was unsurpassed in my listening experience. Instrumental timbres — strings, brass, woodwinds, percussion — had an ideal balance for me, and that remained true with a procession of different-sounding loudspeakers, even as each of these, of course, affected the system's overall sound. When the speakers were richer, such as Sonus Faber's Stradivari Homages, the BAT didn't render too rich a picture; and when the speakers were more analytical, more extended and revealing on top, such as a pair I'm currently reviewing, the BAT didn't glare. Soundstage depth was effortlessly rendered in great detail, without spotlitighting. Rhythm'n'pace were not too fast to gloss over details, or too slow to bog things down — and that held true with every kind of music.

I much preferred the BAT's performance with its transformers switched out. While there was greater gain with them in, I didn't feel the improvement in signal/noise was worth the added brightness and loss of transparency, though of course that will be cartridge-dependent. I did get a chance to run the VK-P10SE Super Pak in balanced mode for a short time when I had Krell electronics in-house for my review of Krell's Resolution 1 loudspeaker, but there were too many variables for me to draw any conclusions about whether balanced or single-ended operation was superior. I can say that balanced mode didn't draw out any improvement in dynamics.

Conclusions: The BAT VK-P10SE Super Pak is one of the top three phono preamplifiers I've heard. In many ways it comes in No.2, after the Boulder 2008 and before the Manley Steelhead. I like the fact that you can buy the standard VK-P10 for $4500 and upgrade as your wallet allows. I wouldn't make too much of the dynamics issue. In direct comparisons with the Manley Steelhead, the BAT wasn't as expressive at the top end of the dynamic scale, but below that, its small-scale dynamic gestures — which is where music lives — were second only to the Boulder's, and its low noise floor made its micro-dynamics performance outstanding.

Right now I'm listening to an original British pressing of España (Decca SXL 508) that I picked up at a garage sale for a buck a few years ago. Believe me, I'm feeling no pain. Vinyl rules! In fact, through the BAT VK-P10SE Super Pak, vinyl is a friendly dictator I'm happy to follow in blind obedience.
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First Watt isn’t a real company, and the F1 power amplifier isn’t a real product. Consequently, this isn’t a real review.

Nelson Pass, who founded the Threshold Corporation in the 1970s and continues to operate the successful Pass Labs, also likes to indulge his more radical side as an audio designer. For some years, his outlet for doing so was Pass DIY (www.passdiy.com), a sort of an online think tank that encourages audio hobbyists to build and elaborate on recent Pass designs that are more niche than needful: ultra-simple and generally low-powered solid-state amplifiers. But the appeal of Pass DIY has been limited to experienced hobbyists to build and elaborate on. And, in a commercial sense, they’ve limited themselves to selling the occasional printed-circuit board — for crazy-low prices, it must be said.

For people who want to hear what lies beyond the tired old megabuck megawatt audio experience yet who don’t wish to spend their evenings reading schematics and testing MOSFETs, there is now First Watt, which Pass describes as “a kitchen-table company.” If the purpose of Pass Labs is to make audio products that answer certain needs, the purpose of First Watt is to ask more questions.

Five to one with a man on First

Nelson Pass says the idea for the F1 came about when he and his colleague Kent English were experimenting with ribbon tweeters — simple drivers that are simply impossible for a voltage amplifier to drive without an in-line matching transformer, owing to the ribbon element’s naturally low impedance. (Said trannie is virtually identical to the kind used between low-output moving-coil cartridges and preamplifiers, only in reverse: High current and low voltage on one side translates into low current and high voltage on the other. To see such a thing at either end of an audio system is to see Ohm’s Law at work, which I truly believe is akin to poetry.)

Pass and English wondered, naturally enough, what would happen if they drove the ribbon with a voltage-actuated cur-

Stereophile, January 2005
rent source, thus allowing them to dispose of the transformer altogether in the interest of simplicity and, presumably, increased transparency of sound. The output impedance of the current source was so high that the amp exhibited virtually no damping factor vis-à-vis the loudspeaker load (again with the Ohm’s Law!), but Pass and English noted that the small and magnetically (if not spiritually) centered ribbon didn’t seem to require electrical damping, arguably because a ribbon element is so low in mass. (Cripes, if it’s not Ohm, it’s that wig-wearing Newton with all his stupid laws! Let’s deregulate electricity so we can start seeing some real hi-fi performance!) Pass and English noted that the ribbon sounded and measured better in every way once its transformer had been removed from the equation. Inventors everywhere will recognize this as the switching on of a cartoon light bulb.

Those events didn’t take place in a vacuum, of course. Somewhere in the background, Pass DIY was busy with a design called the Zen — a very-low-powered solid-state amplifier design that has found favor with a great many do-it-yourselfers. In the original Zen amp of 1996, gain was generated by a single MOSFET operating in common source mode, biased by a second MOSFET that was configured as a constant current source, in-line from the positive voltage supply. After the Zen amplifier came Son of Zen, which used a differential pair of gain MOSFETs, but which dispensed with the constant-current source and instead used resistors to power up the two MOSFETs.

The First Watt F1 could be considered the Out-of-Wedlock Grandson of Zen (in which sense it may also be related to Strom Thurmond). The F1 uses a differential pair of MOSFETs for current gain, driven by a trio of slightly different-spec MOSFETs configured as constant-current sources, the latter making the F1 much more efficient than the passive-source Son of Zen. That makes a total of five MOSFETs per gain stage — and one stage is all you need for 10 class-A watts. In the interest of design simplicity and smoothness of sound, the F1 does not have a negative feedback loop — another reason for its tube-like high impedance and low damping factor — although there’s a feedback mechanism for keeping DC voltages stable, driven by a pair of bipolar small-signal transistors.

The F1’s power supply is nothing if not simple — and elegant. Apart from its Pitrion toroidal power trannie, it’s virtually all dual-mono, with separate rectifier bridges and a quartet of nontesticular reservoir caps for each channel. A few supporting bits aside, that’s just about all there is to it.

The F1 amplifier as a whole is built logically and well, but it isn’t overwrought. Each channel has a single, slender, audiocircuit printed circuit board, with five P-type MOSFETs fastened to the adjacent heatsink extrusions — which themselves comprise the two sides of the chassis. The F1’s differential pair gain circuit lends itself to balanced operation, of course, and XLR inputs are provided alongside the usual single-ended phono jacks. Nelson Pass says that balanced operation gives slightly better performance.

Try this at home

It’s time once again to sneak out from behind the bushes and scare you with the L-word. I forget if I’ve mentioned this already, but my Lowther PM2A drivers sound unusually fine lately, arguably because I cleaned them, and realigned their coils and formers during reassembly. (PM2As’ air gap is only 1mm, and the speaker’s heavy alnico magnet tends to pull its frame out of alignment over time — hence the need for regular maintenance in order to prevent the voice-coil from binding.) I continue to back-load my Lowthers in Medallion horns, which makes it easy to forget you’re listening to the unusually high-flux PM2As (they were originally designed around the Lowther PM6A, which has a smaller magnet), but who really knows?

Theoretically, my speakers are an ideal load for the First Watt F1. The 15-ohm drivers are efficient, and they’re electrically sensitive, too, with an unloaded rating of over 97dB/W/m. That’s owing to a number of things: their powerful magnets (2.1 Tesla), the low mass of their parchment-like paper cones and formers, and the aforementioned teensy-weeny air gap. Back-loading helps, too: The free-air resonance of a 6” Lowther driver is 36Hz, and even a smallish horn like the Medallion keeps the system close to that number, with none of the sharp dips or peaks one might see in a ported box.

And remember, this is a single full-range driver: a bass cone and a treble cone, both propelled by the same voice-coil. (Actually, the highest frequencies seem to emanate from the inner edge of the cone, closest to the voice-coil, and not from the edge of the notorious whizzer itself.) Electrically, there’s nothing either in series or parallel with the amplifier’s output section except that coil: Not a single passive filter in sight.

That’s how it looks on paper; in the real world, the match was excellent, if not entirely perfect.

I’ve owned five different single-ended tube amps over the years — not counting my 1956 Fender Harvard, 1965 Fender Vibro-Champ, and a few weird table radios — and my experience has led me to expect a number of strengths from the breed: An almost scary sense of presence on voices and solo instruments. Superb immediacy in terms of musical nuance. Equally superb drama, with the greatest dynamic contrasts available in home playback when mated to the right speakers. At least good to very good performance in terms of getting the notes and the beats right. A sense of flow and momentum in musical lines that is second to none. And an uncommonly natural way with textures and colors — that beguilingly beautiful, _gooshy_ feel that makes it easy to forget you’re listening to electricity imitate people playing music.

I’ll get the only notable negative out of the way first: In combination with my Lowther-Medallion speakers, the First
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Watt F1 didn’t have that last quality in nearly the same measure as, say, a good 300B amp. My friend Herb Reichert, who has built his share of lovely-sounding things, describes it as a single-ended tube amp’s sense of flesh and blood — and that’s what the F1 was missing. It didn’t sound at all gray or threadbare, but it just wasn’t as fleshy or bloody as I might have liked.

In virtually every other way, the F1 was silly good — one of those products where, during the first couple of minutes of playing time, I laughed out loud to the empty room. I didn’t expect it to be that musical, that much fun to listen to.

First off, I would never in a million years be able to tell if the F1 used tubes or transistors if I didn’t know already. I heard neither the slow bloat of one nor the icy crunch of the other, at their respective worsts: Just music, played well, in a framework of good sound.

The F1’s ability to convey musical nuance — playing technique, I mean, as opposed to violin bows hitting music stands or other such irrelevances — was the quality I came to enjoy the most, and which electrified my listening enjoyment with every record I tried. A friend recently gave me, shall we say, an unauthorized recording made at a bluegrass festival in Roanoke, Virginia, in 1966: the great Bill Monroe, leading an informal mandolin workshop in front of a small audience, with only rhythm-guitar accompaniment by the then-newest member of the Bluegrass Boys, a very young Peter Rowan. 1 Different amplifiers — even very good, music-playing amplifiers — all tend to emphasize certain things, to bring different qualities out of the same recording, and the F1 brought the subtleties of Monroe’s right-hand technique way to the fore, in a manner that other amps I’ve heard recently do not. This was especially interesting because, at the beginning of this recording, Monroe is obviously a bit uncomfortable with the setting. But my F1-powered Lowthers made it obvious that his playing technique altered, and generally improved, over the course of the workshop. I dare say the system let me hear how his grip on the plectrum loosened up over time.

On every sort of record, in fact, the F1 got right to the heart of the matter, and while sonics were fine — imaging precision, depth, freedom from coloration, and all those good things were above average — the First Watt amp was clearly more inter

1) It’s as quiet as a tranquilized mouse.

2) The First Watt F1 retails for $2500. That’s actually quite cheap for all the cutting-edge design work, not to mention music, it offers. But you have to keep in mind that

3) Nelson Pass will make a total of only 100 F1s for sale to the public: Then he’s going to move on to another design.

**THE F1 WAS SILLY GOOD — ONE OF THOSE PRODUCTS WHERE, DURING THE FIRST COUPLE OF MINUTES OF PLAYING TIME, I LAUGHED OUT LOUD TO THE EMPTY ROOM.**

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1 While introducing the song “Walls of Time,” which he cowrote with the Boston-born Rowan, Monroe jokes that he’s “trying to make this Yankee into a Rebel.” The stony silence that follows is the loudest thing on the disc.
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Nothing New Under the Sun

Smart enrolled in a conservatory program in piano technology. Upon graduation, he did a year of postgraduate study in Japan under the auspices of Yamaha, and later spent a year with five of the major piano manufacturers in Europe. However, Smart grew frustrated with the inherent aversion to innovation he perceived in the piano industry. The basics of the concert piano were established in Beethoven's time; by the end of the 19th century, the grand piano had reached its modern form. Cumulatively, over the past 100 years, the pace of innovation has been glacial.

The elemental innovation of the Stuart & Sons piano is a radical rethinking of how the end of the string farthest from the keyboard is coupled to the piano's bridge. The bridge in both a traditional piano and in Stuart's redesign sits directly under the strings. It is made from laminated wood that is rectangular in cross-section, and is curved to follow the shape of the piano's end. The bridge, as its name implies, carries the string's vibration down to the piano's soundboard. But to appreciate Stuart's innovation, a little more background is in order.

Each note on the piano's keyboard is sounded by one string (the bass), two strings (upper bass and lower midrange), or three strings (midrange and treble). This is so because, as the pitch of the notes ascends, the strings become increasingly thinner and shorter. Maintaining an even loudness from note to note requires that the higher notes employ more strings, to make up for the strings' diminishing gauge and length.

At the keyboard end, the string ends first go through, then wrap around square-headed tuning pins. These protrude up from the pin block, through holes in the harp or plate, which is the iron framework that holds the strings in tension. From the lower midrange up, two adjacent strings consist of one long piece of piano wire that is looped at the very farthest end around a hitching post of sorts (called a "hitch pin"), with both ends wrapped around adjacent tuning pins at the keyboard end.

Starting at the keyboard end, the strings pass over (by which I mean they are in contact with) a lateral element of the frame and (usually) through a flattened sort of eye-hook. The goal is to damp the vibrations of the string in the short segment where the tuning mechanism is, yet allow free vibration over the majority of its length, where the string vibrates after being struck by the hammer. At the far end, the challenge is to transmit the string's vibration through the bridge and on to the soundboard; in other words, to transmit the string's vibration while terminating its effective speaking length.

The reason there has to be a string segment beyond the bridge is that the bridge alone could not bear the horizontal pull.
Kudos to Deane

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of the tension of the strings, which in a large concert grand can total 40,000 lbs. The hitch-pin arrangement places the horizontal load on the iron plate while allowing the resting string tension on the wooden bridge to be mostly vertical.

The way grand pianos — up to the present — have terminated the string’s effective speaking length has been to use two offset pins driven into the bridge as the string-coupling device. These offset pins make the string zigzag slightly on its way to the hitch pin. That is, the bridge pins couple and damp the string by means of horizontal deflection (fig.1).

What Wayne Stuart recognized, which apparently no one else ever had (or, if they had, had done nothing about), was that introducing an element of horizontal deflection into the string’s energy path was essentially at odds with the string’s dynamic behavior over its speaking length. This is because the hammer strikes upward at the string from below, and the string then vibrates in a primarily vertical manner. Stuart’s experiments convinced him that this conflict between vertical and horizontal modes of vibration produced noisy transients, impaired pitch security, and resulted in a more rapid decay of the piano’s sound (through destructive interference) than is desirable.

Once he’d grasped this insight, Stuart’s work focused on designing a string-coupling device that would use vertical deflection to terminate the string’s speaking length. (Over and above the requirement of vertical deflection, the new string-coupling device had to allow for the installation and replacement of strings without kinking or breaking them, which was a substantial challenge.)

Stuart’s string-coupling device, which he calls a bridge agraffe (from the French word agrafe, for hook), has three removable lateral rods or pegs, the middle of which goes under and is grasped by three upper, clawlike elements. In total, the string passes over a lateral rod at the rear, goes between two of the claws, under the rod held by the claws, and then over another lateral rod at the front. The Stuart string coupler therefore has three points of deflection, not two, and these are aligned in the vertical plane, not the horizontal (fig.2).

The string coupler itself has as a base a hollow post, which goes into a hole drilled into the bridge, and which provides for a woodscrew as well. During assembly, a silicone compound is placed in the trough between the claws and the front of the agraffe, to provide additional damping.

Because, under the Stuart system, the piano’s bridge is no longer subject to the torsional forces of reaction to the horizontal deflections after the hammer strikes the string, the piano’s soundboard — which is both an acoustical element and a structural element — need not be as thick and heavy as that required by a piano with conventional string coupling. A less massive soundboard has less inertia to overcome as it begins to propagate a musical note, which results in a greater dynamic range. Ah-ha!

As I said, the Stuart & Sons piano represents a radical rethinking of string coupling — and, it should be obvious, a very complete rethinking. Wayne Stuart has been working to bring his vision to reality for about 20 years. It shows, in both the attention to detail and the sonic results. However, even if I had heard the pianos live, which I have not, it might be difficult to apportion credit for the quality of the sound between the bridge agraffe and the underlying reality that Stuart & Sons pianos are designed and built to the highest standards of craftsmanship, and with jovial, even insouciant, disregard for final cost.

All Stuart pianos encompass a full eight octaves (97 keys rather than 88). With five extra keys in the treble and four in the bass, the Stuart pianos cover the range of notes F=21.821Hz to F=moll 558765Hz. Like the Italian Fazioli instruments, the Stuart pianos also have four pedals rather than three, the fourth pedal acting to raise the action in order to shorten the hammer’s stroke, resulting in softer dynamics and sweeter tone.

Although Stuart has shipped pianos to Europe and the UK, to date there have been no North American customers. In part this may be because there is a waiting list of about a year for the pianos, most of which are made to order, usually with veneers from dramatic and unusual Australian woods. Other factors could include the Stuart & Sons pianos’ cost, and that concert artists and concert venues in North America often have special relationships with established piano marques and may be disinclined to upset that particular applecart.

As for cost, I’m robustly (even serenely) confident that you can have a Stuart & Sons concert grand delivered to your home for far less money than it would cost to buy Wavac’s tube amplifiers, which cost $350,000/pair. To put things into perspective. If only for a moment.

About $175,000, allowing for some 2

As distinct from the Bösendorfer Imperial Concert Grand, which also has 97 keys, but nine extra in the bass, and none extra in the treble, Stuart’s piano is the first to have extra keys in the treble.

—Ed.

Stereophile, January 2005
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options, and taking into account customs, insurance, and airfreight, would seem to be the right ballpark, assuming you want the 9' 6" (2.9-meter) concert instrument. The 7' 6" (2.2m) model, designed for residences, costs less. Stuart & Sons' first 7' 6" instrument went to UK actor and comedian Rowan Atkinson. Good for him!

Stuart & Sons' website, www.stuartandsons.com, includes a Quicktime movie that is a fascinating, 20-minute, professionally produced documentary about the pianos and their history. The documentary includes a 3-D CAD rendering of the bridge agraffe, and live shots of the traditional bridge arrangement of the Stuart development. (In this case, a moving picture is worth at least a few thousand words.) There are also quite a few performance segments by recording artists who have recorded using Stuart & Sons pianos. The website has a section showcasing the dozen and a half recordings made to date. This is a website well worth visiting.

Of the CD recordings I have so far heard, I recommend these four standouts. The recorded sound of each is excellent, the piano sound layered and nuanced, the playing first-rank:

**Ian Munro: Mere Bagatelles** (Tall Poppies TP080). Munro plays a set of short pieces for solo piano by various contemporary composers with links to Australia. The music is pianistic and never ugly, and some of it is really quite beautiful; cf. Carl Vine's Bagatelle 5, "Threnody."

**David Stanhope Plays...** (Tall Poppies TP135) is my favorite — a program of transcriptions that are technically very demanding but musically substantial and rewarding. In addition to Busoni's transcription of Bach's Prelude and Fugue in e-flat, there are eight studies by Godowsky on Chopin Etudes. Of particular interest is Liszt's transcription of Beethoven's Symphony 8. Stanhope has technique to burn, a penetrating musical intelligence, and should be much more widely known.

The two above discs are on Australia's Tall Poppies label, which seems to be a connoisseur-run labor of love and is well worth your support (www.tallpoppies.net).

**Beethoven: Complete Piano Concertos**; Gerard Willems, piano; Antony Walker, Sinfonia Australis (ABC 980 046-5). The Stuart & Sons piano's clarity is at times reminiscent of the fortepiano, except with much more power in the bass, of course. Combine that with a sensitive interpreter and an orchestra that plays modern instruments with an awareness of period style, and the result is a bracing, refreshing reacquaintance with these warhorses. Willems has also recorded Beethoven's 32 sonatas on a Stuart & Sons instrument. I haven't heard that set, but, judging by this and the excerpts in the documentary video on the Stuart & Sons website, they're well worth having as well.

**Simon Tedeschi** (Sony Australia SK 89233) is the self-titled debut disc of Australian wunderkind Simon Tedeschi, now in his mid-20s. Although my own interests are better served by the rather austere and cerebral Stanhope disc, I recognize that Tedeschi's lighter and more varied program — which includes selections by Jelly Roll Morton, Fats Waller, Mozart, and Mendelssohn — will have wider appeal. Tedeschi has a very fluid technique, and more than a touch of poetry in his soul. His Rachmaninoff Étude is captivating, and the two Selim Palmgren compositions, from a composer new to me, are very evocative. The Tedeschi disc was recorded in the City Recital Hall, Angel Place, Sydney — an acoustical gem with a program-appropriate seating capacity of about 1200. This was the first commercial recording to be made there. The sound is knockout all around.

Interestingly enough, years ago, Simon Tedeschi was the hand model (the person whose hands were filmed actually playing the piano excerpts) for Noah Taylor, the child actor who played David Helfgott as a young boy in the film Shine (DVD, New Line Cinema 4546). If you haven't seen Shine, you really should. It is the compelling (and largely true) story of an Australian piano prodigy whose perfectionist, domineering, overprotective, and totally possessive father was haunted by the loss of most of his extended family during the Holocaust. Little surprise, then, that the young David Helfgott had a very difficult career in life. After a competition performance, he suffered some sort of episode that caused doctors to subject him to electroshock therapy.

In Shine, Geoffrey Rush is positively brilliant as the adult Helfgott. What is even more remarkable is that Rush apparently plays piano well enough to have acted as his own hand model, with the real Helfgott dubbing the soundtrack. Rush's Academy Award for best actor (1996), against a field that included Tom Cruise, was as richly deserved as it was pleasantly surprising. Lynn Redgrave and John Gielgud give understated but moving performances, while Armin Mueller-Stahl is totally believable as Helfgott's father. Highly recommended.

Finally, lovers of the piano — or anyone who enjoys a well-written memoir — should check out Thad Carhart's The Piano Shop on the Left Bank: Discovering a Forgotten Passion in a Paris Atelier (Random House). Carhart recounts the tentative steps by which he became friends with the standoffish owner of a neighborhood piano-repair shop, and embraced again his childhood love of the piano. It's quite the thing to read while listening to a recording of a Stuart & Sons concert grand!

Comments, questions, or invitations to the party you'll throw after taking delivery of your new Stuart & Sons piano: jmrcds@jmrcds.com.
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Along with speakers and their placement, the greatest influence on the sound of a music system are the acoustics of the room itself. With two-channel stereo, some reflections and reverberations are necessary in order to maintain the perception that one is listening in a real space. So, while many experts recommend having a “dead” end behind and near the speakers that absorbs most sound, few suggest such treatment for the entire room. With too few sonic reflections, the stereo image would narrow; without the aid of “room gain” to enrich the bass, the sounds of instruments and voices would be thin. Listening in an anechoic chamber is interesting and informative, but far from pleasurable.

For a while, I labored under the misconception that multichannel setups were greatly immune from the problems of room acoustics because the sound is dominated by the acoustical cues of the reproduced ambience, whether real or synthesized. Of course, that’s as wrong for surround sound as it is for stereo—the room’s acoustical signature abides, and the new surround cues are merely superimposed on them. Still, it’s much easier with multichannel to “listen through” the room into the transmitted reality, if only because there are more cues to better camouflage the room sound.

For years, I’ve tried to listen straight through the acoustical elephant in the room—the room itself. My room’s dimensions of 16’ by 16’ by 8’ high, however, made for very discrete, predictable, and significant nodes and nulls. A 35Hz mode was made inevitable by the room’s length and width, while the ceiling height supported the first harmonic of that mode, at 70Hz. So when I tuned an ASC SubTrap to 70Hz, no wonder it did wonders. However, the SubTrap had no effect on the higher-frequency harmonics or the slap echo between the walls. A more comprehensive approach was needed to deal with the dimensional resonant modes, as well as with the abiding liveliness of the plasterboard-enclosed space.

RealTraps and the Real World
What turned me from acceptance to action was a visit my wife and I made to Bob Ludwig’s Gateway Mastering Studios in Portland, Maine. We were astonished by the sound in the main mastering room—or, rather, the lack of sound. Sure, it was dead quiet, but our voices were listened to a few excerpts from Benjamin Zander’s multichannel SACD of Mahler’s Symphony 5 (Telarc SACD-80569), which sounded better than it has in any other demo. I’d heard this recording at home and at a stupendous Halcro-Revel demo at the 2003 Consumer Electronics Show, but those sounds paled compared to what I heard at Gateway. Of course, all of Bob’s equipment is topnotch; but by discarding the cloak of room acoustics, the system could communicate the sound of the music transparently. I want that.

I did some research on acoustical treatment and found it generally obtrusive, visually and/or physically. The bottom line is that one cannot deal effectively with low frequencies without treatments of large size, and we’re not yet ready to accommodate stacks of tubes and boxes in what is also our den and relaxation space. Still, I was committed to doing something.

RealTraps (www.realtraps.com) just happens to be located in our hometown in Connecticut. After some telephone discussions, we visited the home of RealTraps’ Ethan Winer, where I experienced an acoustic nearly as neutral as that at Gateway. My wife, however, was not thrilled to see that it came at the price of dozens of Real Trap panels covering almost every room surface, including the ceiling.

Acting boldly, I arranged to borrow some RealTraps. Fortunately, my wife was out in the garden when Winer and Doug Ferrara drove up with a truckload of panels and set them up. They put three MondoTraps ($279.99; all prices are for single units) across the back of the room, two MiniTraps ($179.99) angled across the wall/floor junction between the front speakers, a 2’ by 2’ Mini Trap ($119.99) in each rear floor corner, and a pair of HF Mini Traps ($179.99) on stands ($60), one at the first reflection point on each side of the room. Although they urged me to take even more panels (their philosophy seems to be that more is better), I demurred. I had hoped that these flat panels (2.25–4” thick) of fiberglass, with cosmetically neutral covers and frames, might not upset the décor or my wife. However, as Ethan
Winer is quick to instruct, Real-Traps are more effective at low frequencies when placed across the junction of room boundaries, and most effective in corners. But even these few Traps were more than my wife could endure; only assurances of their eventual removal placated her.

However, everyone who has heard the room both before and after agrees that the RealTraps have made a major improvement, usually along the same lines as my impressions at Gateway Mastering. Every sound in the room, real or reproduced, is more defined in character and location, an effect I can demonstrate simply by walking into the room while speaking. Instruments and voices from well-recorded discs sound more natural and varied, as they do in concert halls or clubs, without the homogenizing effect of a constant room acoustic. Also, while I can now better define the location of reproduced sounds in their transmitted ambience, it is much more difficult to localize the speakers in the room. Even former colleague Jonathan Scull, who was making an otherwise social visit, remarked about how the treatment made my Paradigm Reference Studios seem to disappear.

The human brain has a difficult time localizing a side sound from front and rear speakers, and poor acoustics make the task harder. In practice, some otherwise satisfying recordings, such as Willy Nelson’s Night and Day DVD-Audio disc (Surrounded By Entertainment SBE-1001-9), can distract the listener with instruments seemingly isolated in the rear channels. No longer. Sure, the instruments still wrapped around me, but now as a continuous ensemble from front to back. Finally, the speakers simply sounded smoother and more integrated than before. This was best demonstrated with the recordings of the Berlioz Requiem. It is all too common, in massive passages such as the Tuba Mirum, for the chorus and orchestra to be engulfed by the timpani or for the brass to sound forward and disconnected from the ensemble. But whether with Robert Spano/Atlanta Symphony SACD (Telarc SACD-60627) or the Maurice Abravanel/Utah Symphony (DVD-A, Silverline 288238-9), everything hung together. Quiet portions were delicately detailed, and the big stuff wasn’t just loud, but huge.

How was this accomplished? Using room analysis and measurement, I found that the 35Hz fundamental gave a −6dB null in the listening area, but that was alleviated when the subwoofer was moved close to the rear corner. The fundamental resonance of the room height and the first harmonic of the length and width modes coincided for a 70Hz peak on the order of 8dB, but this was not the biggest problem. The next harmonic (for all three
Music in the Round

dimensions) was at +18dB at 140Hz. That was the elephant in the room, and it was essentially erased by the RealTraps.

The other major improvements were in imaging, detail, and soundstage width, due to the absorption of the first lateral reflections wrought by the stand-mounted HF MiniTraps. I know this for certain because I stowed these units in the shower on days when the housekeeper cleaned the room; the A/B comparison was decisive.

The RealTraps are the real thing. For a hypothetical investment of $2000, they so improved the room’s acoustics that every recording and piece of electronics sounded better. I doubt if a similar investment in any other component could yield as much satisfaction. However, they do impose their presence visually, and the stand-mounted HF MiniTraps, so essential to the imaging, are in the way all the time. Still, even my wife grudgingly admits their value. Mebbe there’s still hope...

SOS: Getting to the bottom

But for all the RealTraps’ blandishments, I simply could not use enough of them to deal effectively with that 70Hz mode. Certainly, the ASC SubTrap could do that job—but then I found a much smaller and nearly ideal solution.

In the past, I have had the pleasure of using and reviewing both the TacT RCS (digital) and Rives PARC (analog) room-correction systems. Both of these are quite flexible, offering multiband equalization to correct for room modes, but neither can fully take the place of physical acoustical treatments of the midrange and treble. Eventually, I hope to try their multichannel equivalents, the TacTTCS and the Rives PARC+. But because I’d already whittled the problem down to a single peak at 70Hz, I thought I might just build a little bandpass notch filter and be done with it.

Instead, I obtained the ready-to-wear ACE! Subwoofer Optimization System, or SOS ($269), a single-band, self-calibrating parametric EQ (www.aceica.com/description.htm). It operates between 20 and 80Hz with adjustable gain and Q, and works with any powered subwoofer that lacks an active crossover (or has one that can be bypassed).

The SOS comes in a small extruded-frame box with switches on one side and connectors on the other. Installation and setup are quite simple: 1) Connect the output RCA jack directly to your subwoofer with the provided cable or one of your choice. 2) Connect the provided microphone and place it at the listening position. (I taped it to the top of a photographer’s tripod.) 3) Make sure the switches are set to Operate, Filter, and Normal. 4) Power up the SOS by plugging in the provided wall-wart power supply. 5) Flip the switch from Operate to Calibrate. 6) Stand back!

The unit will sweep through several series of test tones; if calibration is successful, the green Cal’d LED will illuminate. Switch over to Operate-Filter-Normal and you’re good to go. Until recalibrated, the SOS will remember the filter parameters, even if you unplug it. There is a Bypass option, as well as the ability to inject test tones, if you want to assess the SOS effectiveness by ear or instrument. That’s all there is to it.

Before I regale you with a description of how great this little gadget is, let me remind you that it is not the equivalent of a multiband equalizer such as the Rives PARC, and that, unlike the TacT, it does nothing in the time domain. On the other hand, subwoofers are rarely used over much more than a two-octave range (20–80Hz), and, depending on your room,
there may not be more than one offending mode in that range. That was the case
in my room; the SOS suited it to a T.

The most significant improvement was
that my Paradigm Servo-15 subwoofer
simply disappeared as a localizable source
when used solely as an LF speaker, or
with bass management set to 80 Hz.
Normally, I subject only the rear channels (Paradigm
Studio/20s or Magnepan
MGMC1s) to bass management, as I run
the front three Studio/60s full-range.
However, with the SOS controlling the
Servo-15, the entire system became tighter
in the bass, as well as much more solid and
powerful. I no longer had to pay the usual
price of bass management: more mid-
to low bass in the sub’s vicinity.

The best demonstration of the effect
was with the RCA Living Stereo SACD
of the Saint-Saëns “Organ Symphony”
(BMG Classics 8287-66139-2). This is
not a surround recording—all three
channels are up front. Running the three
Reference Studio/60s full-range was very
satisfying, but there was a lack of ultimate
power and extension. Switching in the
SOS and the sub with an 80 Hz crossover
strengthened the extreme bottom end,
especially in the second movement, but
it still came exclusively from the front. In
addition, whatever the Studios were con-
tributing to the 70 Hz mode was some-
what attenuated, but this time by the
trolley of the Outlaw ICBM.

The SOS was just perfect within its
limited capabilities, and is worth a try if
your room doesn’t saddle you with mul-
tiple peaks and nulls in need of correc-
tion. Full-range speakers will, of course,
still energize the low-frequency room
modes; the SOS can’t help them. Its should
work fine for those with smaller main
speakers using bass management in all
channels. But even if the SOS can cure
only the major problem, that may be all
you need.

**Linar Model 10: rethinking the multi-channel amplifier**

Until the audio industry gets its act
together and offers us a truly universal
digital interface, we’re going to be using
preamplifiers and power amplifiers with
analog inputs. Why not put them in one
box? After all, there are many integrated
stereo amps. Well, the Linar Model 10
($4200) is just that: a 5.1-channel preamp
with a five-channel power amplifier in
the same chassis (www.linaraudio.com/
model10.htm).

This 60-lb block, a high-end amp from
designer Victor Sima, sports two 750VA
toroidal transformers, Teflon-insulated
machined RCA connectors, and a circuit
free of signal-path capacitors and global
feedback. It has five stereo inputs and one
six-channel input (designated Aux 1),
and five power amps rated at 120W each into
8 ohms. The dual line-level subwoofer
outputs carry full-bandwidth mono sig-
als when a stereo source is selected.

The Linar 10’s front panel looks like
a power amp with a small green LCD
display and five pushbuttons: Input,
Power, Tape Monitor, and Power
Up/Down. The LCD indicates
selection and volume level in each of
the modes, but was generally too small
to read from my listening position.
The rear panel has five pairs of binding posts
across the top (L/C/R/LS/RS), and
RCA jacks across the middle for its line-
level inputs and outputs.

But after I’d hooked up the inputs and
outputs, I never laid a hand on the Linar 10
again, preferring the very capable remote
control. This little beauty has direct-access
buttons for each input: CD, Tuner, Aux 1
(multi-channel), Aux 2, Aux 3, Mute, Vol-
ume Up/Down, Tape Monitor (On/Off),
Display (On/Off), and, of course, Power
On/Off. In addition, there’s a button to
duplicate the stereo L/R signals at the
LS/RS outputs for stereo in four channels,
and another, labeled Rear Volume, that	oggles
the volume buttons from controlling
all channels to setting levels independently
for the subwoofer or rear channels. Note
that, in the Stereo in 4 Channels mode, the
Model 10 could also be used for biamping
stereo speakers or for powering a stereo pair
in another room. Strangely, there is no
simple facility for left/right balance adjustment
in multichannel, and the workaround
for stereo is kludgy. Not a big problem.
That's right. The AudioQuest Dielectric-Bias System (DBS, patent pending) is all about time, about minimizing time and phase distortion caused by insulation. Since its introduction in 2003, DBS has wowed listeners with its quiet “black” background, with how DBS allows music, voice and sound-effects to be more beautiful, more intelligible, more dynamic ... more stimulating! It was about time the DBS family grew beyond the original four interconnects and six speaker cables. AudioQuest is proud to announce the arrival of:

**CV-4 DBS speaker cable** – This killer little cable made a huge place for itself when first introduced in 1999. Then in 2003, CV-4 became even more refined and effective with the inclusion of PSC+ copper. Now, with 36V DBS, CV-4 further redefines what’s possible in a reasonable size, reasonable price speaker cable. $385/8ft pair.

**Hawkeye and Eagle Eye DBS digital coax** – You might guess from the “Eye” part of these names that they are video cables. When used in triplets (for example), these are state-of-the-art component video cables. However, their primary calling is as digital-coax (S/P-DIF). Digital audio’s evil enemy is “jitter” ... time domain distortion which causes an effective loss of bandwidth. DBS to the rescue! 36V Hawkeye and 72V Eagle Eye will open your eyes and your ears. $350 and $650/1m.

**Raven DBS AES/EBU**: What Eagle Eye is to S/P-DIF, Raven is to AES/EBU balanced digital. $650/1m.

**Sub-3 DBS subwoofer cable** – While all AudioQuest interconnects have great bass performance and make excellent high-performance subwoofer cables, AQ's new Sub-Series models are dedicated sub-only cables which include an additional chassis-to-chassis ground connection to eliminate occasional hum problems. Models X, 1 and 3 use silver-plated conductors to enhance low bass performance (these models should not be used for full range audio). Sub-1 uses 2.5% silver in PE Air-Tubes. Sub-3 adds 36V DBS and 6.1% silver to really make your woofer pound the floor. Sub-1 $100/3m, Sub-3 $200/3m.

**LeoPard DBS tonearm cable** – Finally a full solution for the one cable in a system which otherwise never gets even partially “warmed-up.” Even if records were played constantly, the voltage field on a tonearm cable would still be irrelevant; the dielectric gets no bias. This single small flexible cable, using Teflon Air-Tubes and PSS silver, carries the balanced phono signal up to its FPC RCA or XLR plugs with unprecedented clarity. And yes, the “P” in LeoPard is capitalized on purpose. $450/1.2m.

**+36V DBS Upgrade Kit** – If you are already enjoying the benefits of DBS and would like to turbo-charge your cables by increasing the voltage, a +36V DBS Upgrade Kit will add 36V to whatever voltage you have now. If you’ve already got 24V, adding this kit will take you to 60V. While 24V already provides most of the DBS benefit, there’s not much else you can do for $125 to equal the extra solidity and cruising power that higher DBS voltage provides. Kit includes 2 x 36V DBS packs along with multiple adaptor cables and sizes of DBS rubber bands.
Meridian’s multi-award-winning 800 Reference Series has a new stable-mate: the 808 Signature CD Player, shown right.

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I used the Linar 10 as an integrated amplifier, as it was designed to be, but also as a power amp, with the McCormack MAP-1 handling selection and levels. In either role, the sound was always ample and smooth, but just a little smoother with the Linar on its own. Background noise was inaudible at any level setting, and there was plenty of power for the Paradigms. All functions worked smoothly and silently from the get-go, except for a fairly quiet burp on power-up.

I might characterize the Linar's sound as warm, not because of any rolloff in the extreme treble but because the high frequencies are gently softer and the midbass generous. Compared with, say, the MAP-1 or the Bryston 9B-ST, the Linar 10 had a little more of a velvet glove covering the steel fist that was notably present. Overall, it resembled the Bel Canto digital amps harmonically, but without their granitic bass. If that suggests Goldilocks' choice of not too hard and not too soft, you get the idea. The Linar 10 was clean with every music and film selection, its rendition of soundstage depth and width excellent, its dynamics impressive. The Linar did well with the Paradigm Studio/60s, but it was a particularly felicitous match with the Magnepan MGMC1s, which sang as sweetly as they do with much more expensive amps.

As a single-box solution, the Linar 10 is pretty much without direct competition, so I can compare it only to separate preamps and amps. Having done that, I think it competitive in sound quality with any that has passed through my multichannel system, and all of the combinations of those separates cost much more than the Linar on its own. With a universal player and stereo sources, the Linar 10 provides an audiophile's transition from stereo to multichannel. Those who've made that transition can feed the outputs from a multichannel processor or receiver into the Linar 10's multichannel input and still enjoy all-analog stereo from the other inputs.

The only issue is whether this clean, hefty all-in-one suits your needs. I had to add the Zektor MAS3 that I reviewed in December to accommodate multiple multichannel inputs, but for most folks, the Linar Model 10 and a decent universal player would make a great audio system. And think of what you'd save in interconnects!

Next time: The promised discussion of cables and power treatment, an upscale universal player, and more Recordings in the Round.

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Pick an expletive — one you would normally use to express deep intellectual frustration — but don’t vocalize it. Hold it in reserve for a few minutes, letting it simmer to concentrate its intensity. I’ll tell you when to let rip.

In an October 2004 “Industry Update” (p.29), Paul Messenger reported on a paper presented recently to the Institute of Acoustics in the UK on the subject of loudspeaker bass response. The paper begins with the observation that the subjective bass performance of different speaker designs can vary considerably, and concludes that phase behavior (group delay) and time-domain behavior (ringing) are the factors responsible for these disparities. P.R. Newell, K.R. Holland, P. Mapp, “The Perception of the Reception of a Deception,” paper presented at the Institute of Acoustics.

A friend in the UK audio industry who was also inspired to read the paper by PM’s piece commented to me that this work actually tells us nothing we didn’t already know — an assessment with which I concur, particularly as it offers no suggestion as to how phase and time-domain performance can be stirred together with the amplitude response into an overall figure of merit for speaker bass performance. But as a reminder of an aspect of loudspeaker behavior that remains poorly defined, the paper struck me as timely — not least because for some months I have been pondering another aspect of the problem.

For many of us on the front line of equipment reviewing, difficulties of interpretation are secondary to the problem of being able to measure loudspeakers accurately at lower frequencies. Although today’s equipment reviewer can, without having to spend a small fortune on lab facilities, make most of...
the standard audio measurements to an accuracy similar to what manufacturers can achieve, this is one notable exception.

In fact, most reviewers who measure loudspeakers — John Atkinson and I fall into this category — routinely fail to make measurements that address lower-frequency behavior with anything like enough resolution. Note that I say lower-frequency, not low-frequency behavior — the problem typically begins to manifest itself below 1kHz. Actually, the principal problem area, as we shall see, is lower-midrange frequencies rather than bass frequencies per se, for which tricks exist to get us out of the mire.

To see why this is so, let's begin with a quick overview of the methods by which loudspeakers can be measured — or, rather, of the environments in which this can be done, which is the key to this story.

When loudspeaker measurements are referred to as freefield, it means that they are unaffected by the presence of a containing space. A true freefield measuring environment is difficult to achieve because it implies that all reflective surfaces are sufficiently removed from the speaker to have negligible effect on the measurement. Practically the best that can be done is to raise the speaker a long way off the ground, typically on a telescopic pole, in a location well away from buildings or other sources of reflection other than the ground itself (and, of course, from any sources of extraneous noise). This method was quite often used in the past, but its impracticality is obvious. Even assuming that you have a suitable wilderness available and can afford the telescopic pole, you remain at the mercy of the elements, particularly wind and rain.

It was to achieve almost freefield conditions in a more practicable way that the anechoic chamber was invented. Here the aim is not to remove all reflective surfaces to a safe distance, but to cover them with sufficient sound-absorbent material that they, in effect, disappear acoustically. Actually, size still matters: large anechoic chambers are better than smaller ones in that they permit accurate results to be achieved down to lower frequencies, although even the largest are rarely accurate below about 70Hz. Corrections are usually established to account for this, allowing reliable results to be had down to the lowest audible frequencies.

It goes without saying that building and equipping an anechoic chamber represents a substantial investment — one well beyond the individual reviewer or even magazine. This difficulty was sometimes sidestepped in years past by audio magazines hiring an anechoic chamber (a costly exercise in itself), but the bottom fell out of that market with the introduction of what are sometimes regarded, wrongly, as a panacea: time-windowed measurement systems, of which DRA Labs' MLSSA is unquestionably the best known.

Time-windowed measurement systems were a breakthrough because they made it possible for the first time to test loudspeakers in a normal reverberant environment. To achieve this, first they replaced the traditional swept sinewave with a broad-spectrum test signal. Initially, impulses were used (for example, by KEF, when it pioneered this methodology in the 1970s), although today maximum-length sequence (MLS) pseudo-random noise is routinely preferred for its higher signal energy. Second, they analyzed only that portion of the measured impulse response captured before the arrival of the first reflection from the nearest room boundary.

Eliminating reflections from the measurement in this way allows anechoic testing to be conducted in a normal room. Little wonder, then, that time-windowed measurement was greeted as a great democratizing technology, one that allowed almost anyone (actually, the expenditure involved is still not trivial) to perform speaker measurements without requiring access to an anechoic chamber. But this revolution (even though it did not occur in the 1960s) wasn't everything it was sometimes cracked up to be. By limiting the time window of a measurement, you also limit its frequency resolution. The relationship is a simple one: if you apply a time window of 6 milliseconds (0.006s — not unusual for measurements conducted in a typical domestic room), then the frequency resolution of the measurement will be limited to 1/0.006 = 167Hz.

This does not mean, as is sometimes inferred, that the measurement becomes unreliable below 167Hz — the problems begin much higher in frequency than that. What it does mean is that the frequency range is divided up into slices 167Hz wide, and any features of the loudspeaker's response that occur within one slice will be agglomerated in the measurement. That's of little consequence at a frequency of, say, 10kHz. But below 1kHz, this resolution amounts to a mere six frequency slices — obviously not enough to reveal useful detail.

Figs.1–3 (originally published in the English magazine Hi-Fi News) show just how serious the ramifications are of frequency reso-
“Oops...this stuff was supposed to be kept top secret until CES!!!”

Dear Reader,

The rumor mill is buzzing away. Guess I might as well spill the beans (southern-style, of course)!

Avantgarde Acoustic—Alexis Park 1904—CES 2005

Yes, it’s a fact that there’s an all-new Avantgarde Acoustic speaker on the way. And yes, it will be debuting at CES 2005.

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And yes, we’ll be debuting the astonishing new single-ended Avantgarde power amplifier, which breaks new ground in several important areas. That’s how it’s already gotten a patent or two...

Finally, the long awaited battery-powered Avantgarde preamplifier will be on demonstration. Yep, it’s pretty trick, with a whole bunch of innovative thinking and circuit design.

Did I mention that none of that new, trick, patented stuff is worth beans (southern-style again), if these pieces didn’t sound spectacular? Just let me say, no problem on the spectacular sound!

Zanden Audio—Alexis Park 1905—CES 2005

Zanden’s legendary designer, Kazutoshi Yamada, hasn’t exactly been resting on his laurels!

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olution of this order. To generate them, I first created a simulated impulse response, in MLSSA's native TIM file format, for a closed-box (acoustic-suspension) loudspeaker having a resonance frequency of 60Hz and a total system Q of 0.707 (i.e., a maximally flat or Butterworth bass alignment). To this were added six simulated cabinet resonances, at frequencies from 145 to 691Hz, with Qs and relative levels equivalent to those identified by W.R. Stevens many years ago, in measurements of a real loudspeaker cabinet. Then the impulse response was analyzed with MLSSA using time windows of 6ms, 23ms, and 217ms, the last being the longest available at the selected sampling rate.

Fig. 1 shows the frequency response and cumulative spectral-decay ("waterfall") plots obtained at the longest, 217ms window length. Here everything is as it ought to be. The bass response falls monotonically to -3dB at 60Hz, just as it should, and all six resonances are clearly resolved, both in the frequency-response and waterfall plots. This is nirvana, so hang on tight to it.

Fig. 2 shows what happens when the time window is reduced to 23ms: in the frequency-response graph the bass rolloff is no longer quite right, and the individual resonance peaks are beginning to merge. In the waterfall, matters are even worse: only the 691Hz resonance is now clearly resolved. With the 6ms time window (fig. 3), absolutely everything is obscured. The merging of the resonances makes it appear as if the speaker has a lower-midrange hump in its response, while the waterfall has become meaningless mélange. And this, remember, is typical of results achieved by reviewers who, as I do, use their listening rooms for time-windowed speaker measurements.

The tragedy of this situation is not that it prevents accurate measurement of a speaker's bass response. As we will see, that is a problem that can be overcome quite easily. What really hurts is that this time-window limitation prevents the identification of cabinet resonances in just the frequency range where they typically occur. Cabinet resonances are known to be a major factor, perhaps the major factor, in determining a loudspeaker's sound quality, yet most reviewers who have gone to the trouble and expense of arming themselves with MLSSA or one of its clones will be unable, for the reasons described, to identify them. Nor will they be able to identify resonances in the speaker stand, which may be just as significant.

Still got that chosen expletive at the ready? Insert here.

The nearfield maneuver

The standard means of circumventing this time-window restriction to obtain an accurate picture of bass performance is to perform a nearfield measurement, a technique developed more than 30 years ago by Don Keele when he

3 Since the summer of 2000, I have been measuring loudspeakers outdoors in an enclosed yard, which allows the speaker to be raised around 6' from the ground on a high stand. However, this still doesn't give me more than 6ms or so of true anechoic impulse response.


Fig. 3 Same as fig. 1 but with measurement time window reduced still further, to 6ms.
worked at Electro-Voice. This suppresses the room’s contribution by placing the measurement microphone close up to the center of each of the speaker’s bass radiators. I say radiators rather than diaphragms because, in the case of a reflex (ported) design, the port radiates sound as well as the bass driver, and both have to be accounted for.

With the room’s contribution suppressed by such close microphone placement, the measurement window can be opened out sufficiently to provide the frequency resolution necessary to capture an accurate bass response. This can then be stitched together with the farfield response (measured conventionally, with the microphone 1m, or whatever the chosen distance, away) to create a response trace that covers the entire audible spectrum. But there are significant limitations to this approach. First, there is some uncertainty involved in weighting the contributions when more than one bass radiator is involved. Second, nearfield measurement does not capture cabinet diffraction effects, which means it does not represent the true farfield output at higher frequencies — something that can cause errors when combining the near- and farfield responses. Third, and most important in the current context, nearfield measurement tells you nothing useful about radiation from the cabinet walls, so it does nothing to solve the problem of quantifying cabinet (or stand) resonances.

To achieve that, there is no alternative but to improve the frequency resolution of the conventional farfield measurement process. And that, as already described, entails widening the measurement time window. But how can this be achieved without a tall pole or anechoic chamber?

The first step, naturally enough, is to avail yourself of a larger room in which to make the measurement, thereby increasing the time delay before the arrival of the first boundary reflection. A hundred yards or so down the road from where I live is a community hall that, because it meets some badminton regulation, has a ceiling about 9m high. It was while I was giving blood there one time, staring at said lofty ceiling, that it dawned on me: here was an ideal space for loudspeaker measurement.

Hamstrung initially by conventional thinking, I began to conceive mechanical contrivances to hoist speakers (and the measurement microphone) 4.5m off the floor, so as to place them equidistant from the hall’s floor and ceiling. That way, I should be able to open out the time window, for a 1m measurement distance, to around 23ms — much better than the 6ms or so I achieve at home, to be sure, but, as Fig.2 clearly shows, still not enough. As the prospect of finding a room of significantly larger dimensions seemed remote, my thoughts turned to the various means of post-processing that have been proposed for removing reflections from speaker measurements — but the prospect of getting them to work, and of verifying the accuracy of the results, looked daunting.

It was on a trip to Harman International’s headquarters in Northridge, California, last summer that a better, simpler approach hove into view. While on a whistle-stop tour of the JBL Professional division, I was shown the roof space where they perform bass measurements using Mark Gander’s ground-plane technique, developed at JBL in the early 1980s. This is illustrated in its usual form in Fig.4. Both the speaker and the microphone are placed on a hard (ie, reflective) planar surface, typically a large, flat roof (as at Northridge) or an empty parking lot. Effectively, there are now two microphones and two speakers involved in the measurement: the real microphone and speaker and their virtual partners, reflected in the acoustic mirror formed by the ground plane. But the close spacing of the microphone to the reflective surface means that this doubling up causes interference errors only at high frequencies; at low frequencies, the only downside is that the speaker now appears to have a baffle twice as wide as it actually is, which affects the measured frequency resolution of the conventional farfield measurement.

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Time dilation

Fig.4 Mark Gander’s ground-plane measurement technique. The hard, reflective surface acts as an acoustic mirror, but the close placement of the microphone to it postpones interference effects to high frequencies.

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response where diffraction effects begin to set in. Although this is something you have to be aware of when using this technique to measure frequency response, it's of no practical significance to my intended purpose of being able to measure cabinet resonances.

The ground-plane method is usually thought of as an outdoor technique, but there is no reason it cannot be used indoors, provided the floor is sufficiently reflective and a gated measurement technique is used to window out the wall and ceiling reflections. The prospect of using this approach in the community hall appealed to me for two reasons. First, it removes the need to contrive a means of precariously lifting speakers 4.5m off the floor. Second, by adopting the setup pictured in fig.5, the speaker is lifted from the floor, freeing up its panels to make their contribution to its normal resonance behavior — a speaker stand can also be included in the measurement. This arrangement puts the microphone off the normal listening axis, but that should not be a significant problem at the frequencies of concern here.

I had also hoped that the ground-plane approach would offer a wider time window. So you can imagine my disappointment when, unable to recall the hall's width, I walked down the road to pace it out and found it to be about 10m, which meant a negligible improvement. More expletives.

More planes
It was a diagram of the source-image model of a loudspeaker in a room corner that prompted my realization that there is a straightforward way of extending the ground-plane method to advantage. Because it is usually an outdoor technique, it is normal to invoke only one reflective plane. But there is no reason the principle cannot be extended to two mutually perpendicular planes by placing the microphone at the junction of a wall and floor (fig.6), or even to three planes by placing it in a room corner. Depending on the room dimensions, one or other method will allow a considerable increase in the first-reflection arrival delay over the one-plane case. (Strictly, the delay to the first reflection is actually very short because the microphone is positioned close to but not flush with the reflecting surface(s). But let's not be pedantic — you know what I mean.)

In the community hall, this approach makes a big difference to the achievable measurement time window. Placing the speaker and microphone halfway along the room's long wall should open it out to about 45ms — a figure that, with these room proportions, cannot be improved on by using a corner position instead. The principal practical requirement, as in the single-plane case, is that the two surfaces be almost perfectly reflective, which they are in this instance: a hardwood floor on a concrete base and a plastered brick wall. As far as physical setup is concerned, this is about the best I can ever hope to achieve.

But there may be another stratagem that can improve the results still further. In 1983, Laurie Fincham, then at KEF, presented two intriguing papers to the 74th AES convention in New York. The first described the subjective significance of a speaker's group-delay performance at bass frequencies, thereby predating Newell, Holland, and Mapp's recent observations by two decades. The second detailed how KEF had succeeded in achieving an accuracy of 1dB at 20Hz when using impulses to measure a speaker's full-space frequency response in a reverberant room measuring just 7.6m in all three dimensions — a space in which you would expect to achieve a frequency resolution of only 52Hz for a 1m measurement.

Without going into detail, KEF's method involves prefiltering the test signal to attenuate its LF content, so that the resulting impulse response from the speaker decays sufficiently quickly to avoid truncation effects due to time windowing. Appropriate correction is then applied to the resulting frequency response. Although KEF's system used an impulse test signal, there is no reason the same technique should not be applied to measurements made using the noise-like MLS signal — which opens up the intriguing possibility of combining the elaborated ground-plane setup with a prefiltered test signal, for even better results.

So far, this is only a thought experiment; I haven't yet tried either of these ideas in practice. But I've booked the community hall and have high hopes for the outcome. I'll let you know if they were realized when we next commune, in the April 2005 Stereophile.

Editor's Note: In 1954, a New York writer and teacher reinvented the world of audio with the modest-looking Acoustic Research AR-1 loudspeaker. A small fraction of the size of the behemoths that were then de rigueur for the reproduction of bass frequencies, Edgar Villchur’s loudspeaker went as low with less distortion. Perhaps more importantly, the AR-1 pioneered both the science of speaker design and the idea that a low-frequency drive-unit could not be successfully engineered without the properties of the enclosure being taken into account.

To celebrate the fiftieth anniversary of Villchur’s revolutionary idea and his founding (with the late Henry Kloss) of the Acoustic Research company, I asked David Lander to interview not only Villchur but also Roy Allison. Allison played a major role in the company’s fortunes before leaving in 1972, but more importantly, extended Villchur’s idea of system engineering to one where a complete loudspeaker should not be designed without taking the properties of the listening room into account.

—John Atkinson
EDGAR VILLCHUR

THINKING INSIDE THE BOX

Edgar Villchur's acoustic-suspension loudspeaker was an idea as big as its cabinet was small.

By the time he entered the City College of New York in 1933, Villchur knew he wanted to be an inventor. He was attracted to engineering, but a passion for painting and theatrical set design led him to major in art, and he earned a master's degree in that field. Not long afterward, World War II began, and he was drafted. Villchur spent five years in the army, about half of it in the Pacific. He worked in electronics and rose from private to captain.

After the war, Villchur opened a radio shop on West Fourth Street, in Manhattan’s Greenwich Village, and built custom hi-fi sets and made repairs. He also spent considerable time in the New York Public Library reading on his own, and took courses in engineering and math. He also worked as a teacher, creating and presiding over a novel course at New York University called “Reproduction of Sound.”

But Villchur longed to live in the country, and decided that becoming a writer would allow him to do so. His first editorial client was Audio Engineering magazine; when he submitted an article, editor C.J. McProud asked for a series. Saturday Review also agreed to regularly publish his work. In 1952, Villchur and his wife, Rosemary, moved to Woodstock, New York, which had long been a haven for creative people. They still live in that Catskill Mountains town.

Villchur, whose friends call him Eddie, is now a youthful 87. Stereophile readers tend to know him for having developed the acoustic-suspension woofer and dome tweeter, and as a founder of Acoustic Research. Some also remember his many magazine articles and his two authoritative books on high fidelity. [His 1965 book, Reproduction of Sound in High-Fidelity & Stereo Phonographs, is available as a Dover reprint.—Ed]

Others recognize a separate set of achievements. After selling AR in 1967, Villchur founded and funded a nonprofit laboratory, the Foundation for Hearing Aid Research, and went on to develop a prototype device whose basic design is used widely in today's hearing aids. He also wrote some two dozen papers relating to audiology and, in 2000, published a book on the subject, Audiosense for Audiologists.

Lander: What did you use for the acoustic-suspension woofer itself?

Villchur: A cannibalized Western Electric 12". I cut away the entire rim suspension and replaced it with mattress ticking. Then I cut away part of the spider. The whole thing had a very floppy mounting. I left just enough stiffness in the suspension to center the voice coil.

Lander: What did you do once you realized what you'd wrought?

Villchur: My measurements showed that my little prototype had better bass and less distortion than anything on the market, yet it was one quarter the size. I thought, This has got to be the future of loudspeakers. But the last thing in the world I wanted to do was turn it into a product. For me to be a corporate president is anathema. So, I thought, I'd sell it to a loudspeaker manufacturer. I made up my mind to ask $10,000...
The Smithsonian Institution's exhibit on the history of hi-fi featuring an acoustic-suspension woofer and the first dome tweeters.

and, if they offered me $5000, to take it. I called somebody I knew at Altec and told him what I had, and he said, "You know, Ed, we have a pretty good staff of engineers here. If there were something around such as you describe, I think they would have found it."

LANDER: You've also said that a friend of yours approached Rudy Bozak, and he turned it down.

VILLCHUR: My friend asked why, and Bozak said, "Because what you describe is impossible."

LANDER: Enter Henry Kloss, who was in the army, stationed in New Jersey, taking your NYU class.

VILLCHUR: I had hinted to my class what I was doing, and Henry started acting like a terrier. He wanted to know about it. At first I said, "Look, this has got to be done by a major speaker manufacturer," but when I saw what the manufacturers' attitude was, I said, "Well, okay, let's talk about it." So one night in the spring of 1954, after class, we got into my 1938 Buick and went to Woodstock. I explained it to him in the car on the way, which was no problem because Henry worked from fundamental principles of physics. We must have got in sometime after 11. He heard it, and right then and there suggested we use his loft in Cambridge [Massachusetts], where he was building cabinets for Baruch-Lang speakers, to make it.

LANDER: You agreed and, in effect, the two of you started AR on the spot.

VILLCHUR: Yes. On the basis of my working speaker, with my patent application already in Washington, we started AR. I wanted to pick a manufacturer we could rely on for the woofer and tell him how to make the new-type suspension, but Henry said, "No, I'll do the whole thing." He educated himself to make a woofer from scratch.

LANDER: The AR-1 was a two-way system. Where did the other driver come from?

VILLCHUR: It was made by Western Electric, their 755A, and later by Altec.

LANDER: You've given Henry credit for 75% of the production design on the AR-1.

VILLCHUR: The production design. That's accurate.

LANDER: You unveiled the AR-1 to the public at the New York Audio Fair in the fall of 1954. As it happened, an article by you describing it had just come out in Audio magazine, which was the name Audio Engineering had adopted a few months earlier.

VILLCHUR: By that time, we had three or four made. At the show, some people were bowled over. Other people were skeptical. One guy who was an engineer said, "It violated every principle I learned about speakers, and then I went home and read your article." And he put his finger to his head as though it were a pistol and said, "Of course."

LANDER: When did you begin delivering the AR-1?

VILLCHUR: March '55. We started to ship 15 or 20 a month. Maybe fewer in the very beginning. In 1955, we shipped 455 speakers. I remember that number because it happens to be an IF frequency from my old shop days. About half were AR-1s and half were 1Ws.

"ONE GUY WHO WAS AN ENGINEER SAID, 'IT VIOLATED EVERY PRINCIPLE I LEARNED ABOUT SPEAKERS, AND THEN I WENT HOME AND READ YOUR ARTICLE.' AND HE PUT HIS FINGER TO HIS HEAD AS THOUGH IT WERE A PISTOL AND SAID, 'OF COURSE.'"

—ED VILLCHUR

Stereophile, January 2005
it's coming...
LANDER: The AR-1W was a woofer-only unit. Arthur Janszert used to demonstrate his electrostatic tweeter in combination with it.

VILLCHUR: Henry knew him, and we went to his house, and Arthur compared the AR with a giant, four-woofer Bozak. His decision was just as quick as Henry's. It was an obvious decision. How many people were going to buy this giant thing when they could buy his tweeter with an AR?

LANDER: At that point, Henry Kloss was in charge of the AR factory. What did the two partners he had brought in to help capitalize the company do? Were Tony Hofmann and Malcolm Low active? And what were you doing?

VILLCHUR: Tony, a distinguished physicist, was keeping the books, and he did a beautiful analysis of the relation between speaker elements. Malcolm wasn't really active at first. I started paying a lot of attention to writing articles and talking to people who would write articles. At the 1955 Audio Fair, we had about six magazines on display, each with a whole article on the AR speaker.

LANDER: After about a year and a half, Kloss, Low, and Hofmann sold their AR shares to you. Was there friction?

VILLCHUR: There was friction. Henry really needed to have his own company; you can't have two presidents. Part of the agreement was that, whatever company they formed—which was, of course, KLH—they could take a license from us that would allow them to produce acoustic-suspension speakers. I took over production at that point. Henry left an AR-2 that wasn't ready, and a lot of work still had to be done. Then we hired somebody for production who could have been a good slave overseer for the Egyptian Pharaohs. That's when I called in people I knew.

LANDER: Right. You enlisted Abe Hoffman, a CPA, for the position of vice president and treasurer. He became AR's president after you sold the company to Teledyne in 1967, and he later teamed up with your former plant manager, Roy Allison, to form Allison Acoustics. Harry Rubinstein, a music teacher who had studied mechanical engineering and had managed a small factory during World War II, came in to run the plant. You also brought in a sales manager and a materials manager. These were people you knew and could trust. They freed you to spend your time doing what you did best.

VILLCHUR: Exactly. I did the technical correspondence at that time, and I did all the advertising with an old friend, Seymour Einwouiner, who was in an art class at City College with me. I would send him the ad copy and photographs if I had any or an indication of what I wanted drawn, and he would send me back layouts. I believe these ads gave AR a distinctive image.

LANDER: Do you think using an attorney at the time you applied for your patent would have prevented the ruling against you?

VILLCHUR: Yes. He would have had a thorough patent search made. If I had been aware of the Olson patent beforehand, it would have been easy to protect my patent, which was quite different. But sufficient protection wasn't written in because I hadn't had an adequate patent search made. Again, a matter of money.

LANDER: What did the Olson patent actually describe?

VILLCHUR: The central feature was a compliant-mechanical-rim suspension design. There was no general claim for a system that had a speaker mechanism with a free-air resonance frequency substantially below its optimum operating resonance, and which therefore required a small enclosure. That's what an acoustic-suspension system is, but the judge,

“The AR-3 was the first speaker to use the dome tweeter, which wasn't imitated in other speaker systems for about 10 years.”

—ED VILLCHUR

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who was totally nontechnical, ruled against us. I guess I feel vindicated by the fact that the Smithsonian Institution, in its exhibit on the history of technology, shows two speakers: a bass-reflex unit and the AR-3.

LANDER: When asked why you chose not to appeal the ruling, you've cited the example of Edwin Armstrong, who invented the superheterodyne circuit and FM radio.

VILLCHUR: He spent his life in litigation. I figured, "Why waste my time? I have better things to do."

LANDER: One of them was promoting AR, and one way you did that was with live-vs-recorded music demonstrations. Audiences at those events got to compare a live string quartet with recordings of the same musicians playing the same pieces.

VILLCHUR: We did them all over the place. We did one at Carnegie Recital Hall. The Washington Post gave us half a page when we rented a hall and did it there. We got tremendous publicity. Then we opened up the Music Room in Grand Central.

LANDER: That was an offshoot of a display established by Milton Sleeper, a founder of High Fidelity. It was in New York City's Grand Central Terminal, where the traffic is unbelievable and a lot of people have nothing to do while waiting for trains.

VILLCHUR: We bought it from him and revamped it so that it looked entirely different and, most important, sounded good. One year we counted a hundred thousand visitors.

LANDER: You also maintained a similar facility in Cambridge, Massachusetts. And you had a demo room at the 1963 World's Fair, in New York. AR speakers were never sold in those places, but they must have done a lot for sales.

VILLCHUR: Stereo Review used to do an annual survey [of market share by component category]. In the late '50s, we became number one in speakers, and our share increased and increased.

LANDER: In 1966, the year before you sold the company, Stereo Review put AR's share at just over 32% of the speaker market.

VILLCHUR: And number two would have been 10 or 12%.

LANDER: Along with innovative speakers, which you backed with blue-chip warranty service, the textbook-quality ads you wrote, and ingenious promotion, your unique style of running a company had to be a factor in your success. For one thing, you gave your employees substantial benefits. Tell us about that.

VILLCHUR: We had medical insurance for everybody, unheard of in the late '50s, especially for a company our size. And we had profit sharing, which is meaningful only when wages are up to scale or better. We had twice-yearly meetings at which I'd announce what the profit sharing was. The highest figure was 21% of earnings for half a year. That was for the ordinary Joe; foremen and top management got more. While it's what I believed in, it really is very good business, because the employees know that the better the quality of their work, the more their bonuses will be. We also made it clear to them that when something comes back because it fails, it takes far more out of the profit-sharing kitty than it ever contributed. Profit sharing stimulated efficient but careful work.

LANDER: Tell us about the genesis of the legendary AR turntable, which Roy told me was your baby.

VILLCHUR: I wanted to make a complete system, and I thought the next thing should be a turntable, because our forte was mechanical rather than electronic. I hired a consultant for the job, but about a year and a half and maybe $25,000 later, what he had was useless. So I had to do it, and I did almost all of it in my lab in Woodstock in the late '50s and early '60s, just after the AR-3. We thought we could bring it out at $58, but that was an error. Not too long afterward, we had to raise it to $78—complete, with everything but a cartridge. By that time, we had a reputation. When we announced we were bringing out a turntable, we had orders for thousands.

When I brought the prototype in from Woodstock, Abe said to me, "How many of these are we going to sell?" And I said, "How should I know?" He said, "Well, you have to make an estimate, because I have to know what to invest in tooling." So I said, "Okay, I'll be optimistic. I believe in this thing. It's a superior device. We're going to sell 50,000 of them before we're through." About 10 years after that—I was long gone from AR, and I was talking to Roy—I asked, "How's the turntable doing?" He said, "It's doing okay. We'll sell maybe 50,000 this year."

LANDER: However long gone you may be from AR, you maintain strong views about hi-fi. In fact, you initially balked at doing this interview because you feel that many aspects of high-end audio, such as expensive cables and equipment break-in, are meaningless.

VILLCHUR: The concluding paragraph of a talk I once gave at an Acoustical Society meeting sums that up. I'll read you part of it: "Scientific method allows investigators to form hypotheses in any way they please: out of a cold assembly of facts, intuition, or a drunken stupor... Once a hypothesis is proposed, however, it must be demonstrated rigorously. The audio discipline needs to be brought back to the world of reason."

LANDER: Is there room in that world for subjectivity?

VILLCHUR: Objective measurements in audio are primary, but they're useless unless they've been subjectively validated as predictors of musical accuracy. The validation method we used at Acoustic Research was the live-vs-recorded, or simulated live-vs-recorded, comparison. The standard I use today is set by our Woodstock chamber music concerts.
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Before other people paid attention to the phenomenon, Roy Allison noticed that loudspeaker measurements taken in conventional home living rooms typically revealed a dip in power response in the 100–300Hz range. That was in the late 1960s, when Allison was VP for engineering and manufacturing at Acoustic Research. In 1972, after designing or supervising the design of nine models at AR, he left to begin an investigation of real-room speaker behavior. Next he teamed up with former AR president Abe Hoffman and two other colleagues from that company, Sumner Bennett and Frank Callahan, who had worked in sales and quality control, respectively. The quartet founded Allison Acoustics to build loudspeakers expressly designed to perform optimally where speakers were generally placed: in the home. The first of them, the Allison Model One, appeared exactly 30 years ago, at the end of 1974. Though the firm curtailed operations about 10 years ago, versions of three original Allison designs are now available from a reincarnated Allison Acoustics, which was later re-formed under new ownership.

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ALLISON: On a break from school, I brought my car into Great Barrington [in western Massachusetts], where we were living with Nancy's folks, to have the oil changed. I wandered into a drug store on Main Street and saw these two fellows sitting at the counter having coffee. It was Milton Sleeper and Charles Fowler, and I overheard them talking about needing a draftsman to draw circuit diagrams. I had taken drafting, so I offered my services. That was in 1949.

Radio Communications barely eked out a living for them. Once in a while, we would run an audio article, and that's when the magazine would make money.

LANDER: So Sleeper and Fowler, who at the time were co-owners of Radio Communications, started a new magazine called High Fidelity. And you, having edged into editing and writing, became one of its—and the hi-fi industry's—first reviewers. Tell us about that.

ALLISON: Radio Communications ceased publication, and I joined High Fidelity. Fowler had done subjective testing for the magazine, but I wasn't satisfied with that. We started building and reviewing kits, which were big then, and measuring them. I gradually built up test equipment for making some basic measurements. We didn't really test speakers because they were unknown territory at the time.

LANDER: What equipment did you own back then?

ALLISON: The woofers of choice then were Bozaks. I had four in this huge enclosure stuffed with fiberglass. It was 10' long and nearly spanned my living room. It had to be big because these were not acoustic-suspension woofers; put four Bozaks in a small enclosure and you almost had tweeters. On each end of this box was a Janszen four-panel electrostatic tweeter.

LANDER: And the associated equipment?

ALLISON: At that time it would have been an UltraLinear amplifier from Dyna; UltraLinear was a circuit design. I think the preamp was a Heathkit. And a Minter turntable—string drive. The string was slightly elastic. Wow and flutter were actually very good because the turntable weighed about 25 lbs. I was probably using a Fairchild arm and a Fairchild cartridge.

LANDER: In 1959, you moved to the manufacturing sector as assistant to the president of Acoustic Research, Edgar Villchur, and for a time supervised customer service. Tell us about that assignment.

ALLISON: We had an extremely liberal policy. Even after the warranty period, it was almost impossible to pay for a repair unless there was blatant abuse, and even then we very often fixed the speaker at no charge. Some customers actually sent gifts—a crate of oranges, for example, from people down here [in Florida, where Allison and his wife now live]. We got that more than once. Customers then were mostly professionals—doctors, lawyers—anywhere from age 30 on up. College kids were brought into the fold with the AR-4 in the early '60s, and with the less expensive speakers that followed.

LANDER: In 1967, when building conglomerates was the rage, Teledyne added AR to its portfolio of companies. Ed Villchur left at that point, but you got a five-year contract and, along with other senior managers, stayed on.

ALLISON: To Eddie's credit, he insisted on very generous contracts for all of us.

LANDER: You've said he would spend about three days each week in Cambridge, Massachusetts, where the company was located, but his home was in Woodstock, New York, a haven for artists. Does that hint at his management style?

ALLISON: Almost every day that he was in Cambridge, after the workday was over, we went into Eddie's office and had a conference, which consisted mainly of eating macadamia nuts and drinking Johnnie Walker scotch.

LANDER: Red or Black label? [laughter]

ALLISON: Black. There was a liquor locker with all kinds of alcoholic beverages available for the senior executives, including fine wines like Château Lafite. We all had company cars—Chevrolets. We didn't even have to buy gasoline; we had a caretaker who checked the cars and filled them with gas.

LANDER: A manager could justify all that by saying it kept you at work longer.

ALLISON: Actually, some useful discussions occurred over the little jiggers of Johnnie Walker Black.

LANDER: I'm sure the corporate overseers from Teledyne employed different management techniques. How did they behave?

ALLISON: We had a relatively eventful five years under Teledyne, but they bedeviled Abe Hoffman, who had been financial vice president and became president after Eddie left. They insisted on very detailed financial reports, which of course we provided. They insisted on profit plans, which Abe said was like telling fortunes. We did electronics—first an amplifier and then a receiver—and several more speaker models. All the speakers, with the exception of the AR-5, were phenomenally successful.

LANDER: The legendary AR turntable remained in the line, of course.

ALLISON: The turntable provided a big profit. I don't know how many hundreds of thousands sold. That was Eddie's concept. What I did was help in production engineering.

LANDER: In 1966, Stereo Review's annual market survey indicated that AR had just under a third of the speaker market locked up. What happened between 1967 and 1972, when you left?

ALLISON: In those five years we doubled sales and doubled...
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profits, but our market share was dropping because the market was expanding. It was sort of like a pyramid, with very low-end stuff building out at the base, but it was building upward, too. Medium and high-end stuff was where the profit could be achieved; a lot of low-end people were flashes in the pan and went out of business after a while. But at the end of five years, Teledyne decided they wanted to exploit that lower end more than we were doing, and they didn't renew Abe's contract. They brought in a president who was very personable but who was totally unfamiliar with the quality speaker market.

**LANDER:** Did they offer to renew your contract?

**ALLISON:** Yes, but not on the same terms. They were going to take away some of my salary and my responsibility for manufacturing. I decided to leave.

**LANDER:** Had you and Abe discussed forming your own company, Allison Acoustics?

**ALLISON:** No. He was going to retire. I took time off, but I didn't just put my feet up; I decided to find out what was going on with loudspeakers and room interaction. I'd had a hint of it while doing some papers at AR. There was an unexplained phenomenon—nobody could tell me why it happened: a suckout in the middle bass range in almost every loudspeaker, almost every room transmission curve that we measured. That got my curiosity aroused. I wanted to find out what was causing it.

**LANDER:** The same speakers measured flat in an anechoic environment, did they not?

**ALLISON:** Yes. It was the goal at the time, but when you put them in real rooms, they were not flat at the low end.

**LANDER:** How did you begin your investigation?

**ALLISON:** I bought Brüel & Kjaer test equipment, which cost the earth, and I set about measuring loudspeakers under varying conditions and doing research to see if there had been any literature about this. It turns out there had been. I came across Waterhouse and Cook's original papers. They were scientists at the National Bureau of Standards, and they had done a lot of experiments in a huge reverberant chamber. They varied the distance of a small test loudspeaker to walls in that chamber and recorded the reverberant energy. They didn't extend their work to the use of loudspeakers in homes, but they did quantify the effect of reflections from room boundaries and developed some very elegant formulas for predicting that effect.

**LANDER:** Were other people concerned with room reflections at that time?

**ALLISON:** Not that I know of. Everybody knew about standing waves, which tended to muddy the water and make these other effects very difficult to see. I did a great deal of empirical testing of my own and racked my brain, trying to figure out how to avoid this problem—and it was indeed a problem. Reflections from room surfaces can increase or decrease the power output of a woofer. Reflected energy increases the instantaneous density of the air in front of the woofer at very low frequencies. This provides an improved impedance match, and the efficiency of the woofer is thereby increased, along with the woofer's power output. At some higher frequency that depends on the distance or distances from the room surface or surfaces, the reflected energy goes out of phase with the woofer cone motion. That decreases the instantaneous density, and the woofer efficiency decreases. That's what causes the dip.

Now if the woofer is fairly close to one room surface and distant from others, in most home listening systems, power output in the range between 100 and 300Hz will drop about 1dB below what it would be without the nearby reflecting surface. At very low frequencies, there would be a 3dB increase in power output. That means, given maximum increase and maximum decrease, there's a total variation of 4dB. With the woofer equidistant from two intersecting surfaces, the dip is 3dB; factor in the maximum rise, in this case 6dB, and you have a 9dB variation. If it's equidistant from three surfaces that intersect at right angles, the dip would be a devastating 11dB and the maximum rise 9dB—a 20dB change over the bottom octaves. If the woofer is not on the line of symmetry, which is to say the same distance from all three surfaces, the dip is less severe but can still be significant. In home listening situations, I've found this reflected impedance typically causes variations from 5 to 12dB. If a tuner or receiver exhibited variations like this, it would be rejected out of hand.

**LANDER:** You hold a patent relating to this boundary-effects phenomenon. What does it cover?

**ALLISON:** The design of cabinets that get the woofer very close to one or more adjacent room surfaces. That changes the frequency range of the dip, because the closer the woofer is to a surface or to the point where surfaces intersect, the higher in frequency the dip occurs. In the case of a three-way system, it's possible to position the woofer so the dip is above its operating range, and to place the midrange driver far enough away from an intersection for the dip to occur below its range. In effect, that eliminates the problem. This approach really isn't feasible with two-way systems, because the woofer has to handle frequencies high enough...
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to put the destructive reflections within its range. But you can build a cabinet that has the woofer very close to one surface—the best place is on top—and then position that cabinet so distances to the other nearby room surfaces are staggered. Doing that creates mild dips that are spaced along the frequency axis. They aren’t able to add in the nonlinear manner that they would if the distances between the woofer and all adjacent room surfaces were equal.

LANDER: You then applied all this to speakers meant for very specific room placement. The first, the floorstanding Allison Model One, which had a pair of 10" woofers in each cabinet, and the Model Two, a smaller version that used 8" woofers, were both designed to be backed up to walls away from corners. The floorstanding Model Three needs corner placement to compensate for the dip. Model Four was a bookshelf unit, and there were other models as well. You also designed the midranges and tweeters that your speakers used.

ALLISON: Developing midrange and tweeter systems that were high enough in quality to complement the woofer we anticipated making was much more difficult. I worked out a configuration that I thought would produce extremely wide dispersion, which I deemed essential. I always wanted maximum dispersion of energy at all frequencies, and preferably the same amount of energy at all frequencies, and I set about to get it. That resulted in what was then a unique design for a tweeter-and-midrange configuration: what is essentially half a pulsating sphere. When you make it flexible—from paper—and clamp the outer edge to the mounting plate, then drive it at the midway point, the surface of this driver is going to be forced to change its radius of curvature so that there’s a relatively large component of motion at right angles to the voice-coil as well as in line with the voice-coil motion.

LANDER: And this gave you the dispersion you were after. Do you still favor paper cones?

ALLISON: Yes, I do. Not for a woofer, where the material doesn’t matter very much as long as it works like a piston. At the other end of the spectrum, I don’t want it to work like a piston, because even a small tweeter, if it’s big enough to produce any reasonable amount of energy, is going to become directional at very high frequencies. So I have to use a very flexible material, and paper has a nice ratio of stiffness to sound-energy absorption when it flexes. With the right configuration and density and stiffness, paper can behave in a unique way. It’s aided in my design by the material used to clamp the outer edge to the mounting plate—a very thin layer of foam, which is pretty effective in absorbing any energy that wants to reflect back from the edge and cause nonuniform response.

LANDER: You began corresponding with the speaker expert Dick Small when he was working on his PhD thesis in Australia, and maintained that relationship. In fact, you played the first pair of production Model Ones for him. Tell us that story.

ALLISON: He and his colleague Neville Thiele were making a speaking tour of the United States and had dinner with Nancy and me and our children. So after dinner we sat them down and played some music for them on Model Ones. Their response was very polite but unenthusiastic. It turned out that they were used to hearing speakers, characteristic of the Commonwealth, that had very pre-

“**I ALWAYS WANTED MAXIMUM DISPERSION OF ENERGY AT ALL FREQUENCIES, AND PREFERABLY THE SAME AMOUNT OF ENERGY AT ALL FREQUENCIES.**”

—ROY ALLISON

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“**I DON’T WANT TO PUT UP WITH A SWEET SPOT, AND I’D RATHER HAVE LESS DRAMATICALLY PRECISE IMAGING WITH A CLOSE SIMULATION OF WHAT YOU HEAR IN A CONCERT HALL IN TERMS OF ENVELOPMENT.**”

—ROY ALLISON

sales picked up gradually, but we weren’t growing as fast as I thought we should have to become really viable in the long run. Our overseas sales, mostly in France and Italy, accounted for little more than half our total. Then we had a recession, and it really hurt Europe badly. That’s when our slide downhill started.

LANDER: It’s easy to be nostalgic about the past, but music seems to have meant much more to people as enthusiastic as they were about the concept. I had emphasized dispersion in order to re-create as best I could the performance-hall ambiance. I don’t want to put up with a sweet spot, and I’d rather have less dramatically precise imaging with a close simulation of what you hear in a concert hall in terms of envelopment. For that, you need reverberant energy broadcast at very wide angles from the loudspeakers, so the bulk of the energy has a chance to do multiple reflections before it reaches your ear. I think pinpoint imaging has to do with synthetically generated music, not acoustic music—except perhaps for a solo instrument or a solo voice, where you might want fairly sharp localization. For envelopment, you need widespread energy generation.

LANDER: That could explain why your Allison Acoustics speakers met with what you admit was a mixed response. You’ve also speculated that their appearance, which I’ve always liked, put some people off.

ALLISON: They looked unusual. People didn’t expect speakers to look like that, and unconventional things can create suspicion.

LANDER: Nevertheless, your volume did become substantial—and that was a time when new speaker companies kept popping up like weeds. At one point, though, sales began to drop off.

ALLISON: Sales picked up gradually, but we weren’t growing as fast as I thought we should have to become really viable in the long run. Our overseas sales, mostly in France and Italy, accounted for a little more than half our total. Then we had a recession, and it really hurt Europe badly. That’s when our slide downhill started.

LANDER: It’s easy to be nostalgic about the past, but music seems to have meant much more to people back in your AR years and in the early years of Allison Acoustics.

ALLISON: Actually, it was a glorious time.
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"I'm a painter and a fisherman and that's what I'm doing with guitar. I'm really concerned with falling and not knowing where I'm going and not knowing what's next because I think in that moment is truth. As an artist and in my process, that's the only thing I'm concerned with."

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The guitar has as many variations as there are sets of hands to play it.

Recently, a spate of outstanding and less-than-mainstream records by sidemen turned solo artists has been released. Moris Tepper, James Blood Ulmer, and Buddy Miller (quoted respectively above) have all made albums that stretch the guitar's possibilities. All three are also old pros, the kind of instrumentalists who've spent a lifetime working on — Miles Davis leaps to mind here — a tone and style that's all their own. Yet as the quotes above show, each has a unique vision. Their albums' all being released at nearly the same time provides an interesting cross section of contemporary guitarists whose quirks factor is high and who are making challenging, individual music as 2004.

MONSTERS

Of the three, the most well-traveled and well-spoken (possibly too much so) is Jeff Moris Tepper. As a sideman, Tepper (he's dropped the Jeff) has built an impressive résumé, beginning with the four albums he recorded as part of the last version of the Magic Band that Don Van Vliet (Captain Beefheart) assembled in 1978. Tepper was there in time for Van Vliet's last great masterpiece, 1978's Shiny Beast (Bat Chain Puller). After Beefheart retired in 1982, Tepper played and recorded with ex-Pixie Frank Black (five solo albums), Tom Waits (Frank's Wild Years) and Robyn Hitchcock (Moss Elks). Most recently he's been touring as the opening act for PJ Harvey.

In recent years Tepper has also begun to release solo albums, the latest of which, Head Off, was released in 2004 on his own Candlebone label. Recorded with a trio, the album varies from the harmonica-and-acoustic-guitar near-folk of the title tune to the eerily Townes Van Zandt-like "Mrs. Bodeen" to the loud, alternative power-trio rumblings of "1,000 Eyes," which its author says is about flies. Despite the fact that he's fallen under the spell of adding effects to many of his vocals — almost always a mistake, in my experience — Tepper has what the L.A. Weekly calls a "soul-man voice." His guitar playing varies from crushing and loud to loopy, but Tepper is more concerned with adding structure than taking off on solos, which he calls "an antiquated form" that he occasionally finds "embarrassing" but which, he admits, are "complicated gems beyond anything that can be learned because they came out in a twisting death throes. There's just so many elements to them that happen as your neurons are firing that can't be repeated, at least not with that same murderous force."

While his résumé might impress hard-core music fans, Tepper's many miles didn't count for much when it came to paying the rent. Not so long ago, he nearly lost heart. "I quit, I just stopped, because I was plagued by the disappointment of feeling like I'd done so much work on my own, and wasn't getting financial reward to compensate for it. I moved, quit, broke up the band. I'd gone from a spirit that was trying to fit into a commercial sense to one who wasn't even living in that world. Then, eight months later, I couldn't help from wanting to run in and record these little weird things."

Eventually, Tepper turned 24 of those little weird things into an album, Moth to Mouth. "I've done this now for enough years, I'm no longer a pop guy trying to make a pop record, or an alternative guy trying to make an alternative record. I am now an old goat who's walking up a mountain, and at this point even the dummies look at it and go, 'What the fuck? He's about to fall and kill himself.' Lately though, there's that energy when one animal comes desperately seeking another, the other one is out of there. When one doesn't need another, then all of a sudden it's quite attractive."

It was during the tour following Moth to Mouth that Tepper began hearing the sound he wanted for his next project, the sessions that would become Head Off: "I heard a sound on these stages that wasn't the same as Moth to Mouth. It was a band, a small band, and it was a fury. I started feeling like this should be trapped, but I didn't want to make a live album. I want to strip it down and make it bloody. That was the force to make Head Off."

Of the album's 12 tunes, Tepper wrote all but three, two of them collaborative efforts by himself and his trio of Dave Burk (drums) and Scott Mathers (bass and keyboards), the last, "Ricochet Man," cowritten with his old mentor, Don Van Vliet. "I had a tune that I was playing, it was an instrumental track called "I Want My Mom." [laughs] Don and I talk every week, and he's hearing the tracks going down, and he says, 'I love the record, but what about this one?' I said, 'I don't know about that one.' So I told Don the story, and he said, 'Oh, how's that guy doing?' I said, 'I don't know whether you know this or not, but he's been in jail for like three years for shooting a gun off in his apartment and there wasn't anybody there.' He goes [in a hipster whispered], 'Man, Ricochet Man.' "I don't think I've had a conversation with him in 20 years that he hasn't written at least one, if not 18, songs while we're on the phone. He's constantly going. He doesn't care if you're on the phone or not, he's just going.

"Since he quit music, but more important the last four or five years, he's really gotten sweet and nurturing, and sup-
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It's saying 'Use this' all the time to me, but I'm trying to make my own work, my own statements. But I was like, "Hey, let's slip one of these in," and it felt so appropriate, so right for the record. So we got one together."

Like Beefheart, Tepper has always been a painter as well as a musician (all his art, both musical and visual, can be heard, seen, and purchased at www.candlebone.com). He's now trying to split his time between songwriting, playing live shows, and painting. The day after we spoke, he was headed off to Canada to hole up and paint for three months. A US tour is planned for spring 2005. He's been playing shows with John Frusciante; there's also been talk of his collaborating on a project with the Red Hot Chili Peppers.

While playing with Beefheart was a life-changing experience, opening for PJ Harvey (her latest record, Uh Huh Her, was released in 2004) has been equally impactful for Tepper, so much so that she has at times gone from star to sideman, playing bass in his band. His many years of being a sideman have trained Tepper's eyes and ears when it comes to watching and learning from other musicians. In Harvey he sees several characteristics that impress him.

“One, her graciousness. It's mostly how I see her with people. For someone who's so powerful, kooky, sensitive, beautiful, weird, plagued, and all the things that great artists are, her presence, whether it's me or a stranger...she's very gracious, she's very present, to hear your story, to help you, to politely carry the moment through together. I'm not going to say that that's Captain Beefheart. I'm not even gonna say that that's Tom Waits, who's a very sweet guy. And Frank Black, another really sweet guy. It's very different. She gives you a stage."

“As a player, I'm auditioning like five or six players, some of them are well-known — we won't talk about them — and they come in and they need some solo'd bass tracks, and even then they don't hear the notes right. She walked in with bandages on her fingers from rehearsing — she's not a bass player. She walks in and plays harder, more violently, more viciously every correct note than any seven-foot-high black man that walked in, than any little weirdo... She nailed the shit with a violence...that's my stool sample, man, that's where it lives. Her nose was bleeding, and that's not a joke. She had to run into the bathroom. And she's this little, sweet, fragile...I can't come out, I'm doing my makeup. All the other monster bass players [I auditioned] looked like toy puddles when she got out there. I'm so impressed by the fierceness of her monster.”

When it comes to sidemen learning from group leaders, few have learned more about being a musician or a person from a leader, than James Blood Ulmer, who played with saxophonist Ornette Coleman. In the course of an hour's conversation, Ulmer, well-known for his almost Lester Young brand of cosmic hipster talk, used the word “harmolodics” nearly 50 times. He pinched the term from Coleman, who invented it to describe his way of playing, in which no single element dominates, where there's often a steady beat, often in irregular meters, and in which an ensemble plays around multiple tone centers. Coleman has called it his “kaleidoscopically hybridized idiom.”

As Coleman told Michael Dorf on www.KnittingFactory.com, “One day, I said to the piano player, ‘You know what, it seems to me that when you play the piano that it's telling you which way to go and when to stop and when to start. But when you play by yourself you don't have this problem. The structure of music is like grammar, it's an invention that you have to follow.' But then I realized that's not true of sound. There's no form of sound. The same thing I'm talking about now — harmolodics — I knew then, but I didn't know how to express it. Because I was only trying to show the musician that was playing bebop there was another way of playing music without it conforming to a style.”

That last notion of not conforming to a style fairly describes Ulmer's legacy and future in music. Musically, he's always worked in a blues-jazz-funk netherworld where he can't be labeled by any one genre. Ulmer maintains that he's also taken Coleman's principles one step further and applied them to his entire life.

“The concept is harmolodic. It doesn't have that much to do with the playing. The music concept has happily created harmolodic people. My way is harmolodic; a harmolodic view of how you do everything. You're not in one place with anything; it's a self-existing thing to be a harmolodic person,” he says, sitting at a long table in his SoHo loft.
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Stereophile, January 2005
"That's why I think people can still say to me, no matter whether I'm singing the blues, or playing jazz, or whatever I'm doing, it's coming from Coleman — not particularly the music necessarily, but the attitude and the style. Being what you're doing, you have to live what you're doing.

"I don't know if Coleman thinks of himself as a harmolodic person or not. I know he thinks he plays harmolodic music. Just music necessarily, but the attitude and the style. Being what Blue Note, and DIW, for whom man and leader, is varied and becoming increasingly essential. The harmolodic maker — he made the piano but he don't have to be a player" to be responsible for the concept is enough. It's like the piano while most of his records are live sets released on obscure Italian labels.

In his solo career, Ulmer has recorded for a bushel of labels, including CBS, Rough Trade, Blue Note, and DIW, for whom he recorded 14 albums between 1986 and 1997, with players like Sam Rivers and David Murray. While most of his records are worth having if only for his ideas and recognizable tone, the two highlights of his discography are 1978's Tales of Captain Black (Artists House) and 1983's Odyssey (CBS).

Ulmer's latest projects are Blues & Grass, a live album he recorded for Chesky Records with a new pickup band he's tagged The 52nd Street Blues Project, and a forthcoming, as yet unnamed solo project for Hyena Records. Like his last two highly acclaimed Hyena albums, Memphic Blood: The Sun Sessions (2002) and No Escape from the Blues: The Electric Lady Sessions (which Rolling Stone named one of the 50 best albums of 2003), the new one will be produced by Vernon Reid. It was slated to be recorded in November for a spring 2005 release.

When label co-owner David Chesky approached Ulmer about making a record, Ulmer says he listened politely, then said, "'You want to make an on-the-porch record.' When he ran down his concept of making a record, no mikes, no amps, I said, 'Oh my, that's like being on the back porch. I think I can help you produce a record like that.'"

The resulting album is blues a la Blood, meaning it's as far from the usual 2004 blues record as you can get. Part of that comes from Ulmer's refusal to fall into any pat definition of anything, and part of it comes from his bizarre guitar tunings and the fluttering, almost plucking style he employs throughout the sessions. Then there's the songwriting, all of it modern, blues-based tunes: six by Ulmer, two by singer Queen Esther (whose oversinging, unpleasant yowling and inability to sing using a microphone mar several numbers), and two by Ulmer's longtime friend and musical collaborator, violinist Charlie Burnham. The interplay of Burnham's and Ulmer's instruments is easily the best reason to listen to Blues & Grass.

"He's the first violin player I ever played with, and the only one. When I first started playing with the tuning that I call the harmolodic unison tuning, the way I'm tuned is exactly like a harmonica. The violin tuning is on top. "He's a harmolodic player, that's all I can say. Whatever you play, he's gonna play the violin on top of it. It won't stop him. He acts just like that was some shit he was playing yesterday," Ulmer says, laughing and burying his head in his hands. "But that's what you need. If I start singing, he goes on [mimics playing violin], he don't give a shit [laughs]. If it's a song of promise, he does this [more sawing], I just got with the right brother. You can't even look for a brother like that, because right then he'd be like, 'What is it?' [rapping his knuckles on the table] Or how much is it? [more laughter] I can't even think past Charlie."

As on his last two records for Hyena, Ulmer on Blues & Grass has delved into the blues, trying in the process to vitalize the musical form and claim his rightful place in a music that's rapidly becoming a museum piece. Harmolodic person that he is, Ulmer, a Baptist preacher's son who grew up in South Carolina, knows why the blues may or may not be in trouble.

"Blues is really a concept. The concept of it is very alive. It's just like jazz; the concept of jazz is so alive. But people tell parts of themselves that hurts the concept. They make the blues look bad.

"First, blues to me was something you could play in church, and somehow or another they started playing the kind of music that you would not be able to play in no Baptist church in South Carolina. I want to take some of the gutbucket out of it. I'm going to take my music back to the church, where the blues was misunderstood. The misunderstood part about it to me was when they thought it was a music. Blues is just a concept to me, and not a music. You don't have to think about your girl in the graveyard, dying, and you're poor and you ain't got no shoes and no coffee — that's you. That's not the concept of blues, that's just your story. It wasn't personal.

"People have made music personal. They don't even go to a concert if they don't personally like the music they're going to see. I'm going to hear this 'cause I really like this music.' Now, that's a hell of a reason to go to music. It's supposed to be art. Someone supposed to be going to hear something to be enlightened. It's not harmolodic.

BOATWORK

While Blood Ulmer may be endeavoring to be a harmolodic person, none of these guitarists has more at stake spiritually these days than Buddy Miller. A sideman to Steve Earle and Emmylou Harris, among others, Miller has also made a string of great solo records, as well as two collaborations with his singer-songwriter wife, Julie Miller. One of them, the pair's self-titled debut, is a stone classic. Miller also produces records, most notably Jimmie Dale Gilmore's One Endless Night (2000). With his new record, Universal United House of Prayer, Miller has taken the brave step of embracing his Baptist church in South Carolina. He just wants to take some of the gutbucket out of it. He's the first violin player I ever played with, and the only one. When I first started playing with the tuning that I call the harmolodic unison tuning, the way I'm tuned is exactly like a harmonica. The violin tuning is on top.

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"It's a kind of natural reflex action, I guess," Miller says with a laugh from his home in Nashville, "but I wanted to make a record that was a little deeper, a little offbeat."

On deeper examination, House of Prayer is more a record about Miller's feeling that the world is on shaky ground — kind of a "Buddy's worried" record.

"I knew I wanted to do something different the week I was done with the record before. I thought I wanted to do something that had some spiritual leanings, and it's hard to
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ignore what’s going on, the whole state of the world. Also, Julie’s brother died about a year ago. It’s a long story, but he was struck by lightning in the same spot where he had had a crippling dirt-bike accident when he was a teenager. Back then he was called ‘the miracle kid’ on the front page of the Waco paper. All this kind of left me with the feeling that there were dots to connect. So I wanted to make a record that looked at big picture, little picture.”

Miller is a triple threat, and House of Prayer reflects that. He sings on it better than he ever has, and although the self-effacing Miller says he doesn’t consider himself a hot guitarist, his genius on the strings lies in creating textures and layers. “The Tremolo never goes off,” he says matter-of-factly. It’s no stretch to say that, without the guitar layers Miller added to it, Emmylou Harris’ acclaimed Wrecking Ball album would not have been the success it was.

Finally, there are the songs, perhaps the most critical ingredient to any project to which the word “spiritual” can be appended. Several of Miller’s usual collaborators appear, including Julie Miller and Jim Lauderdale. Alternative singer-songwriter Victoria Williams (perhaps best known as the recipient of the Sweet Relief project) cowrote a song. Overall, the record is the most rhythmically vital project Miller has ever done, which offsets some of the more serious concerns voiced in the lyrics. “There’s a lot out there to be concerned, upset, and worried about, I guess, and some of the songs serve as segues between the heavy, worried songs and the hopeful, eternal songs.”

The covers on the album are a distinguished lot: “There’s a Higher Power,” by the greatest brother duo in country-music history, Charlie and Ira Louvin; Bob Dylan’s “With God On Our Side”; and “Worry Too Much,” by Mark Heard, a Christian singer-songwriter who was run out of the CCM world. “He was an artist that was rejected by that whole strange CCM scene,” Miller says of his friend, who had a heart attack onstage and died later in the hospital in 1989. “They didn’t appreciate him or get him, and he was by far the best thing that they’ll ever see.”

Miller is aware that the Christian market will most likely feel the same way about Universal United House of Prayer. “It’s probably that politically it doesn’t line up with what they want. That’s what the problem with Mark Heard was, too. He didn’t put things in pretty little packages, and tie ‘em in a neat little bow, and talk about the three or four things that you’re supposed to sing about. My album has got enough on there to probably keep it away from everybody,” he says with a chuckle.

While Heard’s tune opens the album, it’s Miller’s cover of the great Dylan antiwar standard, “With God On Our Side,” that is House of Prayer’s centerpiece and spiritual heart. “I had no idea the Dylan song was that long. If you know it, it’s hard to get it out of your mind. It’s over 40 years old and it’s incredible. A song like that, it’s not hard to get in the middle of it when you’re singing it. It kind of takes over. It’s hard not to be moved by it.”

Miller recorded Universal United House of Prayer at his house in Nashville, where his studio is set up all over the house. Half digital and half analog, the studio is well stocked with both ribbon and old RCA mikes, both of which he used on the album. A beta tester for seven years for the program that became Protools, Miller uses a computer to record his music but still believes in tape. “You don’t have to work as hard to make it sound good.”

Unlike Tepper and Ulmer, both of whom play the usual mix of Gibsons (Ulmer), Fenders (Tepper), and more exotic makes, Miller uses only Italian-made Wandre guitars. “I got ’em 30 years ago for $50 in a pawnshop and I’ve played them at every gig ever since. They’re very unique, they’ve got their own sound, and they’re really what my hand is used to playing. They’re made of, like, Formica, plastic, and aluminum, they’re strange, they’re Italian, and they thought they were being modern. One will drop sometimes and the plastic will break and I’ll have to dump superglue in it. When I take it to the guitar repair guy in Nashville — he’s one of the premier guys in the world — he sees me coming and he just shakes his head. He works on all these fine instruments, like $20,000 ancient Martins and Gibsons, and I bring him this thing. He calls it ‘boatwork.’”

As different as all three guitarists are, they share a common trait. Whether it’s monsters, harmolodics, or boatwork, all three are, with apologies to Frank Sinatra, doing it their way: setting trends rather than following them, remaining dedicated to their visions instead of being swayed by fashion or finances. In this and every musical age that’s come before, that means everything.
Yamaha once made a loudspeaker shaped like an ear. I felt sorry for the guy (especially if he was an audiophile) who had to write the ad copy explaining why a speaker shaped like an ear would sound better than one shaped like a shoebox or a wedge of cheese. An ear-shaped loudspeaker makes about as much sense as an eyeball-shaped television. But what about a loudspeaker that is designed like a musical instrument?

When Sonus Faber’s Franco Serblin began creating his Homage series of loudspeakers to honor the great violin makers of Cremona — Amati, Guarneri, Stradivari — his design inspiration curiously turned out to be not the violin but the lute. Speakers shaped like instruments make about as much sense to me as speakers shaped like ears, but in the case of the curvaceous lute shape, the claim that fewer parallel surfaces result in fewer standing waves seemed to make sense. Whether that was Serblin’s real reason, or he just likes the lute’s looks, his designs have been extensively copied.

For his final Homage model, the $40,000/pair Stradivari Homage (named, of course, for Antonio Stradivari), Serblin’s instrumental inspiration actually was the violin. The Strad’s tall, unusually wide and shallow speaker cabinet forms a graceful, narrow ellipse. Black-lacquered concave endcaps suggest the violin shape. This is one speaker that looks equally attractive (or ugly) from all sides. Some visitors to my room found its looks odd — "like a piece of toast," said one. From a listener’s perspective, the wide front baffle is unusual — especially if you’re used to modern narrow-baffle speakers designed to reduce cabinet diffraction.

To me, the Stradivari — with stained-lacquer wood stacks, center leather-covered insert, and gently raked profile, all reminiscent of Sonus Faber’s Amati Homage — looks graceful and dramatic from all angles. Every line seems to have a purpose. As with many things unfamiliar, the more time I spent with it, the more appealing its looks became, and the more I was able to appreciate its many subtleties of design. No doubt a good part of your $40,000 goes to pay for the speaker’s looks; if you don’t like what you see, chances are you’re not buying, even if you like what you hear.

What’s the big idea?

The Stradivari is a three-way speaker with two stiff, lightweight, 12” aluminum/magnesium-cone woofers custom-built for Sonus by SEAS. These are crossed over at 300Hz to a 6” Audio Technology pulp-cone midrange driver (ScanSpeak and Dynaudio were both founded by Audio Technology founder Ejvind Skaaning), which in turn hands over the signal at 4kHz to a custom version of ScanSpeak’s silk ring-radiator tweeter. This features both a proprietary dual-toroidal waveguide designed specifically for the wide baffle, and a wooden acoustic labyrinth rear-wave damping system designed by Sonus Faber. The rear-ported woofers are tuned using the entire internal volume of the enclosure, while the tweeter and the ported midrange unit are contained in a substantially braced, cardioid (heart-shaped) subenclosure, compression-held in place by the main enclosure walls.

The main enclosure is constructed using a wood laminate, with constrictive damping inserts in between additional front-panel layers of laminate, in the style of

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1 The Guarneri Homage and Amati Homage were reviewed in July 1994 and June 1999, respectively. — Ed.
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the Amati Homage, which was built of stacks of solid maple. The interior of this enclosure, too, is strongly braced. A series of photos supplied by Sonus shows how the laminated wood is clamped in order to achieve the curved shape — clearly a time-consuming, labor-intensive process that is reflected all too faithfully in the retail price. Also like the Amati, the Stradivari Homage is painstakingly hand-stained and -lacquered, in a difficult process that Sonus Faber says that only a small number of craftsmen are capable of performing. The Strad is available in the familiar violin-like red-orange finish used on the Amati, and in a more subdued slate-gray finish. Easily the most beautifully constructed piece of loudspeaker cabinetry I have ever seen or touched, it looks dramatic and statuesque from any angle. Pictures don’t do it justice. When you (and a helper) pick it up, you can almost feel the wrapped-tight energy required to hold the structure together, as well as its solidity and physical integrity.

**Sound with no strings attached**

When I visited the Sonus Faber factory, in Arucugnano, Italy, last winter, I spent an hour listening to a pair of Stradivaris in Franco Serblin’s listening room while he conducted some business with Sumiko’s John Hunter. The room was significantly larger than mine and far more reflective, but the speakers stood in free space far from any wall. Hooked up to them were an Accuphase SACD player and a David Berning ZH270 output-transformerless tubed power amp with two inputs and a volume control. The Strads are rated at 92dB efficiency, so a 70Wpc amp should have had no trouble driving them. It did so with ease.

![Figure 1](image1.png)

**Fig. 1** Sonus Faber Stradivari Homage, electrical impedance (solid) and phase (dashed) with port open (2 ohms/vertical div.).

![Figure 2](image2.png)

**Fig. 2** Sonus Faber Stradivari Homage, nearfield responses of midrange unit (black), upper woofer (green), lower woofer (blue), and port (red), scaled in the ratio of the radiating diameters.

The drop-dead gorgeous Stradivari Homage is specified as having a very high 92dB voltage sensitivity; to Sonus Faber’s credit, my estimated figure was even higher, at 93dB(B)/2.83V/m. However, the speaker asks the partnering amplifier for a lot of current capability, its impedance (fig.1) dropping to 3 ohms and below for much of the upper bass and midrange. And the combination of 4.4 ohms impedance magnitude and –48° capacitive phase angle at 55Hz will give lesser amplifiers conniptions.

Some small discontinuities are apparent in the fig.1 traces, but unfortunately an equipment failure meant I could not investigate the cabinet’s vibrational behavior before the speaker had to be returned. However, I did listen to the surfaces with a stethoscope while I played the half-step-spaced chromatic toneburst track on Stereophile’s Editor’s Choice CD (Stereophile STPH016-2). Fairly strong resonant modes could be heard both between 125Hz and 150Hz and an octave higher than that region. I would have thought that these would add a degree of congestion to the sounds of instruments with high spectral content in the lower midrange — the cello, for example — but Michael Fremer actually thought the Stradivari excelled on this instrument. It’s possible that, while these resonances exist, they don’t couple to the air very effectively; the Sonus Faber’s high sensitivity will also help in this regard.

Franco Serblin’s designs for Sonus Faber have always featured complex behavior in the lower region of the audioband, and the Stradivari is no exception. The big port at the base of the rear loads the woofers and is tuned to a low 23Hz, according to fig.1. The small, higher port on the rear of the cabinet loads the midrange unit, but its tuning frequency is not readily apparent from this graph. The nearfield responses of the midrange unit, both woofers, and the lower port are shown in fig.2, plotted up to 1kHz. (The upper port did not seem to do much of anything, at least regarding radiated output.) The black trace in this graph shows the midrange unit’s response. It rolls off steadily below 600Hz with a second-order slope. A small inflection in the trace at 100Hz implies that this is the tuning frequency of the upper port. The two woofers behave in an almost identical manner below 300Hz, but the upper woofer (blue trace) has a notch in its output at 500Hz with then a return; the lower woofer rolls off smoothly above the crossover frequency.

The crossover frequency between the midrange unit and woofers is specified as lying at 300Hz, but fig.2 indicates that this is not strictly correct. The outputs of all four radiators are plotted in this graph according to the ratio of their diameters, which means that the com-
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Music, system, room, and speakers were all unfamiliar to me, but now that I’ve had the Strads in my room for a few months, I know I could have pretty much written the review back in Arcugnano. I spent that hour in an emotional zone, soaking in the music and sound, hardly paying "reviewer attention" at all. It’s rare that I can be so deeply under such circumstances, but I was. Had Serblin’s meeting taken another few hours, I would probably have just continued to sit there, contentedly listening. That’s what happened at home.

I set up the Stradivaris myself and found them not particularly finicky to optimize. Later, when John Hunter and Patrick Butler paid a visit to get the speakers maxed out to their satisfaction, they ended up moving them only slightly, but they also changed the rake angle using the spiked feet, which greatly improved the Strads’ already impressive overall coherence. The pair ended up close to where almost all speakers sound best in my room: a few feet from the front wall, about 8½ feet apart. I was told to leave the elastic string-type speaker grilles off for best sound, so I did. This is one speaker that deserves to be seen and appreciated uncovered.

When you’re accustomed to narrow-baffled speakers, being confronted by two wide expanses of wood can be jolting. Because the Stradivaris have more of a “room divider” presence than most moving-coil–based speakers, they affect room acoustics even when silent. I could “hear” them. I wondered how music — especially the imaging and soundstaging — could not be affected.

As I sat down to listen for the first time, the visual cues took me back to 1986, to the first time I heard Harry Pearson’s Infinity IRS system, which presented another set of wide-baffled (line-source) speakers just a few feet away from the listening position in a very small room.

But once the music started, skepticism went out the window — in New Jersey as it had in Italy. In some ways the Stradivari’s overall tonal presenta-

bined output of the woofers will be 6dB higher than either alone. This in turn moves the graphed crossover point closer to 450Hz and implies that the frequency region covered by the woofers is a little boosted in absolute terms.

The lower port (red trace) covers a broad, two-octave bandpass from 15Hz to 60Hz, and other than a small peak just above 100Hz, its output is well out of the way in the midrange. The black trace to the left of fig.3 shows how these individual drive-unit outputs sum on a nominal farfield point, taking the radiating diameters, acoustic phase, and different distances to that point into account. The rise in the upper bass and midbass will be due in part to the nearfield measurement technique. But as suggested above, it also results from the use of two woofers increasing the speaker’s overall output in this region, something that I confirmed by looking at the farfield power response (not shown).

As I said in my Ultimate Ears headphone review last month, a little bit of bass equalization can be very appealing, especially if it is not coupled with any overhang in the time domain. Certainly MF found the Sonus Faber’s balance “rich and lush,” which is what I would expect from this measured performance in his mid-sized room. In very large rooms, the Stradivari may well sound neutrally balanced in the bass.

Higher in frequency, there is a suspicious-looking step at 1kHz in the on-axis response, which, all things being equal, might add a slight nasality to the Strad’s perceived balance. However, Mikey didn’t comment on any coloration, nor did I hear any when I auditioned in mono the single speaker I had driven over to my test lab for measurement.

(Listening in mono is by far the best way to detect colorations.) According to the specification, the tweeter comes in at a higher-than-usual 4kHz, which makes it look from fig.3 that the unit is balanced a couple of dB too hot. This may well correlate with Mikey’s comment that the speaker had a bit of HF “sparkle.” Note also that the unit is still giving out almost full output at the 30kHz limit of this graph. This is the first speaker I have measured using a version of the Audio Technology tweeter that didn’t start rolling off above the audioband.

The measurements that were made to produce the plot shown in fig.3 were made with the vertical-strings grille off, which is how Mikey auditioned the Strads.

Adding the grille gave the response changes shown in fig.4. Reflections from the grille resulted in some comb-filtering, as well as rolloffs of about 1dB at 20kHz and 3dB at 30kHz. But these effects are considerably less severe than those of the ostensibly similar grille Krell uses for its LAT and Resolution speakers (see November 2004, p.108, fig.5).

With its wide baffle and high tweeter crossover frequency, the Stradivari will not give as smooth or as
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The sonic picture the Stradivari produced was impressively large, especially in terms of height, though the tweeter is only a little more than 3' from the floor. The tweeters never gave away their locations, driver integration was as good as I've ever experienced in my room — especially for a full-range speaker — and the first sensation was of a velvety-smooth richness and unforced physicality with no particular tonal color. The immediate communicative essence was identical to what I'd heard in Italy months earlier.

Without subjecting it to analytical scrutiny in order to figure out what was causing it to happen, this speaker more than any other I've reviewed, communicated music's emotional content. Listening to the Stradivari was a sensual experience — more in the chest than in the head.

Appreciating this wasn't based on checking off items on an audiophile’s list of performance parameters. The seamlessness of the sonic whole discouraged that kind of exercise — even in the mind of a veteran reviewer. That first day of listening to the Stradivari was a sensual experience — more in the chest than in the head.

In the vertical plane (fig.6), the Sonus Faber’s balance changed only slightly as the microphone moved 5° below the tweeter axis, which is close to the axis Mikey listened on when you take into account the rake-back given the speaker by the front spikes. But stand, or sit on a stool rather than a chair, and a suckout appears at 3.5kHz, which is the actual crossover frequency between the midrange unit and the tweeter.

In the time domain, the Stradivari’s step response (fig.7) is complex. (Ignore the blip at 7.5 milliseconds in this graph, which is due to the reflection of the speaker's sound from the floor between it and the microphone; the Sonus Faber's bulk meant that I was unable to lift it on to my usual high stand for the measurements.) It appears that all four drive-units are connected with the same positive acoustic polarity, but the step of each hands over smoothly to that of the next lower in frequency, which correlates with smooth integration in the frequency domain. Other than some delayed energy associated with the small step at 1kHz in the on-axis response, the Stradivari’s cumulative spectral-decay plot (fig.8) is superbly clean. No wonder Michael thought the Strad offered excellent resolution of detail.

These measurements indicate that Franco Serblin has not sacrificed sound audio engineering in the production of what is one of the most visually stunning speakers I have ever laid my eyes on.

—John Atkinson
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While experiencing the Stradivari’s bass performance, the word I kept coming back to was *solidity* — exactly the word I couldn’t use to describe the bass performance of other Sonus Faber speakers I’ve heard, reviewed, and owned. Those speakers concentrated more on getting bass textures and tonality correct. The Strad changed that — as well it should, for $40,000! — and did so without sounding overdamped or mechanical.

You won’t be disappointed with the deep, tactile, well-controlled, pitch-perfect, solid bass the Stradivari could deliver. It reproduced standup bass properly sized, with a convincing balance of string pluck and woody resonance, and electric bass with mesmerizing rhythmic nimbleness. This speaker could do jazz, rock, and classical equally well and without apology.

The Stradivari's rendering of Speakers Corner's recent "must-have" reissue of János Starker's prized Mercury Living Presence set of J.S. Bach's Suites for Solo Cello (3 LPs, SR13-9016) provided a memorable listening experience. The instrument’s fundamental frequencies range from around 70 to 750Hz. The 300Hz woofer/midrange crossover sits near the middle of that sensitive range, yet the Stradivari’s rendering of the sound of the cello was easily the most convincingly three-dimensional, solid, and silky-rich I’ve ever heard it reproduced. When Starker dug in, the bowscapes never sounded metallic or hard, yet textures were never glossed over. As you might imagine, male voices, which share that range, were equally well served: there was plenty of natural body, but no chestiness, nasality, or bloat.

**ASSOCIATED EQUIPMENT**

**ANALOG SOURCES** Simon Yorke S7, T+A G10 turntables; Immedia RPM-2, Graham 2.2, SME M2 tonearms; Graham Nightingale II, Lyra Titan, Lyra Helikon SL, Shelter 301, T+A C 10 cartridges.

**DIGITAL SOURCES** Musical Fidelity Tri-Vista, Krell Standard SACD/CD players, Alesis Masterlink CD-R recorder.

**PREAMPLIFICATION** Manley Steelhead, BAT VK-10SE phono preamplifiers; Musical Fidelity kWP preamplifier.

**POWER AMPLIFIER** Musical Fidelity kW.

**CABLES** Interconnect: AudioQuest Cheetah, Sky; Harmonic Technology LAM. Speaker: Harmonic Technology Magic Woofer. AC: Shunyata Research, JPS.

**ACCESSORIES** Sounds of Silence Vibraplane active isolation platform, Audiodharma Cable Cooker, Finite Elemente Pagode equipment stands, Walker Audio Precision Isolated Power Motor Drive, Shunyata Research Hydra 2 & 8, ASC Tube Traps, RPG BAD & Abuffero panels.

—Michael Fremer

Overall, the Stradivari delivered the most satisfying, balanced bass and mid-bass performance I've ever had in my room — perhaps most convincingly in the way notes faded, decayed, then cleanly stopped. The bass was never "one-note," and never sounded artificial or mechanical. Instead, it was rich and tactile without sounding sluggish or sloppy. And it was there in ideal proportion to the rest of the spectrum.

It's no coincidence that Franco Serblin chose to run the midrange driver between 300Hz and a highish 4000Hz. That is the fundamental range of the female voice, and if you listen to a lot of it, you will love this speaker. It was magical, whether reproducing Sandy Denny, Joni Mitchell, Mary Black, or Renata Tebaldi. Instead of sibilant, ghostly, throat-centric images, the Stradivari produced, fleshy, solid, full-bodied ones.

How many times have I mentioned Harry Belafonte at Carnegie Hall or the Weavers’ Reunion at Carnegie Hall? The Stradivari reproduced the vocals, male or female, more convincingly as real flesh and blood than I’ve ever heard them sound, and without becoming soft, warm, and cloying over time. In fact, in conjunction with the baffle arrangement, this Audio Technology driver — the same brand Rockport Technologies uses for the woofer and midrange in the Antares that I reviewed in August 2002 — produced the most delicate, textured, coherent, and believable midrange performance I've yet heard — positively addictive, and to a great degree responsible for the Stradivari’s ability to mesmerize and convey music's emotional center.

Crossing over at 4kHz to the ScanSpeak ring-radiator tweeter means the midrange driver handles almost all instrumental fundamentals and the tweeter sees almost entirely harmonics. It also means the cone midrange handles higher frequencies than usual, which with a 6" unit might have a tendency to beam, leading to anomalies in both frequency response and imaging. Whatever John Atkinson's measurements of the Stradivari may reveal in this regard, I noted ultrastable imaging and a subjectively seamless midrange/tweeter transition. It could be that the lush midrange is partially a result of a slight depression near the crossover point. I'll take it!

The ScanSpeak ring-radiator tweeter is a well-respected design featuring a neodymium motor system and a dic-
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cast aluminum chamber, which Sonus replaces with a proprietary wooden chamber as well as adding its own waveguide faceplate. While not sounding quite as supple as Dynaudio's Esotar, the ScanSpeak subjectively offers more uniform off-axis dispersion and greater high-frequency extension.

In this application, I occasionally noted a slight sparkle, perhaps caused by a narrow Q peak in, I would guess, the 10kHz region. Or it could have been the tweeter's response relative to the possible dip at the crossover point. Whatever caused this subtle, not always audible sparkle, it gave the Stradivari's top end an open, airy, transparent sound without adding crispness or edge. I've heard cymbals and other percussion instruments reproduced with more edge and bite, but with a loss of some shimmer. The Stradivari reproduced more of the true "meaty" sound of cymbals that you hear live.

Putting it all together: The Stradivari Homage is a full-range speaker with a big, deep, solid, supple bottom end; a tactile, lush, velvety midrange; and an extended, well-behaved top — all brilliantly integrated by one of the world's premier speaker designers. Above all, what made the Stradivari special over the long haul was its uncanny seamlessness. Which is not the same as saying it did not have a character. Some may find the balance too lush, the transient attack somewhat less than sharp, the resolution of inner detail a bit lacking compared with some of the "fastest" loudspeakers out there. But there are tradeoffs with any design — the fastest speakers usually have a threadbare midrange and somewhat stunted harmonics.

Given the Stradivari's drive-units and the attention paid to its cabinet, you might expect exceptional dynamic abilities. You wouldn't be disappointed. Like all great, large, expensive speakers, the Stradivari delivered the musical goods with a confident grip at both ends of the scale, and without breaking a sweat. Most noticeable were the low-level musical gestures, especially in the bass and midbass region, where, at the ends of familiar bass lines, the speaker seemed to reveal a last bit of decay that had been previously obscured. Played at high SPLs or at a whisper, the Stradivari remained open, extended, velvety-smooth, and in complete control.

The Stradivari's wide baffle produced a singular sonic picture. Instead of the more common narrow-baffle, low-diffraction sound, in which a speaker "disappears" to leave behind a ghostly apparition of a three-dimensional sound picture, the Stradivari presented a more weighty, unusually solid picture that seemed to be a three-dimensional curtain wrapped behind the baffles and extending well back into virtual space. While more conventional baffles have produced wider, more transparent soundstages and perhaps more focused and upfront images, none has delivered such a solid and physically believable three-dimensional soundstage in my room — aided, I'm sure, by the Stradivari's rich, palpable midrange.

Conclusions

Expensive, exquisitely built, with high-quality drivers and crossover components, and superbly finished with a stylishness of which only the Italians seem capable, Sonus Faber's Stradivari Homage is, in my opinion, the finest loudspeaker Franco Serblin has designed, and the most accomplished his company has built. That was his goal, and he has succeeded.

I know many owners of the Guarneri Homage who have told me they think it a better-balanced speaker than the Amati Homage, even if it can't go nearly as low. I don't think Guarneri partisans will feel that way about the Stradivari. For whatever reason(s), the Amati didn't like my room enough to deliver a credible bottom end. (The Aerial 20Ts, which I've heard deliver the low-frequency goods elsewhere, had the same problem when I reviewed them in the April 2004 issue.) But the Stradivari and my room proved to be the best of friends, delivering nearly ideal bass, though I'm sure greater extension and more forceful expression are possible in a bigger venue.

Rated at 92dB efficiency, depending on the phase angle, this 4 ohm speaker shouldn't be difficult to drive. It sounded rich and lush with a brute of a solid-state amp in my room, and with a relatively low-powered tube amp in Italy. I'd stay away from soft-sounding cables and cartridges, but your tastes may vary.

Like the far less expensive Krell Resolution 1, the Stradivari is in some ways old-fashioned in its emphases on the music's physicality and weight, on harmonic richness over resolution of inner detail, and on ear-popping 3D imaging, which has become a fixation among designers — probably, in part, in an effort to create a compelling "picture" to compete with video (call me crazy). Yet the Stradivari also resolves detail and delivers microdynamics, allowing the listener to hear the very last drop of decay and the lowest-level musical gestures with great clarity and without compression. Its balance is notably rich in the midrange, but with its prodigious and well-controlled midbass and low bass and its clean, smooth top end, the sensation of having everything in good balance is achieved with ease.

Beyond the sonic particulars, and more difficult to describe and explain, was the Stradivari's ability to convey music's emotional content. The speaker was not the most analytical and revealing design I've ever heard, but it was illuminating enough. It was, however, the most emotionally communicative speaker I've ever heard. Can a speaker have "soul"? I don't know, but this one comes the closest to making me think so.

THE STRAD IS THE MOST EMOTIONALLY COMMUNICATIVE SPEAKER I'VE EVER HEARD.

A parade of great and expensive loudspeakers has marched through my room in the past year, with more to come. Though some were a less good match for my room than others, all have performed brilliantly, if differentially. Each did some things extremely well. For instance, the mbl 101 E's overall high-frequency performance remains unmatched in my listening experience, as does the Aerial 20T's high-frequency resolution and transient delivery. For $11,000/pair, the Krell Resolution 1 is the biggest bargain in full-range, "CinemaScopic" speakers I've heard. Yet, overall, I kept going back to the $39,000/pair Rockport Antares as my favorite — until the arrival of the Stradivari. Now it's a toss-up. For $40,000, you should have it all, and with all varieties of music. With the Antares and now the Stradivari, if you can afford them, all is what you get. As with the Antares, I envy the audiophile who can afford to listen to, look at, and own a pair of Sonus Faber Stradivari Homages. A stellar achievement.
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Amphion Helium²

Robert J. Reina

Amphion Helium² loudspeaker

My normal practice in seeking out contenders for Affordable Speaker Nirvana is to pursue speakers I stumble across at our Home Entertainment shows, and to keep tabs on new designs from manufacturers whose wares have impressed me in the past. This time, however, editor John Atkinson called me out of the blue: "How would you like to review the Amphion Helium² loudspeaker? It’s the entry-level speaker in a Scandinavian speaker line distributed by Stirling Trayle of Quartet Marketing."

I recalled covering Amphion’s attractive, floorstanding Creon² in my HE2002 show report in September 2002. I had also run across Stirling Trayle several times in my reviewing career, first when he dealt with MIT products at Transparent Audio Marketing, and later at Sumiko. I knew Trayle had a history of associating with interesting high-quality gear.

"Sure, John. Ship ‘em out!"

Amphion was founded five years ago, in Kuopio, Finland. The company builds speakers designed by Antti Louhivaara, and currently produces eight models of hi-fi and home entertainment speakers, ranging from the Helium² ($1000/pair) to the Krypton ($16,000/pair).

The Helium² is a small, two-way, rear-vented satellite sporting a 1" titanium-coated aluminum-dome tweeter, 5.25" Nomex-cone woofer. Frequency response: 50Hz–20kHz. Crossover: 1.5kHz. Impedance: 8 ohms. Sensitivity: 86dB/W/m. Recommended amplification: 20–120W. Dimensions: 12.25" (310mm) H by 6.25" (155mm) W by 10.5" (265mm). Weight: 15.4 lbs (7kg). Finish: Black, Silver; add $250/pair for Finnish Birch or Cherry.

The Helium² loudspeaker

DESI


dSCRIPTION


DIMENSIONS

12.25" (310mm) H by 6.25" (155mm) W by 10.5" (265mm). Weight: 15.4 lbs (7kg).

FINISHES

Black, Silver; add $250/pair for Finnish Birch or Cherry.

SERIAL NUMBER OF UNITS

REVIEWED: 02597.

PRICE

$1000/pair. Approximate number of dealers: 12.

MANUFACTURERS

Amphion Loudspeakers Ltd., PO Box 6, 70821 Kuopio, Finland. Tel: (358) 17 2882 100. Fax: (358) 17 2882 111. Web: www.amphion.fi. US distributor: Quartet Marketing Group, P.O. Box 751360 Petaluma, CA 94975-1360. Tel: (707) 762-0914. Fax: (707) 762-8473. Web: www.myquartet.com.
coated aluminum-dome tweeter and a 5.25" Nomex-cone woofer, the drive-units custom-tailored for Amphion by Audax and Peerless, respectively. All of Louhivaara's designs share two key design parameters.

First, all Amphion models have fairly low crossover points, set below the critical hearing range of 3–5kHz. Thus, according to Amphion, all the frequencies to which the ear is most sensitive are produced by the tweeter. Moreover, because the wavelength of the Helium²'s crossover point of 1.5kHz is greater than the distance between the ears, having a crossover set to that frequency should improve a speaker's imaging—again because only the tweeter handles all frequencies above that point, the range in which the human ear is most sensitive to directional amplitude cues. In addition, the tweeter's low moving mass is designed for faster transients and lower distortion. Finally, the woofer, relieved of handling midrange frequencies, is able to produce cleaner, tauter sound.

Second, all Amphion tweeters incorporate a proprietary tweeter waveguide that uses Amphion's Uniformly Directive Diffusion (U/D/D) technology. This waveguide is designed to attenuate all frequency areas evenly as the listener moves off-axis, thus optimizing the speaker's dispersion. Amphion claims that their speakers' responses in anechoic chambers and real listening rooms are very similar. This should mean that Amphion speakers will perform well even in acoustically challenging rooms.

The Helium² is available in Black or Silver for $1000/pair; add $250/pair for Finnish Birch or Cherry. I thought my Birch review samples, with light gray grillecloths, looked stunning, the total effect understatedly elegant. As usual, I set the Amphions on my trusty 24" Celestion S stands loaded with sand and lead shot.

**A new sound**

As I finished up my listening sessions, I pondered what makes a component a "classic." I decided that a classic is musi-

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**MEASUREMENTS**

As is often the case with minimonitors, the Amphion Helium² is a little below average when it comes to voltage sensitivity, at an estimated 85.5dB(B)/2.83V/m. This is slightly but inconsequentially below the specified 86dB. However, its plot of impedance magnitude and electrical phase angle (fig.1) reveals the speaker to be very easy to drive, the impedance remaining above 8 ohms for almost the entire audioband. This graph was taken with the reflex port open; the saddle centered on 5kHz in the magnitude trace suggests that this is the tuning frequency of the rear-facing port. However, foam plugs were supplied with the speakers, presumably for modifying the bass alignment to work as a sealed box. Inserting a foam plug produced an impedance plot with a single peak in the bass at 78Hz (not shown), which implies that the little Amphion will have a lightweight bass when used in this manner. However, this alignment will likely work well if the speaker needs to be used in close proximity to the wall behind, the boundary reinforcement usefully extending the low frequencies.

Although they are difficult to see at the size fig. 1 is printed in the magazine, there are a few wrinkles in the impedance traces that suggest the presence of resonances of various kinds. That around 25kHz will be due to the metal-dome tweeter's primary resonance, which is high enough in frequency not to be an issue with respect to sound quality. However, the slight glitches between 400Hz and 600Hz might be due to enclosure resonances. Investigating the cabinet's vibrational behavior with an accelerometer revealed a strong resonant mode to be present on the side-wall (fig.2). This might—might—be the...
cally satisfying, exhibits no meaningful flaws, and possesses strengths that one would normally find only in more expensive components. By this definition, my Clearaudio Virtuoso Wood cartridge and Creek 5350SE integrated amplifier are classics. The Amphion Helium2 is another. And the three together are dynamite.

I find it difficult to describe the sound of the Helium2. With one possible exception (discussed below), I can't think of a single area in any frequency range in which the Amphion meaningfully deviated from neutrality. Using other measures, the Helium's exhibited a wide, linear, organic rendition of micro- and macrodynamics and, with all well-recorded acoustic works, "disappeared" as they presented holographic images of instruments on a wide, deep soundstage. The transient attacks of all acoustic and electronic instruments were perfectly realistic, with speed and immediacy but without a trace of artificial hardness or sharpness—the Helium2 may be the affordable speaker for percussion fans. And all vocals, male and female, were silky, liquid, and naturally rich.

But I haven't addressed the one attribute that made the Helium2, for me, a special speaker. On all recordings and in all frequency ranges, the Amphion exhibited a level of resolution of detail that I've never heard from a speaker at or near $1000/pair. I'm not talking about clinically analytical "music under the microscope with a halogen light" resolution. Sure, I was hearing things on recordings I hadn't expected to hear, but at the same time, the Helium2 always created an extraordinarily involving musical experience, regardless of the sound quality of the program material.

It took me much longer to review this speaker than I'd expected, but not because I couldn't get a grip on its merits—those were apparent after the first hour or two of listening. Normally, my standard reviewing procedure is to play four- or five-minute excerpts of two dozen recordings. With the Amphion, those excerpts grew longer and longer; with each excerpt, I got so involved

source of the "hootiness" Bob Reina noted in his auditioning, though it is difficult indeed to predict the effect of cabinet resonances on sound quality.

Turning to the acoustic outputs of the drive-units, to the left-hand side of fig.3 are shown the lower-frequency responses of the woofer when reflex-loaded (green trace), the woofer when sealed-box-loaded (red), and the port (blue), all measured in the nearfield. The sealed-box woofer rolls off below 125Hz or so, but with a relatively slow, second-order slope, as expected. The reflex-loaded woofer has the expected notch in its output at the port's tuning frequency of 54Hz, when the back pressure from the port resonance holds the woofer cone still. All the acoustic output radiates from the port at this frequency, demonstrated in fig.3 by the broad peak in the blue trace centered on 54Hz. However, there is a large peak at 800Hz in the port's output, implying the existence of some sort of airspace resonance at this frequency. The port faces away from the listener, which will work against this resonance having an audible effect. However, it is also possible that it contributes to Bob Reina's feeling that the speaker was a bit "hooty."

The black trace below 300Hz in fig.3 shows the sum of the woofer and port outputs, taking into account acoustic phase and distance from the nominal farfield point. The rise in the upper bass is an artifact of the nearfield measurement technique and should be ignored. The Helium2 appears to offer a textbook reflex alignment. To the right of fig.3 is shown the speaker's farfield quasi-anechoic response, averaged across a 30° horizontal window on the tweeter axis. The region covered by the tweeter is slightly elevated, but not by enough to make the Amphion sound bright. The suckout between 1kHz and 2kHz is problematic but might not be a subjective problem if specific to this listening axis.

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THE AMPHION HELIUM2

Fig.4 Ampthion Helium2, vertical response family at 50°, normalized to response on tweeter axis, from back to front: differences in response 45°-5° above axis, reference response, differences in response 5°-45° below axis.

Fig.5 Ampthion Helium2, lateral response family at 50°, normalized to response on tweeter axis, from back to front: differences in response 90°-5° off-axis, reference response, differences in response 5°-90° off-axis.
late upper harmonics. All dynamic graduations were extraordinarily lifelike, and without a trace of compression on high-level dynamic passages. On the Dizzy Gillespie Octet's *The Greatest Trumpet of Them All* (LP, Verve MGV-8352), I felt the musicians in the room with me and realized that it was possible for a mono recording to portray a sense of depth. The oddball Eric Dolphy's *In Europe, Vol. 1* (LP, Prestige 7304) was a hoot. I reveled in Dolphy's breathy, airy, naturally metallic (but without a trace of hardness) flute on side 1 of this saxless recording, as well as his honky, hooty, spitty, clacky bass-clarinet wails on side 2. The natural forcefulness of the Cecil Taylor Quartet's *Jazz Advance* (LP, Transition GXF 3121), from early in Taylor's career, was a dynamic showcase for his rich, woody piano tone as he traded fours on standards by Duke Ellington and Monk. After I'd exhaustively mined my jazz collection, my summary notes read: "the most natural acoustic bass sound I've heard from a bookshelf speaker."

I'm trying to avoid such gushing as "I heard familiar recordings as if for the first time!" But in many cases, I discovered new things on recordings that I've played dozens of times. On the most overplayed recording in my house (my son has the lyrics memorized; my wife goes shopping when she hears me cue it up), Janis Ian's *Breaking Silence* (LP and CD, Analogue Productions CAPP 027), I noticed for the first time how melodic a player of the fretless bass Chad Watson is, and what a wonderful tone he gets out of his instrument. Similarly, I found myself focusing on the subtle textural background details added by percussionist Jim Brock.

On my favorite Stereophile recording, Koligia's *Transmigration of the Soul*, from Festival (CD, Stereophile STPH007-2), I noticed that, during the most bombastic passages, the flute doubles the cello. When a speaker is very revealing, it's apparent to me that John Rutter's *Requiem* (CD, Reference RR57CD) was recorded in a church. With the Amphion, I could estimate the church's size. Moreover, I noticed for the first time that the soprano soloist's pitch falters in a few passages. On "How am I Different," from Aimee Mann's *Bachelor No. 2* or *The Last Revealing of the Dodo* (CD, Super Ego SE002), it was clear to me that the guitarist was playing through a high-quality tube amp, probably a modern 6L6-based design. And during the crescendo in the chorus of this wonderful tune, I got the chills running down my legs that I normally experience only when listening to very expensive gear.

In reviewing such a tiny bookshelf speaker, I would be negligent if I didn't address its bass extension and high-level dynamics. Again, I shook my head as, in these two areas, the Amphion behaved like a floorstander. The bass drums on such bombastic orchestral works as Stravinsky's *The Firebird* (LP, Mercury Living Presence/Classic SR 90226) and Messiaen's *Turangalila Symphony* (LP, EMI UK SLS 5117) were reproduced with perfect transients, weight, definition, and extension. Dean Peere's electric bass on "Lord's Tundra," from his *Dune* (LP, Jazz Planet/Classic JP 5002-1), was articulate and appropriately rumble.
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Cranked up to disco levels, the bass synth on "Feel No Pain," from Sade's Love Deluxe (CD, Epic EK 53178), cooked and shook the room. I was, however, able to crank the Messiaen to a level that compressed the orchestra a bit during the loud passages.

Which brings me to my one small reservation about this speaker. On just two recordings, there were loud passages—closely miked female vocals on Madeleine Peyroux's Dreamland (CD, Atlantic 82946-2), and wailing upper-register alto sax on Jerome Ham's "Mooche," from Editor's Choice (CD, Stereophile STPH016-2)—where, within a very narrow frequency range, the Amphion exhibited a slight "hootiness." I don't know if with these recordings, there was a very narrow resonance within the speaker that manifested itself, or if I happened to push the speakers just a bit too much (the volume level was high), or if these were anomalies in the recordings that the Amphion revealed. I'm anxious to see if JA's measurements and experience (he was the recording engineer on the Harris track) shed any light on this.

A new competitor
I compared the Amphion Helium loudspeaker ($1000/pair) to the NHT SB-3 ($600/pair), the Alón (now Nola) Li'l Rascal MK.II ($600/pair), and the now-discontinued Alón Petite ($1000/pair).

The NHT SB-3's midbass was warmer and richer than the Amphion's, with an overall presentation that was more romantic and less detailed. The highs were sweeter and less extended than the Amphion's, but the NHT's overall presentation was well balanced.

The Alón Li'l Rascal MK.II had a more dramatic lower-bass presentation than the Amphion, but its midbass was somewhat warmer. Although the Alón's rich mids were less extended than the Amphion's, the NHT's overall presentation was well balanced.

The Alón Petite Li'l Rascal MK.II had a more dramatic lower-bass presentation than the Amphion, but its midbass was somewhat warmer. Although the Alón's rich mids were less extended than the Amphion's, the NHT's overall presentation was well balanced.

The Alón Petite's midbass was as clean and pure as the Amphion's, and its high-frequency extension and articulation were excellent. But the Amphion seemed even more detailed and delicate in this region. The Amphion's lower-bass and high-level dynamic performance, however, were better than the Petite's.

A new benchmark
Usually, when one seeks a small, affordable bookshelf speaker, there are tradeoffs to be considered. With the Amphion Helium\(^2\), there were no tradeoffs. What can I say about a speaker that presented no meaningful shortcomings, and whose strengths are those I expect from speakers costing twice its price, or more? Overall, and by a wide margin, the Amphion Helium\(^2\) exceeded the performance not only of any affordable loudspeaker I've ever reviewed, but of any affordable speaker I've ever owned. It's a classic.

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— Jimmy Hughes, Hi-Fi+, Issue 34, pages 88 to 91

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— Oz Fritz, Sound Engineer

Oz Fritz has worked as a sound engineer in both recording studios and live concert environments for more than 25 years. His credits include work with Tom Waits, John Hammond, Iggy Pop, Ginger Baker, Herbie Hancock, George Clinton and many more. In August of this year, Oz spent a week at Blue Heaven Studios recording a to-be-released John Hammond record.

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Kevin Gray is a mastering and cutting engineer with more than 30 years experience, Kevin Gray has credits on multiple albums gone platinum and Grammy. Gray is the mastering engineer for and part owner of AcousTech Mastering in Camarillo, California.

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PATHOS
THE UNORTHODOX APPROACH
Giuseppe Verdi gave the world more than two dozen operas, some good sacred music, and one string quartet. He also provided the young Arturo Toscanini with one of his first big breaks—conducting the singing of “Va pensiero” at his burial procession—and gave the flagship consumer product from England’s dCS Ltd. its name. That the latter two gestures were posthumous and unwitting does nothing to diminish their poetry.

The dCS Verdi is a grandly expensive ($14,995) CD/SACD transport, introduced in 2001 and intended for use in the world’s finest domestic replay systems. (dCS also designs and manufactures digital audio equipment for the pro market.) The brand-new Verdi La Scala, the surname of which honors the opera house that gave witness to the premieres of so many of Giuseppe Verdi’s masterpieces, is an even grander version of the dCS transport, and one that contains a key refinement: The Verdi La Scala is an upsampling transport. File that away for later.

I reviewed the Verdi La Scala in tandem with dCS’s own Delius digital-to-analog converter, partly because the transport can’t make music without a DAC of some or another sort, and partly because the Delius, which was introduced in 1999, has yet to be discussed in these pages. I did not use the dCS Purcell consumer upsampler as a part of the review system (see Stereophile, April 2003) because a Verdi La Scala is a dCS Verdi plus a dCS Purcell, wrapped up in the same box (but see below). And I did not use the dCS Verona master clock as part of the review system, because John Atkinson is reviewing that himself, and he’s the boss.

Confused yet? Hold on to your hats.

Ring first

The Verdi La Scala is built into a double-stack version of the standard dCS chassis: a foursquare but finely made thing that uses a clever arrangement of rubber ridges instead of feet, making the various dCS products easy to stack and seeming to provide very good resistance to external vibrations. The CD mechanism is...
a Sony twin-laser drive, and the supporting electronics are contained on three substantial boards below the transport proper, along with a digital (switching) power supply. The serenely pretty front panel contains all the controls you'd expect on a transport, plus a few you might not, for scrolling through and selecting different software choices. There's also a bidirectional knob, useful for all the above.

Crack open a Delius and you'll see another digital power supply, six especially chunky electrolytic caps, some nice-looking crystal oscillators (for the clock, I'll bet), a 32-pin PROM socket, and a whole lot of chips. Some of the parts and PCB traces are so tiny and crammed so close together that it hurts to look at them. Fair enough: If I were to assemble something like this, I'd charge several thousand dollars for labor alone.

But what do all those pieces do? And do you really need them all—knowing that we live in an age when you can buy a pink portable Hello Kitty CD player that runs on batteries and does ostensibly the same thing? I'll try to answer that, God help me. But let's pause first and:

Consider that, in the pre-DSD world of D/A converters, consumers had a choice between two different schemes: multibit and single-bit, the former preceding the latter as a consumer reality by a few years, but the latter actually preceding the former as a theory for a great many more years.

Multibit PCM, the technology at the heart of those first run-right-out CD players of 1983, was capable of reproducing sound with a certain degree of success. But as chip technology improved in the ensuing years, the idea of single-bit conversion once again appealed to some engineers, owing to its greater simplicity and ease of implementation. (A 16-bit system calls for 65,536 possible electrical values to be available in constructing the music waveform, which is devilishly difficult to engineer with real accuracy.) But even in the best implementations, a problem remained in that single-bit

because Stereophile has already reviewed both the dCS Verdi SACD/CD transport (in April 2003) and the Purcell upsampler (in January 2001 and April 2003), I didn't feel it necessary to measure the Verdi La Scala, which incorporates the functionality of both units in one chassis. I concentrated, therefore, on the Delius D/A processor, feeding it DSD-sampled data from a Verdi transport and 16- and 24-bit LPCM data from a computer, using an RME Digi96/8 Pro soundcard and a TosLink S/PDIF connection. The Delius had no problem locking on to data sampled at rates up to 96kHz with a single connection or at 192kHz with a dual AES/EBU connection.

As reviewed, the Delius' maximum output was 2.025V RMS with both DSD and LPCM data, 0.1dB higher than required by the CD standard, and the volume control operated in accurate steps of 0.5dB. The Delius preserved absolute polarity from both unbalanced and balanced outputs, the latter wired with pin 2 hot. The output impedance was very low, below 0.5 ohm, at almost all frequencies, rising slightly at 20kHz to just below 1 ohm.

Fed CD data, the Delius' frequency response was perfectly flat in the audioband (not shown).

Using the factory default filter setting with DSD data (fig.1, top traces), the response extended out to -3dB at 72kHz. With 96kHz-sampled data, the output was down 3dB at 41kHz; with 192kHz data, the output extended to 90kHz. Channel separation (not shown) was excellent at 103dB R–L and 114dB L–R across the audioband.

The Delius offers superb resolution, as shown in fig.2. This graph was produced by sweeping a 1/8-octave-wide bandpass filter

MEASUREMENTS

![Stereophile dCS Delius Dithered 1kHz @ -90dBFS (16/24-bit/DSD data) dB vs Hz](image1)

Fig.2 dCS Delius, 1/8-octave spectrum of dithered 1kHz tone at -90dBFS, with noise and spuriae, DSD SACD data (top above 5kHz), 16-bit CD data (top below 5kHz), and 24-bit PCM data (bottom). (Right channel dashed.)

![Stereophile dCS Delius, departure from linearity, 16-bit (top below ~90dBFS) and 24-bit PCM data (right channel dashed, 2dB/vertical div.](image2)

Fig.3 dCS Delius, departure from linearity, 16-bit (top below ~90dBFS) and 24-bit PCM data (right channel dashed, 2dB/vertical div.).
digital is more prone to quantization noise, thus putting the emphasis back on the need for more and more clever filtering techniques. Low-level nonlinearities or quantization noise: Will it be the tiger or ... the other tiger?

In the early 1990s, dCS introduced a sort of a compromise between the two technologies: a completely original D/A design called the Ring DAC, a five-bit, 64x-oversampling system implemented using FPGAs and standard logic. (These days it can be done on a single chip, à la Philips or Burr-Brown.) The Ring DAC's designers believed theirs was a more linear approach to re-creating an analog waveform than single-bit or multi-bit, and in its first consumer implementation—the successful dCS Elgar DAC, now in v.4.22 Elgar Plus guise—the process was claimed to offer the first true 24-bit performance on the consumer market. And while this may be an oversimplification, one can see in the first Ring DAC at least some hint of Direct Stream Digital, with its single-bit processing and very high sampling rate.

But the Ring DAC is no longer the only peg on which dCS hangs its hat, the company having now brought upsampling to the masses. As contrasted with an oversampling filter, which processes the datastream at a higher frequency in order to shift the spectrum of quantization noise up and away from the range in which it is most influential (and not in an effort to feign greater information density), upsampling is a process in which the sampling rate is down from 20kHz as the Delius was fed 16- and 24-bit LPCM data, then DSD data, all three representing a dithered 1kHz tone at -90dBFS. The top trace below 5kHz in fig.2 shows the spectrum produced with 16-bit data. The tone peaks exactly at -90dBFS, and the noise floor is basically that of the dither used to linearize the data. Increasing the word length to 24 bits (bottom trace) drops the noise floor by 14dB or so in the treble, implying almost 19-bit performance, which is excellent.

DSD data produced the usual rising trace in the treble (top trace above 5kHz), due to the presence of the 1-bit encoding system's noiseshaping, but is as good as 24-bit PCM in the midrange and treble. Note the presence of some very-low-level power-supply hum with the hi-rez data: a 60Hz component present at -125dB in both channels and a 180Hz component in the right channel at the same level. These are presumably due to magnetic coupling from the power transformer, but are so low in level that they will be inconsequential.

As well as very low noise, the Delius features superb DAC linearity. The error in absolute level is plotted in fig.3, taken with both 16- and 24-bit PCM data. With 16-bit data (top pair of traces), the slight positive error seen below -100dBFS is due to the dither noise, not to the DAC itself. With 24-bit data (bottom traces), the error remains below ±0.25dB to the left-hand edge of the graph at -120dBFS. This is superb DAC performance, so it came as no surprise that the dCS's reproduction of an undithered 16-bit sinewave at -90.31dBFS (fig.4) was essentially perfect, with the three discrete voltage levels readily evident and the positive- and negative-going steps precisely balanced. Increasing the word length to 24 bits gave a good facsimile of a sinewave (fig.5).

Distortion was at the limit of my measurement system,
increased prior to conversion in order to eliminate the need for steep-slope analog filtering altogether—allowing the designer to do all of those things benignly, in the digital domain.

And while it may seem easy to explain, upsampling is a great deal harder to justify, at least in technical terms: Plainly put, there’s no reason to expect a digital audio system to sound better just by putting, say, a 44.1kHz recording through a 176.4Hz DAC without actually increasing the amount of information. Yet, while acknowledging this apparent contradiction, dCS suggests that upsampling works nonetheless. And consumer reaction, not to mention reviewer reaction, to the first consumer upsampler, the dCS Purcell (1999), seems to have borne them out.

But does upsampling sound better simply because it makes it easy for the best (digital) filters to do their job? Does it work, as some have suggested, because the comparatively shallow filtering that’s part of the package leaves some high-frequency artifacts that consequently act as another round of dither? Or is it something else?

I don’t know. Neither do the good people at dCS—although they say they’re working hard to find out.

Fun later
The two products at hand comprise a sort of economy version of the full-monty dCS front-end. I mentioned earlier that a dCS Verdi La Scala is the same thing as a dCS Verdi transport plus a dCS Purcell (accent on the second syllable, please) in the same box. But I said that only to be cute: It isn’t actually true. The Verdi La Scala is indeed an upsampling version of the Verdi, but the only upsampling it does is to bring the data from “Red Book” CDs up to the 2.822MHz standard of DSD. (By using the word only I don’t

with a 1kHz tone at 0dBFS reproduced with just 0.0007% THD (true sum of the harmonics). As shown by fig.6, the second harmonic was the highest in level in the left channel, at just -104.5dB but below the noise floor in the right channel. (Ignore the low-level spuriae in this and fig.7, which are due to a ground loop that I couldn’t eliminate between the Delius and the computer that houses the National Instruments PCI card that I used for these measurements.)

Intermodulation distortion was also vanishingly low in level (fig.7).

Only in its rejection of word-clock jitter on external data did the Delius stumble a little. Fig.8 shows a narrowband spectrum of the Delius’ analog output while it decoded 16-bit data representing the diagnostic signal developed by the late Julian Dunn. Data-related components (indicated with red numeric markers) are fairly low in level, but the noise floor is a little higher than the best CD-playback components I have measured, and is marred by many discrete noise spikes. The measured jitter level was 424 picoseconds peak—peak, which is about three times higher than the best components I have measured on this test. It seems to stem mainly from sidebands with frequencies 1.4kHz on either side of the central tone (purple “11” and “12”).

Increasing the word length to 24 bits reduced the jitter to 399ps, due to the data-related components dropping below the noise floor, but the noise spikes remained in evidence (not shown). Playing the 16-bit jitter signal CD on the Verdi transport without

1 Notably, the brilliant Douglas Rife—no stranger to these pages—whose DRA Labs developed the MLSSA software relied on by Our Mister Atkinson for loudspeaker measurements.
mean to diminish the thing’s effectiveness: That’s quite the stunt, if you ask me.) If you use other digital sources in your system, and you wish, for example, to upsample a 16-bit/44.1kHz input to a 24-bit/192kHz output, you need something like the standalone Purcell—which also lets you select among three different dither schemes, control the noise shaping to your liking, and other such niceties.

The Verdi La Scala puts out a 2.822MHz DSD datastream through an IEEE1394 jack, primarily because that’s the way Sony Corporation, co-inventor of DSD, wants it done. But since the 1394 is an asynchronous connection with a data buffer at each end, it isn’t terribly good with timing information. So rather than trust the D/A converter to extract the word clock from the datastream, you must run a separate BNC-terminated cable from the word-clock output jack of the Verdi La Scala to the word-clock input jack of your converter—which, in an all-dCS system, will typically be an Elgar Plus or (ta-da) a Delius.

A pause to review: If you want to hear true DSD or upsampled-to-DSD sound from your system, the simplest setup scheme is to run two cables from the Verdi La Scala to the converter: one to carry the datastream via the IEEE1394 connection and one to carry the word clock. Simple.

Let’s back up a few yards: If you just want to play your Verdi La Scala through an old-fashioned, non-DSD converter, either as a stopgap measure or because you prefer it that way, all you need is to run a single cable from one of the Verdi La Scala’s many AES or S/PDIF outputs to the input of your D/A. In that setup, your D/A converter will indeed extract the word clock from the datastream coming off the disc, even with single-layer SACDs! It can do that because, while the Verdi La Scala is capable of upsampling “Red Book” data to the DSD standard and outputting it at the 1394 jack, it also downsamples true DSD to 16/44.1 and makes those data available at all of the

upsampling, with the Verdi acting as the word-clock master reduced the jitter level to 291ps, while slaving the transport to the DAC’s word-clock output gave a further reduction to 276.5ps. Interestingly, deriving the master clock from the DAC pushed the jitter sidebands up higher in frequency (fig.9).

I don’t have an SACD with the diagnostic tone, but Sony’s “provisional” Test SACD has a high-level tone at 11.025kHz. Playing that track on the Verdi into the Delius gave the spectrum shown in fig.9. The noise floor is higher than with PCM data because I had to reduce the playback level to avoid clipping the measurement card’s ADC. (I used an external analog volume control rather than the Delius’ digital control to keep the playing field level.) The jitter level is an extraordinarily low 63ps, but this will be mainly due to the tone not having the low-level content to induce data-related jitter.

The Delius didn’t reject word-clock jitter from external S/PDIF data sources as much as I would like to have seen, though it is fair to point out that this will be a nonissue when the Delius is used with the La Scala transport. In all other respects, its measured performance is beyond reproach.

—John Atkinson

Fig.9 dCS Delius, 16-bit CD data, high-resolution jitter spectrum of analog output signal; source, dCS Verdi word-clock-slaved to Delius, IEEE1394 data connection (11.025kHz at -6dBFS sampled at 44.1kHz with 1.56 toggled at 229Hz). Center frequency of trace, 11.025kHz; frequency range, ±3.5kHz.

Fig.10 dCS Delius, DSO data, high-resolution jitter spectrum of analog output signal; source, SACD played on dCS Verdi transport, Delius word-clock-slaved to Verdi, IEEE1394 data connection (11.025kHz at -6dBFS). Center frequency of trace, 11.025kHz; frequency range, ±3.5kHz.
other jacks. Among other things, that means that the consumer who's working his or her way toward a full dCS system can use just a Verdi La Scala with virtually any converter and still enjoy music from SACDs. Very cool.

And while it doesn't do everything that a Verdi plus Purcell can do, the Verdi La Scala has some other nice tricks up its sleeve. You can use it to send DSD/upsampled "Red Book" to one set of your DAC's inputs, and non- upsampled or even downsamped data to another. You can program it to defer to either the SACD or "Red Book" layer or your hybrid discs, as you wish. You can tease all kinds of information from its display, including serial number, software version number, and, so help me God, the temperature of its circuit board, in Celsius or Fahrenheit. You can use it to burn in your other components with modulated pink noise—something even the pink Hello Kitty player can't do. (My daughter was impressed when I explained this to her.)

And if you think the Verdi La Scala is a clever thing, the Delius will leave you reeling.

Engineered into the Delius is a fully digital volume/balance control, workable from either the front panel or the remote handset. In both cases, the adjustments are fine and smooth. Other digital controls include polarity inversion, more pink noise, various display settings, and a choice of several different antialiasing filter curves for "Red Book" and low-pass filters for DSD. Once you get the hang of the dCS menu system, those filters are easy to select; the Delius remembers the last filter used for each given sampling rate, and uses it again unless advised otherwise.

The Delius also has its own word clock, which the dCS engineers suggest can be used to reduce system jitter overall. As I mentioned earlier, a typical DSD-capable installation involves connecting the Verdi La Scala's word-clock output to the associated DAC's word-clock input. But for theoretically better performance, the person who owns both of those dCS products can instead run a cable from the word-clock out of the Delius to the word-clock in of the Verdi La Scala. (One must then run a quick software routine to tell these two playmates that the game has changed, and that the one that had previously done the hiding must now do the seeking. It takes about six seconds.) Thus the entire digital front-end is timed to a single master clock, without having to worry about extracting same from the datastream itself.

Finally, it's worth noting that the Delius can be used to drive a power amplifier directly, from either its unbalanced (RCA) or balanced (XLR) output. The output voltage can be altered, also through the software menu, to suit virtually any system.

**Setting up and listening**

For the user accustomed to portables and one-box players, installing and setting up a dCS combination may be somewhat daunting. That complexity is unavoidable, given these components' undeniable—and undeniably laudable—flexibility, but there's no getting around the fact that the Verdi La Scala and Delius require some quiet study in order to understand and exploit their abilities. dCS seems to acknowledge this, both in the thickness of their user manuals and in their inclusion of laminated software "flow charts" for quick reference. If you're actually reading this review and not just looking at the pictures, you'll have no trouble whatsoever—as long as you take your time and follow the instructions in the proper order. And keep in mind that the flexibility of these components is intended not only to provide good performance today but also to allow for future software upgrades, virtually without limit.

Now then: My preference for analog sources is no great secret, and I often find myself swapping opinions on the subject with folks from all over the map—but I'm forever amazed at the wildly different reasons some people have for their own vinyl enthusiasm. We're all hearing the same things, I suppose, but we're all coming away from the experience having made sense of only some portion of the whole, like the blind men and their elephant. Whether or not that's a bad thing, I'm in no position to say.

Remarkably, the musical and sonic accomplishments of the dCS digital gear contain something for all of us analog diehards. If the things you prize most about vinyl are the smooth and naturally extended trebles, and the extraordinary spatial depth of which the medium seems capable, then you'll declare the dCS system to be the most analog-like digital front-end available, and you'll cherish it.

**ON DISC AFTER DISC, CD AND SACD ALIKE, THE dCS COMBO ALWAYS SOUNDED MAGNIFICENT AND REALISTICALLY COLORFUL.**

Similarly, if what you value most about vinyl and analog tape is the natural flow, momentum, and pitch correctness of the music itself—and this is the porch I rock on—the combination of Verdi La Scala and Delius will satisfy you in a way that no other digital front-end of my experience can manage.

On disc after disc, CD and SACD alike, the dCS combo was never commonplace: It always sounded magnificent and realistically colorful. Even CD-Rs of old bluegrass performers—little more than field recordings, really—grabbed my attention more on this front-end than on anything else. And SACDs sounded smooth and layered and organic in a manner that my Sony SCD-777 SACD player can't quite swing, bless its heart.

I could cite disc after disc, and describe in affectionate detail the minutiae of sonic differences, but that would be a waste of time when one simple observation will do: The combination of the dCS Verdi La Scala and Delius sounded more like analog than any other digital source I've ever heard. As a lover of good music and good sound, this system left me wanting for nothing except the means to afford it.

But you must bear in mind one unsmall matter: All that goodness depended on a number of things, some of which may confound your expectations:

Without the slightest doubt, the com-
bination worked better at playing music when the Delius was in Master mode—overriding, as it were, the word clock in the datastream and that produced by the Verdi La Scala. The former didn’t so much sound different (although imaging junkies may not agree, given their heightened sensitivity to such things as stage dimensions) as simply allow me to relax and be fooled into thinking I was hearing as simply allow me to relax and be fooled into thinking I was hearing music when the Delius was in Master mode.

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Requiem—a mildly tarted-up Sensaura recording (United 88033)—was more effective through the Delius.

Here's a comment probably not germane to the spirit of this comparison that I'll make anyway: The $1400 Shigaraki wasn't the least bit embarrassed by the $9995 Delius, although the latter's sophistication was obvious. After the first weeks of the review period, during which I did the bulk of my component swapping and note taking, many was the time I found myself leaving the Verdi La Scala and Shigaraki combo in place—and enjoying the hell out of it. I don't think the pairing is silly at all.

Conclusions
But then, I didn't have to pay $15,000 in order to enjoy the Verdi La Scala for four months. And this is the third time in two years I've borrowed a Shigaraki DAC, which leads me to wonder if I should let it make an honest man of me, or stop trying to get milk without buying the cow, or whatever that aphorism is supposed to be.

Once again, the high price of a product—or a pair of products—is the 800-lb gorilla in the corner, and it's time to acknowledge his presence. This is not a "maybe" kind of thing: I have absolutely zero doubt that the prices of the dCS products fairly reflect what it took to develop and manufacture them. And I respect the extent to which their US distributor, Audiophile Systems, has resisted profit-taking on the line: A quick comparison of the prices on their website and on the dCS site will confirm that American hobbyists are not being gouged in the least.

$25,000 may not exceed the cost of what went into these marvelous things, but it does exceed what I'm able or even willing to pay for a CD player. Thankfully for dCS—and, arguably, for the notion of progress in our hobby—there remain consumers out there who can and will ante in for the sake of having the best right now. The combination of the Verdi La Scala transport and Delius D/A converter may well be it: It certainly is in the context of my own experience.

The dCS system, the worth of which is so tied to the ingenuity of its software, is like a brilliant new book just out in hardcover: I respect, and to some extent envy, those who line up to buy it, even as I conspire to wait a few years for the paperback.
Over the last couple of years I've listened to a lot of one-box universal and SACD players from the best manufacturers in the world. Ranging in price from $5,000 to $11,000, all of them were significant improvements upon earlier digital single-chassis source components in playing all formats. However, none of them came even vaguely close to the top rated two-box solutions. No problem. The separate Transport/DAC units cost almost twice as much. Enter the Esoteric X-01 SACD/CD player and the Esoteric UX-1 universal player.

All of a sudden, for $13,000, you could get sonic performance remarkably close to separate components at about half the price. I think I know why.

The ESOTERIC UX-1 Universal Player and its sister model, the X-01 SACD/CD player are both armed with the new ESOTERIC VRDS-NEO mechanism. The patented VRDS (Vibration-free Rigid Disc-clamping System) technology, hailed by critics for its vibration elimination performance in ESOTERIC'S CD transports, has, in the X-01 and UX-1, been further refined and extended to a transport for SACD and DVD formats.

Spinning at an average of 4.5 times the speed of a CD, SACD/DVDs create such intense rotational vibrations that conventional players are unable to read all the information on the disc accurately. This results in the need for huge amounts of error correction. Using powerful new drive motors, extremely rigid components, ultra-high precision ball bearings, a magnesium turntable, and a coreless motor with no rotational irregularities, the VRDS-NEO mechanism is designed to eliminate vibrations and completely stabilize the disc, resulting in near flawless data retrieval.

That means you hear the music as it was originally performed, not by error correction algorithms in the player -- which is why you wanted an SACD/DVD player in the first place, to hear the music, and nothing but the music.
McCormack Audio UDP-1
UNIVERSAL DISC PLAYER

The modification of disc players is a hot topic on the various audio newsgroups, where the discussion includes do-it-yourself options and the recommendations of commercial modifiers. These range from tweak guys to such serious engineering firms as EMM Labs and everything in between. Not surprisingly, the objects of these endeavors are usually players made by one of the electronic behemoths: Sony, Philips, Technics, Toshiba, etc. In fact, it was just such a discussion that precipitated John Atkinson’s purchase of and recent comments1 on a stock Toshiba 3950 player, a popular target of modifiers. But mods are nothing new. In fact, they’re not much different from what’s practiced by most high-end manufacturers, who buy transports from the same handful of producers and use the same control electronics. In addition, the library of integrated circuits used for the signal processing of CD, SACD, and DVD-Audio signals comes entirely from a few OEM chip houses (Analog Devices, Burr-Brown, Cirrus, Motorola, etc.), often supplemented by chips by those same mass-market component producers. As a result, high-end disc players can bear uncanny resemblances not only to one other, but sometimes to the far cheaper players found in the big-box electronics supermarkets. This is not to say that high-end components are “me too” products, but acknowledges that they themselves are already much tweaked, and that the differences between them lie in the choices of components, the implementations of original DSP algorithms, and, most important, in developing and building the products to performance levels that will satisfy audiophiles.

McCormack Audio’s UDP-1 universal disc player is another brainchild of Steve McCormack, who made his name, years back, as the mover behind The Mod Squad, a West Coast tweak-and-modify firm. Since then McCormack products have always borne the stamp of Steve’s original thinking, as well as a reputation for quality, performance, and reliability. However, McCormack is now based on the East Coast,
under the wing of Bill Conrad and Lew Johnson of Conrad-Johnson. Steve McCormack’s more recent products, exemplified by the new DNA amplifiers, the MAP-1 multichannel preamplifier, and now the UDP-1, have a bit more flash than the old Mod Squad gear. And while flash contributes not at all to good sound, it does give some additional pride of ownership.

Audio and video – or audio vs video?
The UDP-1 can do almost anything you might demand of a universal multi-channel player. In addition to plain-vanilla CD, SACD, DVD-Video, and DVD-Audio discs, this baby decodes Dolby Digital, DTS, and even MP3 files, with file displays better than anything this side of Windows. The front-panel layout is fairly standard for a player based on a Pioneer transport. There’s a moderately sized display panel beneath the central disc tray. To the left are only the Standby pushbutton and indicator; to the right is a staggered array of buttons for disc load, stop, pause, and play (top row), and progressive/interlaced scan, video off, skip-track forward and skip-track back (bottom row). The rear panel has TosLink and coax digital audio outputs; stereo L/R and multichannel L/C/R/LS/RS/Sub analog audio outputs; composite, S-video, and component video outputs; and an IEC power connector. These few controls and connectors are entirely adequate for all of the UDP-1’s regular operations; the complexity comes with the remote control and the onscreen menus.

The remote is more comprehensive than most. Suffice it to say you’ll use it much more than the few controls on

MCCORMACK AUDIO UDP-1

MEASUREMENTS

looked only at the main left and right outputs. To my surprise, the McCormack offered a lower maximum output level from SACD than it did from CD or DVD-Audio: 1.99V vs 2.35V. This is a difference of almost 1.5dB, which, if not compensated for, will mess up any direct comparisons of SACD and DVD. In addition, the UDP-1’s output inverts signal polarity, which will be a confusing factor in comparisons with other players.

McCormack doesn’t specify the output impedance; I measured 319 ohms across most of the audioband, this rising to 500 ohms at 20Hz. As long as the preamplifier has an input impedance of 10k ohms or greater, the UDP-1 will not suffer from lean-bass syndrome.

The UDP-1’s CD replay offered the usual flat response with both normal and pre-emphasized recordings (fig.1).

With hi-rez media, the ultrasonic responses with SACD and DVD-A differed (fig.2). The DVD-A data show a flat response up to 42kHz, with then a sharp rolloff, while the SACD data roll off more slowly, being 1dB down at 45kHz, —3dB at 62kHz. Channel separation (not shown) was superb, at better than 120dB below 2kHz, and still better than 100dB at 20kHz. Error correction was only fair, the UDP-1’s output suffering audible glitches with gaps in a CD data spiral 0.75mm in length.

While I disagree with those conservative audio commentators who write that the increased resolution offered by 24-bit/96kHz LPCM or DSD does not offer audibile benefits, I do feel that the new media players are obliged to preserve that resolution. And here the UDP-1 stumbled. Fig.3 shows 1/2-octave spectral analyses of the player’s output while it decoded dithered data representing a 1kHz tone at —90dBFS. Usually, 24-bit data give a much lower noise floor than 16-bit, which you can see in this issue’s measurements of the dCS Delius D/A processor. However, as shown by fig.3, the McCormack’s noise floor is only a dB or so lower with 24-bit DVD-A data than it is with 16-bit CD data. If a DVD-A contains true hi-rez data — a big “if” — the McCormack will not resolve those data.

How about SACD playback? Fig.4 shows the spectrum resulting from playing back a tone at —90dBFS from a test SACD. Other than the rise in noise in the high treble due to the DSD encoding, this spectrum is identical to that in fig.3. The McCormack will not offer any more resolution from SACD than it does from CD or DVD. And note that in these two graphs, the left channel is noisier than the right at low frequencies, but that both channels are afflicted with power-supply

Fig.1 McCormack UDP-1, CD data, frequency response at —12dBFS into 100k ohms, with de-emphasis (bottom) and without (top). (Right channel dashed, 0.5dB/vertical div.)

Fig.2 McCormack UDP-1, DVD-A (top at 30kHz) and SACD data, frequency response at —3dBFS into 100k ohms (right channel dashed, 0.5dB/vertical div.).

Fig.3 McCormack UDP-1, 1/2-octave spectrum of dithered 1kHz tone at —90dBFS, with noise and spuriae, 16-bit CD data (top) and 24-bit DVD-A data (bottom). (Right channel dashed.)

Fig.4 McCormack UDP-1, 1/2-octave spectrum of dithered 1kHz tone at —90dBFS, with noise and spuriae, 5D SACD data (right channel dashed).
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the front panel, even if you're much less sedentary than I. In addition to the remote's direct track-access buttons (without the annoying "$>10" button), Audio can switch playback formats, Surround invokes a faux surround effect in two channels, and there are many other buttons that, with a display, give one full control without having to rise from one's seat. Uncommon among audio players is the UDP-1's inclusion of a selectable multispeed jog wheel for fine control of video program playback. At the bottom of the remote is a group of buttons that can be set to control a TV or monitor from a small list. Sadly, it can't be set to control the matching McCormack MAP-1 preamp. Duh.

All of this wouldn't mean much if the onscreen display, or graphic user interface (GUI), weren't up to snuff. Overall, I found the UDP-1's menu organization, navigation, assistance, and display the best I've used to date. First, the multicolored panels of the menus are a welcome change from the typical single color. Second and more important, the UDP-1's menus offer onscreen help and explanations of the options, often in simpler and clearer terms than does the small print in the poorly organized manual. Third, the array of options for audio and video setup is impressively wide, including track programming, bass management (settings limited to Small and Large), distance compensation for multichannel speakers, as well as meaningful video calibration controls. One can even have a running display, in real time, of the magnitude of the audio datastream. With all this richness, the UDP-1's operation is easy to understand, and there's a helpful setup navigator for first-time users.

The UDP-1's feature set seems, however, to be philosophically inconsistent. On their website and in all their documentation, McCormack emphasizes the player's audio performance. Also, while offering video-processing specs of high quality, the player lacks video upsampling for HD displays or a DVI or HDMI video output, all of which are becoming de rigueur in video circles. Yet the exploitation of all of the UDP-1's audio capabilities pretty much demands the use of a video monitor —

components at the 60Hz line frequency and its harmonics. (The 60Hz and 180Hz components usually result from transformer hum injected into the audio circuitry; the 120Hz and 240Hz components result from suboptimal grounding within the player's chassis.) I experimented with various grounding arrangements between the UDP-1 and my Audio Precision System One, but could not reduce the power-supply noise below that shown in these graphs.

With its relatively noisy output, it came as no surprise that the McCormack offered a high amount of low-level linearity error with 16-bit data (fig.5) and didn't do a good job of preserving the waveform of an undithered sinewave at

![Fig.5 McCormack UDP-1, left-channel departure from linearity, 16-bit CD data (2dB/vertical div.).](image1)

![Fig.6 McCormack UDP-1, waveform of undithered 1kHz sinewave at -90.31dBFS, 16-bit CD data.](image2)

![Fig.7 McCormack UDP-1, spectrum of 1kHz sinewave, DC-1kHz, at 0dBFS into 4k ohms, DSD data (linear frequency scale).](image3)

![Fig.8 McCormack UDP-1, HF intermodulation spectrum, DC-25kHz, 19+20kHz at 0dBFS into 4k ohms, CD data (linear frequency scale).](image4)
the front display is unreadable from more than 2-3' away, and flashes "GUI" in response to most attempts to change tasks beyond what the front-panel push-buttons can do. Sure, you can remember a pushbutton sequence to make a change, but I think that's asking too much of the user.

**Stereo by default**

Despite requiring a video display to access its menus, the UDP-1 comes from the factory with two-channel stereo as its default mode for all formats. Any first-time user can just plug it in, turn it on, and enjoy two-channel CDs, SACDs, and DVD-As, as I did.

It was a revelation. Each time I popped in a familiar disc, I hoped to catch the UDP-1 out in some characteristic that would negatively distinguish it from what I've heard in the past. No such luck. The McCormack sounded as clean, balanced, and dynamic as all get-out. Violinist Andrew Manze's disc of Vivaldi concertos, *Concertos for the Emperor* (CD, Harmonia Mundi HMU 907332), sounded almost squeaky-clean, albeit endowed with a warm ambience and great depth. In fact, the advantage gained by switching to the SACD version (HMU 807332) was small, endowing the soundstage with only a little more detail while bringing Manze's solos into greater relief. Similarly, female voices and their accompanists, from Anna Netrebko on *Sempre Libera*, with Claudio Abbado and the Mahler Chamber Orchestra, (CD, DG B0002999-02), to Tierney Sutton backed by piano, bass, and drums on *Dancing in the Dark: Inspired by the Music of Frank Sinatra* (SACD, Telarc SACD-63952), provided ample evidence of the UDP-1's ability to open up the greater soundstage without compromising the soloist up front.

The UDP-1 even told me more than I had known about the harmonic richness of Wayne Horvitz's keyboards on *Forever*, one of my favorite DVD-As (Hi-Res Music CHRM 2001). One should never mistake the instrument on "Capricious Midnight" for a synthesizer, but with the McCormack feeding my system, I savored the flavored harmonics as never before. But I best appreciated the UDP-1's transparency and balance exactly —90.31dBFS (fig.6). Again, almost perfect performance with these two signals can be seen in this issue's dCS review.

Turning to the McCormack's distortion performance, a full-scale 1kHz tone was reproduced with low levels of low-order harmonics, even when driving fairly low impedances (fig.7). This is commendable performance. Intermodulation distortion was also very low (fig.8).

I tested the UDP-1's rejection of word-clock jitter using a diagnostic tone sampled at 44.1kHz, which I burned to both CD-R (16-bit data) and a DVD-A-formatted DVD-R (24-bit data). The measured amount of clock jitter, calculated by the Miller Audio Research Analyzer looking at the player's analog output, was low. CD data resulted in 231 picoseconds peak-peak of jitter; DVD data, 182ps. However, as the spectra of the UDP-1's analog output show, not only are there jitter components present (indicated with purple markers), but there are many noise spikes, as well as a noise floor about 6dB higher than the best CD playback I have examined. There are also data-related sidebands present with the CD signal (fig.9, red numerical markers), but these are absent as expected with the 24-bit DVD signal (fig.10). I don't have the special diagnostic test signal recorded on SACD, but analysis of a high-level tone at exactly one quarter the sample rate (not shown) gave a similar picture, with a highish, dirty-looking noise floor.

Having heard good things about the McCormack's sound quality from audiophiles whose opinions I respect, I was disappointed to find out that its intrinsic resolution is limited to the "Red Book" CD level. No matter how good a power supply McCormack has used, and how beefy an output analog stage it has added, the fundamental digital performance appears to be that of the OEM Pioneer circuitry at the player's heart. I am at a loss, therefore, to explain either why Kal liked the UDP-1's sound so much.

—John Atkinson
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with Yo Miles! Sky Garden, a two-channel-only, two-SACD set featuring guitarist Henry Kaiser and trumpeter Wadada Leo Smith's reinterpretations of and riffs on the music of Miles Davis and others (Cuneiform RUNE191/192). This studio production, recorded direct to DSD, offers some of the most immediate and realistic sound of both electronic and acoustic instruments. Listen, for example, to how Smith's acoustic trumpet soars over the thick electronic-bass base of "Sivac"> Gemini Double Image> Little Church," a sort of Davis-meets-Zawinul fest. The UDP-1 was both richly weighty and surgically revealing on this outstanding recording. Even feeding the CI layer through the Theta Gen.VIII didn't come close.

In level-matched A/B comparisons to the Sony XA-9000ES SACD player, even with the latter's alternate filter in use for CI, the UDP-1 offered an edge on CDs and SACDs that was just a bit softer. That difference was of small enough consequence to permit me to fully enjoy both players with the Revel Ultima Studio speakers, but it tilted my preference to the McCormack when I used the Paradigm Reference Studio/60s. In a similar A/B comparison, with CDs, of the McCormack's analog output with the output of the Theta Gen.VIII running off the UDP-1's coax digital output, there were no differences in balance or, indeed, in overall transparency and detail. But for the extra $11,000, the Gen.VIII did give me a wider, deeper, more convincing soundstage. And to show you how fast things change, I heard no advantage in piping the UDP-1's output through the Mark Levinson No.360S D/A processor — and no disadvantage, either.

Multichannel by design

In my multichannel system, the sound of the UDP-1 was as good as it had been in two channels: fast, clean, and balanced. The McCormack was my workhorse for auditioning all the new RCA Living Stereo and Mercury Living Presence SACDs, and it was simultaneously extremely revealing and eminently satisfying. For example, the higher levels of tape noise on the Mercury were immediately noticeable but relatively unobtrusive, permitting my ear-brain to readily adapt to them. On the other hand, the richness and solidity of the spectral balance and soundstage were almost mesmerizing.

Nor did the UDP-1 display any favoritism when I played my favorites. It performed equally well with SACD and DVD-A, as well as with DD and DTS soundtracks. So, while I still prefer Naxos' DVD-As to their parallel SACD releases, the UDP-1 improved the SACDs' playback while simultaneously delineating the differences between the formats. Listen to the inner voices in the chorus of Arvo Part's Magnificat, from his Berliner Messe (Naxos SACD 6.110052, DVD-A 8.110052) and you'll hear what I mean. The SACD is spacious and detailed, but the DVD-A has just that little extra transparency.

The UDP-1 was even better with SACDs from original DSD recordings, providing ample justification both for the higher resolution and for the multichannel format. Only the $11,000 Linn Unidisk 1.1 is able to speak with as consistent a voice across all music formats, and thus is as capable of fairly distinguishing between the two hi-rez formats. The UDP-1 also did a bang-up job with DD and DTS. The DVD-A of

TO SAY THAT I WAS HAPPY WITH THE PERFORMANCE OF THE MCCORMACK AUDIO UDP-1 IS AN UNDERSTATEMENT.

ASSOCIATED EQUIPMENT

**TWO-CHANNEL SYSTEM**

**DIGITAL SOURCES** Sony XA-9000ES SACD/CD player, Theta Gen.VIII DAC.

**PREAMPLIFIER** Sonic Frontiers Line-3.

**POWER AMPLIFIERS** Sonic Frontiers Power-3, Classe Omicron monoblocks.

**LOUDSPEAKERS** Revel Ultima Studio.


**MULTICHANNEL SYSTEM**

**DIGITAL SOURCES** Sony SACD-AX777ES SACD/CD player, Denon DV-5900 universal player.

**PREAMPLIFIER** McCormack MAP-1.

**POWER AMPLIFIER** Bryston 9B-STT.

**INTEGRATED AMPLIFIER** Linear Model 10.

**LOUDSPEAKERS** Paradigm Reference Studio/60 and Studio/20 (or Magnepan MGMC-1), Paradigm Servo-15 subwoofer.

**CABLES** Multichannel: Harmonic Technology Harmony Rainbow. Crystal Cable Cinemax. Interconnect: Alpha-Core Goertz Micro-Purl copper.

**SPEAKER** Kubala-Sosna Fascination.

**FILTRATION** AC: Kubala-Sosna Emotion.

—Kalman Rubinson

Simon Rattle and the Berlin Philharmonic's version of Mahler's Symphony 5 was more incisive via the UDP-1, but the Dolby Digital DVD-V of the same performance clearly qualified as high-resolution audio, with the added fillip of full-motion video. The Linn Unidisk 1.1, however, requires an external decoder for these formats. Junior Brown is one of my guilty pleasures. The UDP-1 delivered his gitty, resonant voice on Down Home Chrome with striking immediacy (SACD), Telarc SACD-63613). Where this album really scores over Brown's earlier CDs is in the fullness of his guitar and the weight and size of the backing combo.

My Denon DV-5900 universal did equally well with the bottom half of the Junior Brown SACD, but is just a bit grainy in the upper end in comparison to the McCormack. Similarly, the Denon, excellent though it is, doesn't delineate between the SACD and DVD-A versions of Naxos recordings quite as clearly. Perhaps an extra $1000 in mods would level the playing field!

**Conclusions**

To say that I was happy with the performance of the McCormack Audio UDP-1 is an understatement. The UDP-1 played SACD, DVD-A, and CD recordings, to say nothing of Dolby Digital and DTS, equally well, making the best of each. It is an easy recommendation to make to audiophiles whose video needs are not obsessive but who nonetheless have a video monitor for accessing McCormack's excellent and essential menus. Mated to McCormack's MAP-1 preamp, the UDP-1 universal disc player offers wide-range, uncumbered performance. The combination can stand comparison with anything on the market.
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World Radio History
Bohlender-Graebener Radia 520i loudspeaker

When I measured the Radia 520i loudspeaker for Larry Greenhill’s review in the December issue (p.115), I was bothered by the apparent unevenness of the 50” ribbon unit’s frequency response. This unit covers the region above 400Hz and its output was marred by roughly equal dips and peaks up to about 15kHz, above which it rolled off steeply. The microphone was placed 50” away from the speaker on an axis level with the midpoint of the ribbon for the quasi-anechoic measurement, and, as I wrote, this may well not have been far enough away to properly characterize the drive-unit’s behavior. (The inherent assumption when measuring a loudspeaker’s response is that the microphone is much farther away than the longest dimension of the speaker. With a 6’-tall speaker such as the Radia, that condition cannot realistically be met.)

I therefore set the review samples up in my own listening room, both for a weekend of auditioning and to carry out a spatially averaged response of the speakers’ output at the listening position. (I average 120 individual 1/3-octave response measurements for each speaker driven on its own in a grid 18” high and 36” wide centered on the position of my ears.)

The results are shown in fig.1. The blue trace is the quasi-anechoic farfield response published in the December review, taken with a calibrated DPA omni-directional microphone and DRA Labs’ MLSSA system. The peaks and dips mentioned earlier are readily apparent, though it should be noted that the energy excess at 125Hz is an artifact of the nearfield measurement technique used to generate the trace below 300Hz.

The red trace is the spatially averaged response in my room, which takes into consideration the reverberant field, which in turn depends on the speaker’s radiation pattern. (I used an AudioControl SA3050A spectrum analyzer, with its own calibrated microphone, for this measurement.) As Dr. Greenhill found, the speaker’s mid- and low-bass output is prematurely rolled off, though in a well-controlled manner. The 520i is thus a natural match for a subwoofer. The unevenness in the anechoic-on-axis curve can also be seen to smooth out, and the in-room response actually meets comfortably tight ±3dB limits from 125Hz to 7kHz. Above that frequency, the Radia 520i’s output falls off rapidly, pretty much mapping the anechoic curve.

Listening to the Radia’s, I was impressed both by the superbly defined, stable stereo imaging and by the smoothness of the sound. Bass was missing in action, but this was offset by the fact that there was no sense that the audioband was being covered by disparate drive-units. The integration between the twin 6.5” cone woofers and the ribbon was very well implemented.

However, while the suppressed top octave was not an issue for much of the time with both classical recordings and the usual overcooked modern rock discs, the lack of “air” in the Radia 520i’s balance did occasionally intrude on recordings with naturally balanced high frequencies, such as the chamber-music recordings on my Editor’s Choice CD (Stereophile STPH016-2). More important, I was sometimes bothered by a narrow band of brightness. This was audible, for example, as an added edge to the sounds of the solo voices on last September’s “Recording of the Month,” the Nikolaus Harnoncourt/Concertus Musicus Wien performance of Mozart’s Requiem (SACD, Deutsche Harmonia Mundi 82876 58705 2). This balance correlates with the presence-region dip and the slight excess of energy in the mid-treble in the in-room response, my ear latching on to the latter as brightness rather than on to the former as a lack of presence. The opposite could also happen: Eric Clapton’s Me and Mr. Johnson (CD, Reprise 48423-2) sounded too polite (though it must be said that Mr. C. does sound asleep at the wheel for much of this set).

Larry Greenhill summed up the Bohlender-Graebener Radia 520i as providing “clean, nonfatiguing sound, superb soundstaging that placed the instruments and voices with rock-solid stability, a wide dynamic range, and overall transparency.” I’d say he basically nailed it, though I would want more top-octave energy.

—John Atkinson

Graham Slee GSP Audio Era Gold Mk.V phono stage

At the end of his favorable review of Graham Slee’s GSP Audio Era Gold Mk.V phono stage (now $950) in January 2004, Michael Fremer exclaimed: “This is one budget piece Bob Reina has to hear.” Them’s fightin’ words, Mikey. Sure, as an analog guy, I’m game—most of the listening that transpires during my reviews of affordable speakers is to original pressings of 1950s and ’60s jazz LP’s and Acoustic Sounds and Classic vinyl reissues, all reproduced via my trusty front-end of Rega Planar 3 turntable, Syrinx PU-3 tonearm, and Clearaudio Virtuoso Wood cartridge. I called Fremer to borrow his Era Gold for a while to give a listen, but he refused to let it out of his house. Which, of course, made me want to hear it even more.

After considerable break-in and warmup time, the Era Gold Mk. V sounded fabulous on a series of reference LP’s. The midrange vocals on Janis Ian’s Breaking Silence (Analogue Pro-
ductions CAPP 027) were rich, detailed, and vibrant, without a trace of coloration, and there was excellent detail resolution in the high frequencies, with naturally clean but unexaggerated transients. Bass extension was forceful, clean, and tight, and dynamic range at both extremes was extended, linear, and natural. On orchestral works such as Messiah's Turangalila Symphony (EMI UK SLS 5117), all instruments were placed with considerable detail, body, and ambience on a wide, deep soundstage. Piano reproduction was particularly impressive in terms of detail, timbre, and transient articulation. Bass-drum reproduction was deep, forceful, and dynamic, without a trace of overhang. On Dean Peer's Utross (Jazz Planet JP 5002), Peer's electric bass was uncolored, fast, and articulate, and the lower register of his instrument shook the room.

I detected only a few flaws with the Era Gold Mk.V, and all of them were nits. I noticed, particularly on pop recordings, a very slight thickness in the upper bass that manifested itself on those tunes in which electric bass featured prominently in the mix. On classical recordings, the extreme upper registers of woodwind and percussion instruments seemed to lack a bit of top-end sparkle and air. Finally, when presented with highly modulated orchestral works such as the Messiah, the Era Gold's overall presentation was a bit tense in the upper midrange, but only during the hairiest passages.

I compared the Era Gold to two phono stages with which I'm familiar: the EAR 834P (now $995, reviewed by me in July 1997 and by MF in August 2003), and the MMSE phono board ($130) added to my Creek 5350SE integrated amplifier. Each of these comparisons comes with a caveat. First, the stock tubes of the EAR, which I'd borrowed from a friend, had been replaced with new old stock Telefunken 12AX7s. Normally, I don't like "tube rolling" during a review, but EAR's US distributor does recommend NOS Telefunkens as an upgrade, and the unit I used had arrived without the original tubes for comparison. Also, although the circuitry of my Creek phono board is similar to that of Creek's OBH-15 standalone phono stage ($450), it's not identical; the OBH-15's circuits are slightly more elaborate, and it has its own power supply.

The EAR exhibited more detail, air, delicacy, and body in the midrange than the Era Gold Mk.V, as well as more detailed and extended highs. The EAR's bass performance was a bit rounder and slower than the Era Gold's, but which is the more natural and realistic will be a matter of taste. The EAR's dynamics were also superb, but in high-level passages it exhibited none of the tenseness I heard with the Era Gold. (Although it had been many years since I'd had an EAR in-house, this sample of the 834P had not a trace of the overall dark character I'd noted in my review of the original unit back in July 1997. I speculate that the upgrade to the Telefunken tubes is the main cause of the difference.)

The Creek phono board also exhibited a beautifully colorless midrange with excellent resolution of detail. The high frequencies were more extended than the Era Gold's, with transients that were even more refined. The bass seemed cleaner than both the Era Gold and the EAR, but low-bass extension and high-level dynamic slammed seemed superior on the other two phono stages.

Mikey was right—Graham Slee's GSP Audio Era Gold Mk.V is a pip! I was very impressed with its performance, as well as with those of the EAR 834P (with tube upgrade) and the Creek phono board. All are highly recommended, depending on your taste and budget.

—Robert J. Reina

Doppler and DiAural

When I wrote the "Doppler and DiAural" sidebar for my recent feature about Doppler distortion in loudspeakers ("Red Shift," November 2004, p.67), I fully expected a retort from DiAural's founder Ray Kimber, of Kimber Cable. In the event, both he and Eric Alexander, the originator of DiAural's crossover design concept, took up their pens to point out to me that the Doppler decoding explanation was still current was the continued citation—and, in one case, linking—on DiAural's website of press articles repeating the Doppler claim, without any cautionary note to the effect that it had since been rescinded. Promptly and, I thought, in a very gentlemanly way, Kimber conceded this point and immediately set in train changes to the website that will prevent it from, in the future, promulgating this discredited explanation of DiAural's sonic effect. (Which, as I won't need to remind Stereophile readers of long standing, earned the launch of DiAural enthusiastic column-inches in much of the audio media.)

Eric Alexander has assured me that he has never developed a crossover topology that was intended to eliminate Doppler artifacts, which reinforces my observation in "Doppler and DiAural" that DiAural's two patents, which cite Alexander as the inventor, make no mention of Doppler distortion in their texts. Doppler decoding, it seems, was merely an attempt to explain the sonic benefits of DiAural, and so came after the event, not before.

—Keith Howard

Paradigm Reference Studio/100 v.3 loudspeaker

Like the Reference Studio/60, which was enthusiastically reviewed in the December 2004 issue by Kalman Rubinson, Paradigm's floorstanding Reference Studio/100 is now available in a v.3 version.4 The '100 is the flagship model in the Canadian manufacturer's Reference line. Its earlier incarnations, the original Studio/100 and the '100 v.2, were reviewed by Tom Norton and Robert Deutsch in the August 1997 and June 2000 issues of Stereophile, respectively—you can find the Web reprint of the latter at www.stereophile.com/loudspeakervews/252—and both writers were

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well impressed at how much sound quality could be wrought from a competitively priced speaker design. Bob Deutsch, in particular, referred to the v.2 as a "serious high-end contender, and a formidable one for just about any speaker in its price range and even well above."

Not surprisingly, following its first review, the Studio/100 took up long-term residence in Stereophile's "Recommended Components" listing. When I heard that Paradigm had introduced a v.3, I asked for review samples.

Like the earlier version, the v.3 is a reflex-loaded, three-way design, though it features three 7" woofers compared with the v.2's twin 8.5" units, which allows a narrower cabinet to be used (8.25" vs 11"), with all the benefits that confers on both enclosure rigidity and upper-midrange radiation pattern. The midrange unit still uses a mica-filled polymer cone, but this is now a 7" unit rather than a 6.5", with a stationary metal phase plug rather than a dustcap. The 1" aluminum-dome tweeter looks very similar, but its housing now protrudes slightly above the top of the enclosure—a nice styling feature, in combination with its rubber-covered top. All of the drive-units are manufactured by Paradigm.

The Studio/100 v.3 looks very attractive with its drivers exposed, but, as with all Paradigm designs, the black cloth-over-plastic-frame grille provides the necessary smooth baffle profile in the vicinity of the diaphragms to optimize the speaker's dispersion. The '100 is therefore intended to be listened to with its grille on; omitting it results in both a less-even frequency response and some dips and peaks appearing in the treble response.

Listening: I used the Studio/100s for six weeks or so of serious listening, first in a system comprising Ayre CX-7 and Simaudio Moon Equinox CD players driving a Mark Levinson No.380S preamplifier and No.33H monoblocks, with AudioQuest and Madrigal cables, then with a fully loaded dCS digital front-end—Verdi SACD/CD transport, Purcell upsampler, Elgar Plus DAC, Verona master clock—driving the No.33Hs directly.

First disc played was the CD layer of the original LP version occupied pride of place in my collection. The Studio/100s coped equally as well with Brian Wilson's Presence 470 639-2), the speakers' rich but clean low dynamics, well-recorded classical music, a well-mastered SACD is about as good a source as I can imagine anyone wanting.

Turning to well-recorded rock—which often means reaching back in time—the Paradigms coped well with the demands of the side 2 suite on Pink Floyd's Dark Side of the Moon (SACD, Capital CDP 5 82136 2), taking me back to my early audiophile days in the 1970s, when the original LP version occupied pride of place in my collection. The Studio/100s coped equally as well with Brian Wilson's re-creation of SMILE (CD, Nonesuch 79846-2), the speakers' rich but clean low frequencies underpinning the complex mixes. (Though as transparent as the Paradigms' high frequencies were, I still couldn't make out the words of the answering phrases in the verse of "Surf's Up"—I have been singing "wipe out, wipe out" for the past 30 years, but the new recording only goes as far as revealing that I have been wrong to do that.)

I haven't said anything about coloration. That's because, despite the variety of program material I auditioned on the Studio/100s, I was never made aware of any persistent problem in this area. This is one neutral speaker.

Measuring: I performed a full set of measurements on the Studio/100 v.3, which will be found on the Web reprint of this "Follow-Up." The voltage sensitivity is above average, at an estimated 85.5dB/2.83V/m, which is within the margin of error of the earlier v.2's measured sensitivity of 89.5dB. The speaker's impedance plot (fig.1) reveals it still to be quite a demanding load, however, with
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a magnitude that drops to 2.5 ohms at 104Hz. The enclosure was well-braced and damped. The only resonant mode I could find on its panels lay at quite a high frequency of 425Hz. This was well down in level except on the back panel, where its effect on sound quality will be reduced.

The saddle around 20Hz in the impedance magnitude trace implies a low tuning frequency for the 3" diameter port on the front panel, under the woofers. This was confirmed by the nearfield measurement of the woofers' and port's outputs (fig.2, blue and green traces, respectively). The woofers' minimum-motion point actually lies just below 20Hz, though the port output covers a broader-than-expected bandpass, extending up through the midbass. I plotted the outputs in this graph in the ratio of the square roots of the radiating areas, which results in the woofers' output appearing a little boosted in the upper bass compared with the midrange unit (fig.2, red trace), which rolls off at 18dB/octave below 200Hz.

The speaker's upper-frequency response is very flat on-axis in the midrange and low-middle treble, as is the overall output averaged across a 30° horizontal window on the tweeter axis (fig.3, red trace). The Studio/100's upper-bass output is still a little boosted in this graph, but this will subjectively balance the slightly elevated top octave. For reference, I plotted the response of the '100 v.2 in blue in fig.3; despite their different drive-unit lineups and enclosures, the two speakers are very similar, suggesting a consistent engineering vision at Paradigm.

The v.2 Studio/100 had rather an uneven horizontal radiation pattern (see the June 2000 issue, p.67, fig.6), but the v.3 was better behaved in this respect. Its dispersion was even and uniform, with the on-axis dip at 12kHz filling in to the speaker's sides. The speaker was also uncritical regarding vertical listening axis. Fig.4, produced by averaging 120 Vs-octave spectra taken for each speaker individually in a grid centered on the position of my ears, shows how this all came together in my listening room. The upper bass is still boosted a little, as are the mid- and high-treble regions. Alternatively, if the ear takes these regions as their reference, the midrange and low treble could be perceived as being slightly recessed, which is more the balance I heard in my auditioning. The low port-tuning frequency results in useful output down to the bottom of the audioband.

In the time domain, the Studio/100's step response indicates that the tweeter and midrange are connected in inverted acoustic polarity, the woofers in positive polarity. When you take into account the phase shift due to the crossover filters and the physical displacement of the diaphragms, this results in the excellent drive-unit integration seen in the frequency domain. The waterfall plot is much better than that of the earlier versions of the '100, with a clean decay free of resonance and reflection through the mid- and treble regions of the audible range.

Summing up: At $2300/pair, the Paradigm Reference Studio/100 v.3 offers superb performance with a clean, neutrally balanced presentation and powerful low frequencies. Its lowish impedance will require some care taken with choosing an amplifier or receiver, but set against that will be its above-average sensitivity. This is a true full-range audiophile loudspeaker at a much lower price than you'd expect to pay for a similar design from a boutique brand. Highly recommended.

— John Atkinson
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In the wrong hands, the sonatas can be a bit too slow and a bit too serious, their lighter lines and more melodic moments sacrificed on the altar of right and proper Ludwig van Gravitas. One of the quirks of the five cello sonatas is that they were written over a span of nearly 20 years: the first two in 1796, No.3 Op. 69 in 1807–8 (just after Symphony 5), and the final pair in 1815. Over this time Beethoven underwent enormous physical and emotional changes, some of which are reflected in the sonatas. This set is filled out with the relatively obscure Sonata in F, Op.17, originally written for horn, as well as better-known sets of variations on themes by Mozart and Handel. And in most cases with complete Sonata recordings there are also the two engaging variations on Magic Flute themes by Mozart and the less interesting variation on a theme by Handel.

While there’s plenty of empty space and enough darkness in this performance of the G-minor sonata, Op.5 No.2, for those who want that sort of counterbalance, Schif effortlessly brings out the lighter colors with just the right light touch to offset the deep timbres of Perényi’s singing cello. In the Allegro, the pair’s shared rhythmic bounce, as well as their rising and falling lines, together and apart, are breathtaking, and evidence again that these players came to these works with fresh energies. The final pair of sonatas, written long after the composer’s hearing loss had become severe but before his brother died in November 1815, are nevertheless tinged with an obvious sadness that often provides the acid test of the emotional depths reachable by any given pairing of cellist and pianist. As with all ECM recordings, the sound is full-range, crisp and defined — the sonorities of the cello have rarely been this well recorded. The balance between the instruments and their placements on the soundstage are flawless.

Given the long and sublime recorded history of these sonatas, it’s hard to judge where this set will fit. After an exhaustive bout of A/B comparisons, they seemed to me sprightlier, more open to emotional depths reachable by any given pairing of cellist and pianist.
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We are told often that Janáček's operas are so closely linked with the rhythms of Czech that they can't truly be appreciated unless Czech is the language in which they're being performed. This new recording in a good, singable English translation by Edward Downes and Otakar Kraus, based on live performances with the Welsh National Opera, gives the lie to that theory. The preferred recording of this work has always been the one on Decca with Elisabeth Söderstrom in the title role, led by Janáček specialist Sir Charles Mackerras; this new one, not so coincidentally also conducted by Mackerras, now walks away with the honors. A good deal of the text is understandable (how much of the Czech would you have understood?), and the timings of the two sets are almost identical, but this new one has an urgency and an immediacy that keep the listener on the edge of his seat.

The recording certainly helps. It slightly favors the orchestra, allowing Janáček's sometimes hair-raising, sometimes delicate instrumental textures to be heard: The xylophone figures that always foreshadow trouble for Jenůfa, and which can 'feel' like the rattling of bones, deliver a chill each time they occur; the raucousness of the orchestra as Steva and his friends enter, drunk, is not good, clean fun, but the kind of fun that can turn violent if one guy has one too many. The tender accompaniment to Jenůfa's prayer in Act II is heavenly, and the berserk commotion you have understood), and the timings of the two sets are almost identical, but this new one has an urgency and an immediacy that keep the listener on the edge of his seat.

The recording certainly helps. It slightly favors the orchestra, allowing Janáček's sometimes hair-raising, sometimes delicate instrumental textures to be heard: The xylophone figures that always foreshadow trouble for Jenůfa, and which can 'feel' like the rattling of bones, deliver a chill each time they occur; the raucousness of the orchestra as Steva and his friends enter, drunk, is not good, clean fun, but the kind of fun that can turn violent if one guy has one too many. The tender accompaniment to Jenůfa's prayer in Act II is heavenly, and the berserk commotion that occurs when the dead infant is discovered is almost too real-

But it is also the natural interaction of the singers that adds to the performance's intensity. Mackerras refuses to let the tension drop for a moment and propels the action forward inexorably; it seems to be happening in real time. And the vocal performances are first-rate. Janice Watson's Jenůfa is glowing; she is expressive at all times and gives us a truly moving picture of this misused, loving, sad, and forgiving character. She sounds younger than Söderstrom (a definite plus), and her reading is on a par with Karita Mattila's on Erato.

Equaling her achievement is Dame Josephine Barstow, who sings the complicated role of Kostelnicka, the grandmother who, out of a misplaced sense of pride and honor, murders Jenůfa's baby. She is authoritarian and frightening, tormented, paranoid, and guilty, and when, in the final act, she begs Jenůfa's forgiveness, we see a woman who has fallen completely to pieces. The energy of singer-songwriter Marty Balin and cofounder Paul Kantner, had arrived at a perfectly balanced lineup steeped in folk, blues, and soul songwriting and powered by two improvi-

---

Robert Levine
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World Audio History
sational instrumental geniuses, guitarist Jorma Kaukonen and bassist Jack Casady.

Kaukonen had it all — with a terrific grounding in folk and blues roots, he was a great fingerpicker with an advanced understanding of chord structures and harmonic fills who had assimilated the breakthrough lessons of dynamics and technological interface demonstrated by the various guitarists in the experimental British blues-rock band the Yardbirds. Casady played bass as no one had ever heard it played before, laying redwood trunks of sustained notes across the arrangements with an inherent understanding of funk syncopation. Kaukonen and Casady exchanged a heady improvisational interlacing that set a template that jam bands still follow today. The remastering of these discs highlights the burnished nuances of this instrumental interplay.

The band is fully realized on *Takes Off*, with Balin's Jackie Wilson–like alto vocals countered by blues belter Signe Anderson, a woman who sang in a slightly lower register. The reissue, with nearly an entire album's worth of extra material, shows the band playing to all of its strengths. The extra tracks include the 1960s classic "High Flying Bird," "Runnin' Round This World," "It's Alright," and a hair-raising 10:36 jam version of "And I Like It" that gives an accurate picture of what the group sounded like live.

It's not until the second album, *Surrealistic Pillow*, that Grace Slick enters the band as Signe Anderson's replacement, but the two songs she brought with her from the band she'd been singing with, The Great Society, became the best-known hits of the Airplane's career: "Somebody to Love" and "White Rabbit." These add-ons like alto vocals countered by blues belter Signe Anderson, a woman who sang in a slightly lower register. The reissue, with nearly an entire album's worth of extra material, shows the band playing to all of its strengths. The extra tracks include the 1960s classic "High Flying Bird," "Runnin' Round This World," "It's Alright," and a hair-raising 10:36 jam version of "And I Like It" that gives an accurate picture of what the group sounded like live.

The Kaukonen-Casady interface was finally presented in all of its glory on *Bless Its Pointed Little Head*, one of the greatest live rock albums. These tracks, recorded in October and November 1968 at the Fillmores West and East, document the band's live glory — "3/4 of a Mile in Ten Seconds" and "Somebody to Love" sizzle with intensity and improvisational fury in dramatic contrast to the studio versions, and "Fat Angel" is a sublime jam that includes some of Kaukonen's finest work. The remastered version includes three songs from the Fillmore West show intended for the original release but cut due to the time limitations of the LP: "Today," "Watch Her Ride," and "Won't You Try." These additions allow JA fans to finally hear this album as it was originally meant to be heard.

The classic lineup's final triumph, *Volunteers*, recorded in the band's hometown of San Francisco in the spring and summer of 1969, summarized the hopes and fears of a generation that was witnessing the moon landing and the escalation of the Vietnam war simultaneously. The twin anthems that framed the original release, "We Can Be Together" and "Volunteers," became the soundtrack for the November 15 March on Washington in protest of the war. The remastered version includes five live tracks from the Fillmore East recorded two weeks later, including great versions of Kaukonen's take on the traditional "Good Shepherd" and the post-apocalypse classic "Wooden Ships," by David Crosby, Stephen Stills, and Kantner. The set fittingly ends on a stirring live rendition of "Volunteers."

--John Swenson

**MARAH**

**20,000 Streets Under the Sky**


In 2000, rough-and-tumble Philadelphia pop combo Marah titled their second album *Kids in Philly*. Given the critical hosannas, it seemed as if the group was on the verge of a commercial breakthrough. Then came a disastrous stab at mainstream rock, 2002's *Float Away with the Friday Night Rock Gods*, recorded in Wales with Oasis' producer, that served only to alienate the group's core fan base. Now, having returned to the source of their early inspiration, founding members Dave and Serge Bielanko and a revolving cast of players have penned their second love letter to their hometown.

Divided into an "East Side" and a "West Side," 20,000 Streets *Under the Sky* is an ambitious song cycle chronicling the sights, smells, and sounds of the 20,000-odd boulevards of the City of Brotherly Love. A few of the 11 songs tend to overreach, primarily those found in the album's slicker first half. The discoish "Going Through the Motions" proves that young white rockers should steer clear of funk, and if the overblown "Tame the Tiger" is intended as an homage to soul music, a similar caution is in order. Far better is "Freedom Park," a glammy, hammy wet-kiss to classic pop, with overtones of Kiss, Bowie, and AM radio-era bubblegum groups. And once Marah is safely back on familiar turf, nary a misstep is made: "Pigeon Heart" is pure early Springsteen, crash-landing on E Street and ready to party, while the anthemic ballad "Body" nods at latter-day Tom Petty & the Heartbreakers. Marah hasn't completely regained the ground lost during the *Float Away* debacle — *Streets* is no *Kids in Philly II*. Still, it's a strong enough effort to bring lapsed fans back to the fold while increasing the Bielanko brothers' chances of eventually grabbing that ever-elusive brass ring they so clearly covet.

--Fred Mills
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ZIGABOO MODELISTE
I'm On the Right Track

Performance ****
Sonus ****

Joseph "Zigaboo" Modeliste is the godfather of New Orleans funk drumming, an essential part of the driving force behind the phenomenally influential sound of the Meters. Over the past few years Modeliste has also led his own extremely hot live band, which unfortunately wasn't recorded properly on the hit-and-miss Zigaboo.Com.

This time, everything clicks; I'm On the Right Track captures the band's sound perfectly and provides a platform for Modeliste's crisp, straight-ahead drum sound on a strong collection of catchy, melodically strong tunes.

Modeliste's singing is not his strong point, but he minimizes the problem by using simple lines and a strong backup chorus. Opening with a sassy statement of purpose, "Welcome to New Orleans," Modeliste holds down the pocket with his tart drumming as he shouts with joy, picking up a little vocal and keyboard help from Dr. John. The Doctor also chips in on the shifty "Phat Too's Day," and Ivan Neville adds his funk keyboard touch to the sweaty "Sugar Pants." Another New Orleans icon, David Torkanowsky, adds keyboards to "Love Trying to Get a Hold on Me." Modeliste gets another high-profile keyboard assist from Bernie Worrell, on the definitively bootylicious antiviolence remonstrance "Guns," a sly way to bring a little social responsibility to the party.

Modeliste's dry, precise drumming keeps everything moving along at a toe-tapping clip, but the album's success lies in the infectious Meters-like writing he conjures on tunes like "I Like It Like That," "Watch It Baby," "Positive," and "Rollin' Stone."

The band sound on the record is perfectly matched to the material. The superbly written songs are anchored by the core group of guitarists Kai Eckhardt, and John Lee Sanders on tenor sax, keyboards, and vocals. —John Swenson

THE POLYPHONIC SPEERE
Together We're Heavy

Performance ***
Sonus ****½

The Polyphonic Spree is the most polarizing, head-scratching concept to come out of Dallas since the single-bullet theory. If your glass is half full, the group — two dozen or so musicians and singers who dress in choir robes and spew more preacherly sermons than the latter's innovation. In "AvsCo10," loud, distorted guitars and a straightforward beat go a band that ended with the death of guitarist Wes Berggren in 1999) raids the candy store accordingly, embellishing his pristine mixed sounds with the kind of instruments — chimes, harp, flute, heraldic trumpets, sawing strings — that hit the sweet spot again and again. Voices are repeatedly raised in unison to sing about sunshine and seeing the light, and crescendos pile atop crescendos.

The problem with going over the top so often, of course, is that eventually there's no more top to go over. Midway through the album, you just may feel exhausted by the spectacle of it all.

So it's ironic that some of the most affecting moments on Together We're Heavy are the smaller, quieter ones. DeLaughter — whose earnest, almost squeaky voice is akin to that of the Flaming Lips' Wayne Coyne — sounds most expressive on tracks such as "One Man Show," where he sings soberly atop a spare piano. The album-closing title track, a wordless wash of treated guitar and Theremin, is a welcome comedown. And that's the funny thing about an album whose sole purpose is to inspire joy and celebration: It can leave you yearning for some melancholy.

—Matthew Frisch

SEACHANGE
Lay of the Land

Performance 3½
Sonus 3½

If, on first listen, Lay of the Land, the first full-length album from UK sextet Seachange, seems disjointed and a bit schizophrenic, it later proves itself to be full of guts and ambition. Despite its scope — the album vacillates from the new wave/disco-punk "News from Nowhere" to the slow-building shoegazer anthem "Glitterball" to the garage-punk revivalist "SF" — Seachange is able to meld these elements in only a few brief but very worthwhile moments. And although the group doesn't always bring their many influences together in the most efficient way, they've managed to create an album that not only demonstrates their versatility and raw power, but even hints at potential greatness.

At their weakest, Seachange come off as a slightly more substantial version of Austin's... And You Will Know Us By the Trail of Dead, a dysfunctional marriage of U2 and Sonic Youth, minus the former's pop sensibilities and the latter's innovation. In "AvsCo10," loud, distorted guitars and a straightforward beat go
nowhere. The band ends the song quickly and re-enters with "The Nightwatch" and its melancholy violin solo, as if they know they've gone off track and are now apologizing. "The Nightwatch" is Seachange at their apex. Johanna Woodnutt's violins are allowed to lead the song structure, while Dave Gray and Adam Cormack's dueling, angular guitars shoot out simple laser-beam-like riffs, and ever-shifting rhythms courtesy of James Vyner on bass and Simon Aldcroft on drums bend around vocalist Dan Eastop's searching lyrics: "Hey, that's funny, look at me I'm laughing, laughing / Bent over backwards for you, smiling, keep smiling."

In these moments, Seachange is kin to Arab Strap — post-folk with punch — yet much less forlorn, replacing Arab Strap's drunken ramble with an urgent cry. "No Questions" is another standout, violins and guitars taking turns at the front, dancing wildly while maintaining balance, Eastop singing "She looks at me as if in the middle of a kiss / Stillness after a gentle fit." Perhaps in these lines, Eastop has unwittingly revealed the secret of and challenge to his band's potential. If they could consistently strike that balance between their stillnesses and their fits, Seachange might find themselves among indie rock's upper class.

For a band that seems to revel in the amount of noise they can make, Seachange are at their finest when they focus on allowing themselves to be quiet. The album ends with an acoustic ballad in a loose and simple arrangement, Eastop sounding hopeful: "We can find a quiet place / Out here, where the soil is good." The listener is left echoing the lines, hopeful, too, that Seachange will find what they're looking for.

— Stephen Mejias

TOMMY STINSON

Village Gorilla Head

Performance ***
Sonics ****

It's probably fair to say that, since the Replacements broke up in 1991, sightings of bassist Tommy Stinson haven't kept the paparazzi up at night. Neither of Stinson's later groups, Bash & Pop and Perfect, did much more than prove that, yes, he has talent as a bandleader, but no more than a zillion other musicians. And take his 1997 appearance on Puff Daddy's "It's All About the Benjamins" — please.

Since 1998, Stinson has been a member of Guns N' Roses, not exactly a high-profile gig. Yet around that same time he also began hatching what would turn into his solo debut proper. A six-year marinating process may seem ridiculously protracted, but Village Gorilla Head is, ultimately, a winning and stylistically diverse affair featuring moody ballads, churning power pop, punk-fueled glam (Bowie and Cheap Trick are obvious influences), and no shortage of Replacements-styled rockers. One obvious standout, speaking of the 'mats, is "Something's Wrong," which boasts an infectious riff Keith Richards could covet, an anthemic melody, and a trashy, boozy, bar-band vibe — all despite its being polished to studio perfection; no one's gonna mistake this record for an artifact from an earlier era.

Stinson's previously overlooked gifts as songwriter and arranger are part of the story here too. Assisted by musicians culled from the ranks of Perfect, GN'R, A Perfect Circle, and others, Stinson achieves a room-filling sound, at times dauntingly dense and layered with all manner of instruments (cellos, keyboards, sax, female backing vocals), at others airy and delicate — "a thoroughly modern rock record," though not in the superficial sense of the term.

On the downside is Stinson's overreliance on a vocal style that could charitably be described as a forced, Dylan-esque nasal drawl; he's at his best when he dips into a lower register or is accompanied by harmony vocals. In the end, though, Stinson has come up with a solid collection far stronger than anyone might reasonably have expected.

— Fred Mills

ALBERT AYLER

Holy Ghost

Albert Ayler, soprano, alto, tenor sax, vocals; Jimmy Lyons, unknown, alto sax; Sam Rivers, Pharoah Sanders, Frank Smith, Frank Wright, unknown, tenor sax; Don Cherry, cornet; Don Ayler, Chris Capers,
Nothing exceeds like excess. It's wisdom not lost on Revenant Records, the over-the-top archival label that specializes in definitive compilations of artists whose work shimmers outside the frames of convention — "raw musics" is what its late founder, John Fahey, called it. And after recent, exhaustively detailed boxed sets devoted to such American originals as Charley Patton and Captain Beefheart, Revenant has found its ultimate subject: the titanic tenor saxophonist Albert Ayler. The square root of skronk, Ayler barreled through the 1960s, a forceful and singular figure even within the revolutionary context of the free jazz. Beginning in 1962, when he left the Army, and ending in 1970, when his body was found floating in the East River, Ayler epitomized jazz as unfettered, ecstatic expression. 

Across nine CDs and a brief bonus disc, Holy Ghost illuminates Ayler's creative life as a series of passionate excursions. Laid out as a crazy quilt of amateur-taped concert recordings, European radio broadcasts, and other ephemera documenting a dozen different performances and several interviews, the package is swollen with historical significance. Ayler was distinguished by many things, including a penchant for green leather suits and cosmic pontifications, but his importance as a musician often has been overlooked. Despite inventing an enduring template for collective jazz improvisation and staking a claim on a whole range of harmonic phenomena on the reeds, he's never been invited into the canon; instead, he's become the patron saint of jazz rebels, cited by the burliest saxophonists as their Godhead.

Yet Holy Ghost proves that Ayler commanded much more than...
the Vibraphone That Ate Cleveland (his hometown). Though he was the most extravagantly "out" saxophonist of his day, pushing even John Coltrane toward late-career epiphanies, Ayler forged a sound that drew explicitly from jazz's most traditional elements. His compositions pulsed with the polyphony of New Orleans parade music, whether exultant or dirge-like, and evoked the primal shouts of holy-roller gospel services, which also inspired the Pentecostal themes of his melodies, which bore such titles as "Saints," "Spirts," "Ghosts," and "The Truth Is Marching In."

The same can be said for this boxed set. Though not for strict audiophiles, the recordings sound miraculously good, given the dodgy nature of much of the source material, such as the mystery tape of Ayler blasting out "Love Cry" at John Coltrane's funeral. The packaging is prime: CDs in vellum slipcovers, housed in a faux-onyx "spirit box," with facsimiles of such artifacts as Tlw tigative reportage as well, nailing the history while leaving the mystery intact.

— Steve Dollar
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Bohlender-Graebener Radia 520i

Editor:
We at BG want to thank Larry Greenhill and John Atkinson for taking the time and effort to review our Radia 520i loudspeaker in December, and we are pleased with the comments and analysis that Stereophile has printed. We would like to take the opportunity to comment on several issues that John Atkinson recognized during his measurement session.

First of all, it's a pleasure to see an audio-magazine editor who is so familiar with all of the profound aspects of loudspeaker theory. Indeed, there are few things as complex as measuring a line-source speaker — especially a dipole. While testing a line-source speaker, trying to determine the right conditions, getting meaningful results, and interpreting them correctly are far from trivial. In our experience, it is very difficult or even impossible to fully comprehend and find correlation between the listening experience and the expected speaker performance based on the analysis of nearfield measurements.

In the case of line-source speakers (large planar magnetic, ribbon, and electrostatic designs, and some discrete line arrays), a listener is almost always located within the speaker's nearfield. Established acoustical theories explain how a speaker's frequency response changes with distance in its nearfield. Therefore, for a long line source, results obtained at 50° will not fully represent what we would hear at 10°-12°.

Moreover, the farther one is located from a line source, the more constructive interference occurs at higher frequencies, the more coherent is high-frequency output, and thus more high-frequency SPL is generated. This is the reason a line-source system's nearfield SPL drops off at -3dB per doubling of distance — only half of the -6dB rate of a conventional point-source system. Ideally, if one wants to determine a spectral balance of the line source speaker's direct sound, such a speaker should be measured in an anechoic chamber at the intended listening distance. If one were to measure the Radia 520i at 10°-12° in an anechoic chamber, one would see a significantly different response from the results measured at 50°. Specifically, the high-frequency output would be much smoother and higher in level relative to mid- and low-frequency output.

However, such practice would not, in our opinion, be fully productive in the case of a Radia 520i dipole line source, and may lead away from understanding the real-world results. We listen to speakers in rooms that are semireverberant. A line-source dipole speaker in such a room generates a soundfield quite different from its anechoic response, with multiple reflections due to strong rear radiation. These reflections create a diffuse soundfield that is superimposed on the direct sound and changes the subjective perception of the spectral balance. While one can fairly judge a conventional direct-radiating speaker from an examination of its anechoic direct sound response, a dipole line-source system cannot be assessed in such way. Such a system's performance would significantly depend on its room reflections, which in this case are inseparable components of the whole experience.

The discussion above is meant to confirm John Atkinson's thought that testing such a speaker as the Radia 520i is a very difficult and complex process. The Radia 520i is a loudspeaker that, more than many other designs, requires a very careful combination of nontrivial measurements and critical listening in order to obtain more or less repeatable and meaningful results. That's what we constantly do at BG when in the process of developing such product.

We appreciate very much that Mr. Atkinson, recognizing all these critical aspects, agreed to take more time and follow up with more listening to the Radia 520i to finalize his judgment.

Igor Lewitsky
VP of Engineering, Bohlender-Graebener Corporation

Balanced Audio Technology

We would like to thank Michael Fremer for his superlative writeup of our reference VK-P105E Super Pak tube phono preamplifier in this issue's "Analog Corner." Michael's wealth of experience with equipment in the upper echelon of the analog marketplace makes his comments very special indeed! In this context, it is very gratifying to read that "The BAT VK-P105E is one of the top three phono preamplifiers I've heard. In many ways it comes in No.2, after the Boulder 2008 and before the Manley Steelhead."

It is also revealing that Michael wrote much of his review based on the performance of the VK-P105E Super Pak in single-ended mode. We believe that the performance jumps to yet another level with a balanced connection (once all variables are equalized).

With regard to the high-performance Lundahl step-up transformers, all models of the VK-P10, starting with November 2004 production, will incorporate these better parts. Finally, as part of Balanced Audio Technology's effort to provide an upgrade path for our customers, all VK-P10 and VK-P105E models can be fully upgraded to the VK-P105E Super Pak.

Thanks again, Michael. We agree! "Vinyl rules!"
Steve Bohnarski, Geoff Poor, Victor Khomenko
Balanced Audio Technology

Sonus Faber Stradivari Homage

Editor:
The Stradivari Homage represents the sum of a very special man's lifetime. In the years I have known Franco Serbini, he has never been anything but gracious, humble, and generous with his time. Piercing and inquisitive, brilliant, driven, never fully satisfied but always warm and supportive, he is the very definition of a gentle man.

We ask much of reviewers, we designers. Michael Fremer has met the test — fully, I might add. In the end, what we hope is that the reviewer grasps the core ethos of the design, that they understand what it is that is being attempted. When MF writes that the Strad is "the most emotionally communicative speaker I've ever heard," he does exactly that. Thank you.

Two small points of clarification: I must confess that when Patrick and I first saw Michael's room and its modest though reasonable dimensions, we had a brief flicker of self-doubt. Yet we have come to understand that one of the advantages of Franco's approach yields a speaker that drives a room better and more evenly — especially in the deep bass, from which we deduce aural scale and size signatures — than any we've ever worked with. As further emphasis of this point, Michael was apparently able to glean the speaker's basic character in two rooms of vastly different proportions and constructions.

And so, with the speakers a couple of feet farther apart to open up the inner workings of the soundstage, and a foot and a half or so farther into the room to allow the low bass to "breathe," we had a perfectly wonderful sound. I mention
this because the new Stradivari Homage owner will, in most instances, be able to enjoy this level of service from a Sumiko person trained in the art of Masters setup. We completely concur with Michael’s impressions of the overall voicing of this system being full and rich in balance. As always, the speaker is at the mercy of or is the beneficiary of the components preceding it. If greater speed or a higher sense of resolution is desired, there are combinations of partnering electronics, for example, that can emphasize this aspect.

John Hunter
President, Sumiko

Amphion Helium²
Editor:
We would like to thank Robert J. Reina for his insightful comments on the Amphion Helium² speakers. We appreciate his consistent and methodical approach to reviewing. And of course we are pleased with how the Helium² fared in his affordable-speaker forum, but more important, we are pleased with Robert’s assessment of the Helium² in the larger context of loudspeakers in general. Classics and benchmarks are hard to come by in the “been there, done that, got the T-shirt” world of high-end audio, and we appreciate Robert’s label of the Helium² as both a "classic" and "a new benchmark."

Two points of clarification should be addressed. Amphion does use the low crossover point of 1.5kHz, but they have identified the critical hearing range to lie between 2kHz and 5kHz. (See http://hyperphysics.phyastr.gsu.edu/hb asc/sound/maxsens.html for further supporting information.) This is an important distinction, as most other companies never venture lower than 2.5kHz for this type of design. Additionally, Amphion loudspeakers do show very similar behavior in both anechoic chambers and real listening rooms in their larger models, where their U/D/D technology is useful all the way down to 300Hz. However, in the case of the Helium², the waveguide is effective in smoothing off-axis response down to the 1.5kHz point, but does not remove potential room-behavior issues the way the floorstanding Creon² and Xenon² can.

There is a point about setup that I would like to address that John Atkinson alluded to in his measurement data. The Helium² should be listened to on a taller stand than those with which many small speakers might normally be partnered. The Helium² is a true point-source design. As such, the acoustic center of the Helium² is located midway between the woofer center and the tweeter center, and disperses perpendicularly to the front baffle. As such, the speaker should be listened to with that point at or near ear level, with adjustments in the rake angle to accommodate for different listening-chair and speaker-stand heights. For further information on recommended setup tips for the Helium², please contact Quartet Marketing Group.

Again, thank you to Robert for his comments.

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remember when noise had nothing but bad connotations: dogs howling at 4am, a neighbor's stereo thumping through the wall, a particularly grating piece of "new" atonal classical music.

Then there's that peculiar din only unsupervised, sugar-stuffed children are capable of raising. Last year, reporter Rick Nathanson wrote, for the Albuquerque Journal, a particularly funny essay on Thanksgiving titled "Noise to This Father's Ears." Caught in a maelstrom of chattering, churning children, a clutch of helpless adults ride out a crescendo of unholly holiday racket: "My grandfather looks in and whispers in Yiddish to my grandmother: 'For this we fled Egypt?' My grandmother responds in Russian: 'Cossacks are more civilized.'"

These days, noise has cachet. Musically inclined twentysomethings dig it for its rebellious tone. Bands such as International Noise Conspiracy and Art of Noise wear it proudly in their very names. Noise works even better for its rebellious tone. Bands such as Napalm Death's Noise for Music's Sake, and Joyful Noise by the Derek Trucks Band. There are websites entitled Russian: 'Cossacks are more civilized.'"

I've heard "Geek Noise" and the inevitable "Underground Noise" used as terms for new sub-subgenres of music. For anyone curious as to where some current New York bands, such as the Yeah Yeah Yeahs and The Strokes, mined some of their ideas, New York Noise, a compilation of 1980s NYC punk funk, is worth a listen (check Amazon.com). I've heard "Geek Noise" and the inevitable "Underground Noise" used as terms for new sub-subgenres of music. For anyone curious as to where some current New York bands, such as the Yeah Yeah Yeahs and The Strokes, mined some of their ideas, New York Noise, a compilation of 1980s NYC punk funk, is worth a listen (check Amazon.com).

In one online essay about noise, Petri Kuittinen asserts that "The important characteristic of noise is that it is always unpredictable." If true, that's probably what entices musicians to add clamor to their music. It can be argued that noise in music has been with us since the beginning. Percussion instruments have always had an element of noise about them, particularly in the wrong hands. Anyone who's ever heard a tenor sax begin. Percussion instruments have always had an element of noise about them, particularly in the wrong hands. Anyone who's ever heard a tenor sax begin.

On Real Gone, Waits is as lyrically dense, brilliant, and mad as ever. Uneasy portents hang heavily throughout the record. Images like "An old black tree/Scratching up the Sky/With bony, claw like fingers" or "Shiny tooth talons/Coiled for grabbing a stranger" (both from "Don't Go Into That Barn") are as sharp as ever. Although like most recent Waits albums there is some repetition of sounds and tempos, half the 15 tracks are Waits at his best. "Sins of My Father" has a distinctly topical political bent and a looming sense of something wrong: "Smack dab in the middle of a dirty lie / the star-spangled glitter of his one good eye / Everybody knows that the game was rigged / Justice wears suspenders and a powdered wig." Apocalypse seems to be around the next corner even in "Circus," which is populated by such gritty, playful, on-the-edge Waitsian characters as "One Eyed Myra, Yodeling Elaine, Doctor Bliss," and "Poodle Murphy."

Whenever I review a new Tom Waits album, I get letters saying that Waits is trash; that listening to him is simply too uncomfortable and noisy. Assaultive and difficult listen, terrify the easily buffled.

This is part of Waits' point. He obviously feels that this is the way to explode established artistic conventions. He also uses sound to create atmosphere and add weight: this is not music to be easily ignored. Here when he commands "HOISTTHATRAG!!" ("Hoist That Rag") it's libel to slam you back in your seat.

Real Gone is dark, coarse funk, much of it derived from Waits' vocals, many of which are processed or recorded in "a bathroom." The rhythmic vitality here is extraordinary — this album grooves hard. Some of the inspiration was lifted from the great James Brown, who invented the art of using voice as percussion. Visceral, from the gut, the essence of stripped-down, Real Gone features Waits himself acting as beat box — that is, his voice is the percussion. It's a tough listen, but after several times through, it's clear that no one blurs the boundaries between positive noise and negative music like this raw, fetishy genius. His "naturalistic sound worlds" are now much of his musical identity, the deranged emotionalizing of an eccentric master. They are his way of actively creating new music, something most of his generation stopped attempting decades ago.

The only question now is, how much musical outcry and bedlam can one man make? As long as he continues to write tunes like the spare, slow, Asian-flavored "Sins of My Father" with it's grumble-sing lines like "wicked are the roots grow upward and the branches grow down," I'll both endure and savor the music in his noise.

"skeletons copulating on a tin roof" sounds to me as if he was dissoning noise.

But that assumes that noise can't be music, which is the question posed by one of the most creative forces in popular music today, Tom Waits. If you like oldies, then today's Waits probably isn't for you. Since he began reinventing himself in the early 1980s with the release of Swordfish, (1983), Waits, once a hipster piano-player persona and untouchable, nostalgic songwriter, continues at 55 to delve into noise, attracted to what his new record label, Anti, charitably calls his love of "naturalistic sound worlds." While his last non-soundtrack studio album, the Grammy-winning Mule Variations (1999), was a slight return to more song-based explorations his latest album, Real Gone, is his noisiest yet.

On Real Gone, Waits is as lyrically dense, brilliant, and mad as ever. Uneasy portents hang heavily throughout the record. Images like an old black tree/Scratching up the Sky/With bony, claw like fingers or "Shiny tooth talons/Coiled for grabbing a stranger" (both from "Don't Go Into That Barn") are as sharp as ever. Although like most recent Waits albums there is some repetition of sounds and tempos, half the 15 tracks are Waits at his best. "Sins of My Father" has a distinctly topical political bent and a looming sense of something wrong: "Smack dab in the middle of a dirty lie / the star-spangled glitter of his one good eye / Everybody knows that the game was rigged / Justice wears suspenders and a powdered wig." Apocalypse seems to be around the next corner even in "Circus," which is populated by such gritty, playful, on-the-edge Waitsian characters as "One Eyed Myra, Yodeling Elaine, Doctor Bliss," and "Poodle Murphy."

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