SYSTEM TWEAKS & SONIC TONICS

THE LISTENING ROOM
LEONARD SLATKIN INTERVIEW
MADAMA BUTTERFLY
EQUIPMENT REPORTS:
BASIS, MERIDIAN
CONRAD-JOHNSON
THRESHOLD, VTL
ESOTERIC, ICON
Discover the music you've been missing in your audio system with the new SLA-70 vacuum tube 70 watt (35 watt per channel) Class A stereo amplifier from Cary.

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To find out more about the full Cary line of exciting audio products, visit your nearest "High End" audio dealer or call 1-800-421-5456 or FAX 919-460-3828 for additional information.
"Perfect Sound Forever?" Robert Harley examines the implications of a recent paper on digital audio by one of the world's leading authorities on the subject, Sony's Roger Lagadec.

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THE FINAL WORD

Larry Archibald rounds off the last issue of 1990.

DECEMBER 1990 VOL. 13 NO. 12
Next month, we will be publishing Stereophile's first "Recommended Recordings." Music Editor Richard Lehnhert asked every Stereophile writer to list the five records without which life would not be worth living; the result will be what we hope will be the definitive list of "must-have" records regarding performance and sound quality. In addition, equipment reviews in January will include: amplifiers from Krell, Threshold, and Goldmund; loudspeakers from Avalon, Snell, and Phase Tech; and CD players from CAL, Sony, Philips, and The Mod Squad. And Martin Colloms offers an essay examining the state of subjective reviewing.

Although we always do our best to put out the best magazine we know how, it is gratifying to have others endorse our efforts. We were proud, therefore, when the jury selecting finalists for MagazineWeek's 1990 Publishing Excellence Awards chose Stereophile to be one of the three finalists in the Engineering/Technology category. (The other two were Popular Mechanics and Technical Review.) We didn't win the award—that honor went to Popular Mechanics—but maybe next year...
Everybody, including myself, was astonished to find that it was impossible to distinguish between my own voice, and Mr. Edison's re-creation of it.

—Anna Case, Metropolitan Opera Soprano, 1915

In the July "As We See It" (Vol. 13 No. 7, p. 5), I examined the conflict between those who believe existing measurements can reveal and quantify every audible aspect of a component's behavior, and those who consider the listening experience a far better indicator of a component's performance than the numbers generated by "objective" measurements. Implicit in the objectivist position is the assumption that phenomena affecting a device's audible characteristics are well understood: any mysteries have long since been crushed by the juggernaut of scientific method. If people then hear differences that "science" cannot measure or quantify, those differences exist only in people's minds and have no basis in reality. Consequently, observers' listening impressions are virtually excluded from consideration as merely "subjective," unworthy of acceptance by audio science. This belief structure is at the very core of the audio engineering establishment, and is the guiding force behind their research efforts.

The subjectivists believe that the ear is far superior to test instruments in resolving differences. It is also axiomatic that vast areas of audio reproduction, far from being fully researched and understood, are instead considerably more complex than the simple scientific models used to describe them.

A good example of this is the well-publicized subject of CD treatments. In the October issue (Vol. 13 No. 10, p. 5) I described my experiences with cryogenically frozen CDs, as well as CDs pressed from the same stamper but made from different molding materials. I am particularly fascinated by CD treatments not for what they do, but for what they represent. The fact that cryogenically freezing a CD results in an easily audible change in sound points to the uncomfortable (for the engineering establishment) conclusion that everything is not as simple and well-understood as is thought.

A result of this dichotomy is that academic researchers—the very people in whose hands

1 "To doubt everything or to believe everything are two equally convenient solutions; both dispense with the necessity of reflection." Jules Henri Poincaré, as quoted by Bertrand Russell in the preface to Science and Method.
There are those people who say that to choose a hi-fi you have to understand the jargon, and know all about power ratings and performance figures. In our opinion, these people are talking nonsense. Because specifications don’t tell you what a hi-fi actually sounds like. The only way to find out is to listen. Go to your Linn dealer, and you can compare our hi-fi with a selection of other good equipment. You don’t have to be an expert. You’ll find it very easy to hear the difference. To be honest, the best system will stick out like a banana in a hi-fi ad.

**It’s as relevant to hi-fi as technical specifications.**
lie the tools and knowledge to discover the physical causes of these phenomena—are the least likely to listen critically and the most likely to dismiss the audiophile's claims as nothing more than voodoo. Consequently, their research direction is dictated by improving measured performance rather than increasing subjective performance; the latter is far more meaningful when the goal of research is to better communicate the musical experience.

Those who make their livings from digital audio (like mastering engineers) have long complained about sonic anomalies and perceptual differences where no differences should theoretically exist. The academic audio community, as well as manufacturers of professional digital audio equipment, maintain that those differences—unsupported by theory and unmeasurable—are products of the listeners' imaginations.

This thinking was exemplified by events during a two-day Sony seminar on digital mastering technology I attended a few years ago. The designers of the Sony PCM-1630, DAE-1100 digital editor, and other digital mastering equipment were present. The seminar was attended by mastering engineers who work with, and listen to, this equipment daily.

One of the mastering engineers expressed his concern over the audible degradation that occurs when making digital-to-digital tape copies, and the sonic differences introduced by the digital editor, especially when using the editor's level adjustment. These comments set off an outspoken flurry of concurrence among the assembled mastering engineers. The Sony designers argued vehemently that no differences were possible, and regarded the collective perception with some amusement. This exchange is a microcosm of the conflict between those who listen and those who measure.

Such is the background of this essay's subject, a paper by Dr. Roger Lagadec entitled "New Frontiers in Digital Audio" presented at the most recent Audio Engineering Society Convention in Los Angeles. I believe this paper will one day be considered a turning point in digital audio's evolution. Copernican in scope, it is likely to radically change the direction of and thinking in audio engineering. Lagadec's thesis is of utmost importance to the audiophile, both because of its promise of greatly improved digital audio, and for its validation of a fundamental audiophile philosophy: the importance of critical listening in evaluating audio technology over the belief that existing measurements can reveal all differences. Furthermore, and perhaps most significant, the paper was written by a man considered by many to be the world's foremost thinker in digital audio, whose ideas carry enormous influence in the audio engineering community.

As a pioneer in digital audio since 1973, Dr. Lagadec has conducted fundamental research into digital signal processing, was one of the developers of the Digital Audio Stationary Head (DASH) format while at Studer, and has offered broad, conceptual insights into the nature of digital audio. He holds a Ph.D. in Technical Sciences in the field of Digital Signal Processing, and has been actively involved in setting digital audio standards within the AES, of which he was named a Fellow in 1983. He is now responsible for all professional digital products at Sony. It is difficult to overstate Dr. Lagadec's credentials or his ability to influence digital audio thinking.

"New Frontiers in Digital Audio" is bold in concept, brilliant in its simplicity, and technically incontrovertible. The paper identifies two areas of digital audio considered fully understood—digital-domain gain adjustment and dither—and reveals fundamental concepts about these areas that had not previously been considered. Moreover, the paper correlates these new discoveries with the perceptions of

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2 It is common practice among many record companies, when transferring the analog master tape to digital, to "clean up" the tape by following the fades on the analog master with the digital fader. This reduces the analog tape hiss during the fade and inserts "digital silence" (all encoded data words are zero) between tracks. However, this standard practice causes low-level signals—already a challenge to digital—to be requantized in an extremely crude way. The end of a fade often includes reverberation decay that contains spatial information—the worst place for loss of low-level resolution. And now since the analog master has been converted in digital and is "perfect," "permanent," and "impervious to tape degradation," the analog master is sometimes destroyed to clear vault space. Recently, however, there has been a trend away from subjecting the program to such "improvement."

3 When a signal is attenuated in the digital domain, each sample is multiplied by a number less than 1 (the coefficient), with the coefficient determined by the amount of attenuation. Requantization noise is added to the signal since the new number generated (the product of the sample and the coefficient) must be rounded off to the nearest quantization step, creating an amplitude error that is manifested as quantization noise. Dither is typically an analog white noise added to the signal before it is digitized. The addition of dither allows resolution below the least significant bit (LSB), and renders quantization noise less audible by making it more random and less correlated.

Krell Industries has long been recognized in international audiophile groups as a leader in amplifier and preamplifier design. This enviable reputation has been earned through a combination of superb sonic quality, innovative features, reliability and impeccable service. Due to steady growth Krell products are now available in fine audio retail stores across the country.
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trained listeners whose comments were once considered heresy. Significantly, Dr. Lagadec's thesis extends beyond digital gain adjustment and dither: these two relatively simple issues are paradigms for the broader and more complex conflict between measurement and human musical perception. In this analysis, I will avoid most of the paper's technical details and focus instead on the broader issues raised.4

Dr. Lagadec challenges the conventional wisdom that requantizing a digital audio signal with a digital fader produces only a change in level accompanied by a slight noise increase. “The imprecise, but by no means uncertain, answer of experienced users has sometimes been that—with critical signals—the texture of the new signal, its fine structure, possibly its precise spatial definition, will be affected: the signal will (sometimes) have changed in a way uncorrelated to level change and noise level, in spite of the extreme simplicity of the digital signal processing it underwent. . . . The rest of this chapter cannot have the ambition of proving that such vague (but genuine) comments are true in an absolute sense. Rather, it will try to make the point that, based on a straightforward analysis, it is implausible that well-trained personnel would not detect differences beyond noise and signal level.” (emphasis in original)

This, in itself, is a remarkably bold position for Dr. Lagadec to adopt. To acknowledge that previously unidentified phenomena affect the subjective perception of digitally processed music is indeed a milestone on the road to improving digital audio. Furthermore, the thesis doesn't summarily reject the listening experience as an important contributor to understanding these phenomena. The audio engineering establishment typically rejects listening because one's perceptions cannot be proven in a scientifically acceptable method and are therefore meaningless. It is also unusual for a man of science to use a lexicon associated more with audiophiles than scientists (“the texture of the new signal, its fine structure, possibly its precise spatial definition”). The audiophile, however, would have described these perceptions in more blunt terms; textures hard rather than liquid, loss of inner instrumental detail, and a collapsed soundstage.

Dr. Lagadec supports his thesis with a very simple analysis of what happens when changing level in the digital domain and the nature of the attendant requantization error. This function is considered perhaps the simplest and best-understood type of digital signal processing. However, he has discovered a previously unknown form of error created by this simple processing: the digital gain control's transfer function (difference between input and output signals) varies according to the amount of gain or attenuation. The nature of the transfer function's non-linearity (imprecision), introduced by changing gain in the digital domain, is determined by the gain pair ratios; ie, the relative beginning signal level and the signal level after gain reduction. I won't go into the details here: the phenomenon is explained and documented fully in the paper.

This discovery is extraordinary for two reasons. First, it vindicates those who have long maintained, after critical listening, that digital faders affect sound quality.5 Second and more important, it reveals that even the simplest aspects of digital audio that are thought to be well understood are, in fact, not well understood. Dr. Lagadec has worked for the past 7 of his 17 years in digital audio in the area of digital level control, yet recognized and began researching this phenomenon during only the past year. Again, I quote Dr. Lagadec's paper: “It is remarkable that such a simple system, eminently amenable to the methods used in non-linear dynamics, has not—to the author's limited knowledge—been widely publicized yet. If an element of surprise can come from analyzing such simple systems, more instructive surprises may be in store when more complex ones are scrutinized.”

With this last sentence, Dr. Lagadec implies that a digital Pandora's Box may be opened by closer analysis of other aspects of digital audio. Like the Pandora's Box of Greek mythology

4 A Preprint of “New Frontiers in Digital Audio” (preprint #5002, Session Paper 4K-2) is available from the Audio Engineering Society, 60 E. 42nd Street, New York, NY 10165. I must stress that this essay is merely my interpretation of Dr. Lagadec's ideas, which I offer with great trepidation. Readers are encouraged to order the preprint and form their own conclusions. In addition, I should distance my opinions and speculations from those put forth in the paper. I have taken a very broad interpretation and am, admittedly, far from unbiased and dispassionate about the subject.

5 As did Doug Sax, the co-founder of Sheffield Lab who runs The Mastering Lab, a disc-cutting and CD master-tape preparation facility in Hollywood, CA. In an interview with JA, published in the October 1984 issue of HPN/R&R and later in the mastering industry magazine One-on-One, Doug maintained that “When you go through a digital editor... the loss is traumatic. You go in apples, you come out oranges.” See also my interview with him in Vol. 12 No.10.
that contained the world's troubles, this digital Pandora's Box may reveal other problems in digital audio that no one knew existed. An understanding of these cracks in conventional digital audio theory will go a long way toward correlating listeners' subjective impressions with objective fact.

The paper then examines dither, another area which, like digital gain adjustment, is considered a closed subject because it is well understood. Dr. Lagadec presents a hypothesis which states that dither should be optimized based on the ear's short-term perception of quantization noise, rather than the current mathematically based long-term analysis: "Needless to say, the 'optimal' dither types in the long-term statistical sense which have been proposed by Vanderkooy [sic] and Lipshitz* are a very valid first approach. As they are, however, independent of any practical detector model, it is not unfair to expect further improvements in perceived performance from dither models optimized in a different, less mathematically rigorous, and more perceptually oriented way."

With that analysis, Dr. Lagadec again proposes that an existing precept, thought to be immutable, is in fact far from a settled question. Moreover, one can infer that future research should be based on improving perceptual qualities rather than conforming to mathematical theories. This is reflected in the phrases "independent of any practical detector model" (my interpretation: "without regard for human hearing"), and "dither models optimized in a different, less mathematically rigorous, and more perceptually oriented way." (emphasis added)

Significantly, this suggests that the criterion for what is considered optimum dither should be based on human hearing rather than on purely mathematical ideas or measurements that have little relation to auditory perception.7

This represents a remarkable shift in thinking away from the scientific dictum that measurements and theory are more reliable and important than human perception in determining "what is good" in music reproduction. The human perceptual element in audio engineering has long been disregarded because it cannot be quantified. The ability to measure and quantify an entity are the criteria by which science judges that entity's reality. The scientific mind tends to mistrust anything than cannot be represented or communicated by linear symbols. These symbols that describe reality, obtained by measurement and calculation, assume a greater importance than, or are even mistaken for, the actual reality they try to represent. It is thus momentous that one of the world's foremost audio scientists has called for accepting musical perception directly rather than in the abstract, linear terms of representational thinking.

Dr. Lagadec points to some future directions in digital audio, including "a much greater word length" than the current 16-bit system, and bandwidth much wider than 20kHz. This additional bandwidth would be "kept open for, say, low-level harmonics, harmonics due to nonlinear processing, and out-of-band noise shaping." An advantage he notes of having bandwidth beyond 20kHz "would be the freedom to disregard the arguments as to whether there is perceptible sound beyond 20kHz." However, he notes that "For economic reasons, it is evident that hardware capable of such parameters at an acceptable cost is not for this decade."

This concept of today's digital audio being in its infancy and subject to radical changes in fundamental precepts is in sharp contrast to the prevailing view among most academics that the 20kHz bandwidth is adequate, and that properly dithered 16-bit representation provides sufficient resolution and dynamic range. Indeed, the idea that today's digital audio parameters are perfectly satisfactory for music were expressed by Dr. Stanley Lipshitz parenthetically in his "Tutorial on Phase," given at the convention. He somewhat derisively scolded critics of digital audio for speciously (in his view) blaming today's digital audio's fundamental parameters (he specifically mentioned sampling rate and word length) as the cause of its inferiority (in the critics' view) to analog.

Dr. Lagadec then says that since the previously unknown aspects of digital audio he has
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discovered correlate to what critical listeners have been saying for years, perhaps other claims of audible differences should not be dismissed so cavalierly by the audio engineering establishment, despite the lack of scientific proof of such differences. I was astonished by the paper's last paragraphs (quoted below), in which Dr. Lagadec expands his thesis by bringing up the subject of audible differences between cables. Claims of differences between cables have long been a bugaboo of audio engineers. Further, he contends that if no measurable differences exist between cables, yet critical listeners report such differences, perhaps our understanding of human hearing acuity is suspect, rather than the rationality of those who hear differences.

The paper concludes by calling for the world's audio scientists and researchers to vigorously pursue these new challenges and to make room for, rather than exclude, the role of listening in advancing audio science. Dr. Lagadec writes: "The industry is full of lore as to the superior sound quality of some cables, connectors, electronic devices, and the like. Assuming, as scientists presumably should, that things can only sound different if they cause signals to become different, and using the technology available today to ascertain whether differences do exist, and if so what they consist of, we may hope to achieve reproducible improvements; to deepen our understanding of sound quality; and to separate unfounded legends from justifiable improvements.

"Conversely, if we were to discover that, when, say, different cables are used, the signals look the same beyond the resolution of today's best converters, but still sound reproducibly different, then we would indeed still have much to learn about human audibility.

"The advanced tools available today—the recorders, computer software, workstations, DSP chips and boards, monitor systems, A/D and D/A conversion systems, instrumentation—and which are within reach of any university might be put to use, scientifically, aggressively, to find out how we hear, and how we might improve what we hear. Every generation since Edison's days has said that its sound recordings were almost better than the original, and at the very least indistinguishable from reality. Ours will hardly be an exception, neither in hubris and hype, nor in the disappointment. Yet we have tools for generating and manipulating signals, moving them in space and time, which few of our predecessors dreamed of. The tools deserve to be used, and our engineers deserve to be guided, by scientists who will advance the state of the art ahead of the state of the industry."

Although the tenets put forth in "New Frontiers in Digital Audio" are hardly new to audiophiles, the paper is revolutionary to the mindset of the audio engineering community. What makes this paper such a significant and extraordinary event is the credibility and influence of its author. You may be certain that Dr. Lagadec does not speak lightly or from a shaky platform. Consequently, the ideas expressed in the paper will be given serious consideration by those accustomed to attacking the very same ideas when espoused by those of us without Ph.Ds.

As I considered the paper's ramifications, I couldn't help thinking about the people who for years have reported sonic anomalies in digital audio, only to be met with skepticism and ridicule. This is especially true of Doug Sax, who was one of the first and most outspoken critics of digital. During the past eight years, he has reported his listening experiences to an indifferent world. Despite his pre-eminence in the field of record mastering, he is regarded as a pariah by the audio engineering community for his views, views which I believe have been taken a step toward scientific fact by "New Frontiers in Digital Audio." If "genius" is defined as the arriving at conclusions ten years before the rest of the world reaches those same conclusions, then both Roger Lagadec and Doug Sax, disparate as their approaches are, certainly qualify. The fact that Dr. Lagadec's paper may cause the audio engineering establishment to take seriously the listening impressions of people like Doug Sax is small consolation to music lovers who must listen to inferior CDs made during the period between when the problems were first reported (1982) and when the problems' existence were proved in a scientifically acceptable method (1990).

"New Frontiers in Digital Audio" holds out the hope that one day digital audio may exceed analog's performance in all respects. It is my sincerest hope that our successors regard today's pronouncements of digital audio's quality with the same combination of humor and incredulity with which we view Anna Case's assessment of Mr. Edison's machine.

Stereophile, December 1990 13
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Threshold founders Nelson Pass (right) and René Bezné with the first Threshold preamplifier, the Model NS 10. The NS 10 contained advanced single-ended ultra class A and non-feedback technology which predated the present popularity of these techniques. Typically for Threshold, the 1977 introduction of this preamplifier set state-of-the-art standards that are still valid today.

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Your Authorized Threshold Dealer will be pleased to audition these exciting new Threshold components. For the location of your nearest Threshold dealer you may call 1(800) 888 8055, or write InConcert, 12919 Earhart Avenue, Auburn, California 95603.
We regret that resources do not permit us to reply individually to letters, particularly those requesting advice about particular equipment purchases. Were we to do this, a significant service charge would have to be assessed—and we don’t have time to do it anyway! Although all are read and noted, only those of general interest are selected for publication. Please note, however, that published letters are subject to editing, particularly if they address more than one topic.

Congress vs AAHEA

Editor:

As I write this, the battle is not yet decided. Congress may yet impose a 10% tax on all consumer electronics products over $1000. This ill-advised proposal would dramatically change the face of high end as we know it. One of the last bastions of American technical prowess could be eliminated, not by competition, but by Federal law.

Kathy Gornick and I met with Gary Shapiro, VP of the EIA/CEG, in mid-September to establish dialog between the Academy for the Advancement of High End Audio (AAHEA) and the group that runs the CE Shows. We were not prepared for the bad news Gary was about to deliver. The “Budget Summit” occurring to hammer out a compromise on the next federal budget would include some sort of “luxury” tax on Consumer Electronics. Though the exact numbers hadn’t been agreed upon, it was said that the deal was all but done. Gary sent a fax to all the specialty manufacturers who display at CE Shows urging them to contact their congressmen and senators.

What else could we do? The Academy, just barely launched, hadn’t even gotten out formal membership invitations. Yet this was the kind of problem that the Academy hoped to be able to address once established. This was why the steering committee and the Board spent so much time fine-tuning what the organization should be. Nobody expected their vision to be tested so quickly and so critically. High end had to be mobilized, and who but the Academy, with its extensive membership list, was in a position to act quickly enough? There were only two weeks until the budget deadline.

By the next day, the plan was formed. Success depended on contacting anyone who had an interest in the continuing success of the high-end industry, more specifically the American high-end industry. The attack was aimed at local congressmen as well as the “Budget Summit” group. Given the protectionist sentiment in Washington, our only hope was to make legislators aware of the uniquely American makeup of the market above $1000 and what their proposed tax would do to a high-technology industry consisting primarily of small, privately held companies.

The response to the Academy’s pleas was overwhelming. Within three days, virtually every manufacturer, distributor, and dealer of high-end audio in the US was made aware of the urgency of the situation. All were asked to have everyone in their organization phone, fax, and write. The Academy provided phone numbers, sample letters, and statistics. PARA [the Professional Audio/Video Retailers Association], IPRO [the Independent Representatives Association], and NFIB [the National Federation of Independent Businesses] were contacted. Major newspapers were informed. Some manufacturers shut down production to have their employees make phone calls. Others refused orders if dealers had not called or written their congressmen. One even enlisted the talk radio network in his city. Dealers brought their customers into the battle. The Academy contacted every member of Congress at least once. High end came together as never before.

So after the thousands of man- and woman-hours expended by virtually everyone in the high end, we wait. Ours was but a small part of a large effort to stop taxes on consumer electronics. But whether we succeeded or not, Larry Archibald [Stereophile], Wendell Diller [Magnepan], Joyce Fleming [The Mod Squad], Mark Glazier [Madrigal], Kathy Gornick [Thiel], Sallie Reynolds [The Absolute Sound], John Russell [Bryston Vermont], Gayle Sanders [Martin-Logan], Karen Sumner [Transparent Audio Marketing], and Kevin Voecks [Snell] led the charge and were instrumental in organizing the kind of unified fight skeptics said could never happen in our industry.

It is an auspicious beginning for the Academy. I have never been more proud to be a part of the high end than I am today. Let’s hope
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Congress doesn't vote to darken the bright future high end has before it.

**William Peugh II**

(International Audio Technologies)

Executive Director, The Academy for Advancement of High End Audio

Bill's letter was written before President Bush announced the proposed deficit-control budget package on Sunday, September 30, which was then rejected by the House on October 5. Although proposed "luxury" taxes remained in force for expensive furs, jewelry, and cars, the 10% extra tax on electronic components costing more than $1,000 had been deleted from the defeated package, presumably because of the efforts of the Academy and the high-end industry. I sit befuddled, however, at the closeness of this shave. Given that more than 60% of components priced over $1,000—approximately $300m annual market—are made in the US, how could a tax that would undermine the marketability of domestic bi-fi equipment vis-à-vis the Japanese competition, a tax that would raise a mere $30m or so annually, be seriously proposed by politicians apparently concerned with the reduction of imports! and the preservation of American jobs? Unless, of course, they believe that all bi-fi equipment is imported and that there are not therefore any domestic manufacturers to be offended by such a tax. Making the American public and their elected officials aware that the US does have a healthy domestic bi-fi industry would therefore seem to be the Academy's next priority.

Some progress has been made in Congress. In the industry newsletter Inside Track, it was reported that Speaker of the House Tom Foley and Representative Dan Rostenkowski were aware of the uniquely American nature of the high end, as is Senator Pete Domenici, as you can see from his letter to Larry Archibald that follows. But I worry that, too often, politicians will echo New York Senator Daniel Patrick Moynihan, a member of whose staff, upon being informed of the fact that the proposed luxury tax would hurt American companies, responded to Stereophile's Ken Nelson by saying, "So what? We have to raise revenue from somewhere."

—JA

Larry Archibald, Publisher

*Stereophile*

P.O. Box 5529, Santa Fe, NM 87502

Dear Larry:

Thank you for your recent correspondence regarding the possibility of increased taxes on consumer electronic products. I am glad to have your views on this important matter.

I appreciate your input on the structure of the industry and the impact a $1000 threshold would have on electronic equipment manufacturers in the United States.

Congress is currently faced with the goal of raising $20 to $25 billion to meet our budget targets. Many proposals have been voiced as a means of fulfilling these numbers.

I still insist that reductions in government spending should be addressed before we increase taxes. It is evident, however, that some revenue-raising proposals are necessary to ensure the fiscal soundness of our Country. Given this, any taxes that are considered must be efficient and equitable.

I am very sensitive to the tax burden that the audio manufacturing industry must endure. And I'll do my best not to make your job any harder.

Again, thanks for contacting me. I am keeping your views in mind.

My warmest personal regards.

**Senator Pete V. Domenici**

R-NM

**The ACLU Monthly?**

Editor:

As a recent subscriber, I have been quite pleased with your publication. I find the music reviews of special interest, and the equipment reviews are well done and very informative. . . Congratulations on a well-balanced, interesting publication.

Oh, by the way, I just thought I would call to your attention the fact that the name on the cover of the issues that I have received is *Stereophile*. I mention this because in the last few issues, some letters that apparently were intended for *The ACLU Monthly* were mixed in. In fact, in the September issue, a letter from a Mr. Kohn was published that, among other things, urged more editorial viewpoints on what he has mistaken as an important issue disguised as trash. As I am sure you realize, subjects such as this (as well as which deceased conductors supported which political party)
Making music is an art; making loudspeakers is a science. Nowhere will you find leading-edge technology put to finer effect than with Monitor Audio.

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(Studio 10) ... "I found listening to this design to be an exhilarating experience bordering on intoxicating at times, and one that didn’t pall."

Hi-Fi Review (Feb. 90)
reduce the amount of space available for the subject at hand. I used to subscribe to a computer magazine until they were afflicted with the same symptoms I now see in the pages of Stereophile. I hope that you won't let the same thing happen to your magazine.

Dexter W. Jones
Deerfield, IL

I'm sorry you feel that way, Mr. Jones. Neither hi-fi nor music nor computers can exist in isolation from the real world, and the issues you mention, though peripheral, do seem to me to be worthy of debate within Stereophile's pages. In particular, Mr. Kohn's raising of the issue of freedom of speech with respect to 2 Live Crew's lyrics is germane to any publication that puts the need for its readers to be truthfully informed above any obligation to be responsive to the needs of its advertisers. William Ziff Jr., one of the more commercially successful publishers, recently said² that "We expect the editor's quest for journalism to offend a significant number of people every year..." I also believe that responsible editing will inevitably result in some magazine readers being offended, but that's the price to pay for freedom of speech and expression and the dissemination of the truth. (Incidentally, I do find 2 Live Crew's lyrics extremely offensive, agreeing with George Will in Newsweek that they promote the idea that it's okay to use unwilling women for violent sexual gratification, and yes, I am a card-carrying member of the ACLU.)

So am I.

—JA

—RL

Paper or plastic?
Editor:
You might be interested in something I read the other day on the subject of landfills. It is a common but erroneous belief that plastic is evil and paper is good. The facts are we are burying far more paper than plastic and the paper does not disappear through decomposition. The landfills are so well sealed that the garbage is preserved for decades. Possibly many decades. So, those plastic wrapping shoppers aren't so bad after all.

Vincent M. Knoll
Seattle, WA

A is bad, but B is as bad as A; ergo, A is good?
—Andrew Main
Stereophile production staff

²In an interview in Magazine Week, August 27, 1990.

Mitchell & SCMS
Editor:
Peter Mitchell's "Industry Update" column in your September 1990 issue inaccurately described the Senate hearing on SCMS. First, he stated that Jay Berman, president of the RIAA, wanted the bill amended to cover Digital Compact Cassette (DCC). The bill as currently written would cover DCC, and Mr. Berman in fact wanted DCC excluded and the bill narrowed to cover only R-DAT so that more restrictive legislation could be written specifically for DCC. The wisdom in the record industry is that R-DAT will fail in this marketplace and DCC succeed. Berman thinks the feeble SCMS system is better than nothing, but certainly adequate to deal with the threat he sees posed by DCC.

Second, Mr. Mitchell implied that I was "brought forth" by the Copyright Coalition to pour cold water on SCMS. In fact, I showed up to speak for myself and Isophonics. My argument was the SCMS didn't protect copyright holders, but did allow the Japanese to soak consumers by charging high prices for "professional DAT recorders" without SCMS. I got into a big argument in front of the Senators with Len Feldman, who testified that SCMS was difficult to bypass. I said that I spoke from experience since our PCM 4.1 inadvertently defeats SCMS when placed between two R-DAT machines and that the signal only travels through $10 worth of chips from digital input to digital output (ie, if you aren't using the portions of the unit that store and retrieve digital audio from video tape). Although Len never claimed to have any expertise in designing digital circuits, the Senators didn't know whom to believe. The argument was nicely settled by George Wilson, the only electrical engineer there aside from me, who brought his $44 purpose-built bypass box along.

Finally, Mr. Mitchell notes that copy protection is asserted when the C bit is 0 rather than 1, and seems to think that this matters ("someone has to take the trouble..."). Electrical engineers find it just as easy to assert "positively asserted" digital signals and "negatively asserted" ones such as the C bit. Wiring a pin to ground is no harder or easier than wiring it to +5V. Permanently setting a bit to 0 or 1 is not likely to be regarded as trouble by any competent engineer, and given the way digital audio is transmitted, the C bit must be definitely set.
“Get out your checkbook, Michael.”

Robert Harley on his friend Michael:
"... willing to fork over a couple of kilobucks, provided the processor provides truly musical performance and isn't likely to be significantly surpassed at the price anytime soon."

Robert Harley on Theta DS Pro Basic:
"To say I liked the Theta DS Pro Basic is an understatement. It provided a level of musicality I would never have expected at this price."

"It had all the attributes of the best digital playback: a deep and transparent soundstage, smooth tonal balance, spatial detail galore, and textural liquidity."

"The DS Pro Basic clearly breaks new ground in affordable digital playback. It represents a quantum leap in what we can expect from a $2000 processor. All contenders for the title of best reasonably-priced converter must regard the Theta DS Pro Basic as the benchmark against which all others are judged."

"Get out your checkbook, Michael. The Theta DS Pro Basic is exactly what you've been waiting for."

Robert Harley
Stereophile, Vol. 13, No. 8
Aug., 1990

Michael, with his brand new Theta DS Pro Basic

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A question of scale
Editor:
Congratulations are due Peter Mitchell and Stereophile for his essay in the September issue (p.5), "A Question of Scale." He drives an opening wedge of sanity into Stereophile's portal. He lets in a huge breath of fresh air, a broad ray of light, a hope for increased reliance on the scientific method in making judgments. He presents a refreshing perspective on basics and tweaks, and on high-end units and those lower down. The item is required reading and re-reading.

Speaking of the scientific method, I am not altogether convinced by Ken Kessler's enthusiasm about Kontak, a contact cleaner, in the August issue (p.57). His endorsement would be more credible had he done something more scientific, about as follows: Apply Kontak only to the interconnects for one channel, say the left. For the right channel, go through the same procedure of disconnecting and reconnecting the cables, but without applying contact cleaner. Using a mono source, one speaker, and a switch to feed either channel to the speaker, compare the two channels. It is possible that the wiping effect of disconnecting and reconnecting cables, particularly if done with a twisting motion, could account for reduction in resistance and improvement in sound. Herman Burstein
Wantagh, NY

A question of acoustics
Editor:
Referring to some issues discussed in Peter W. Mitchell's "A Question of Scale" editorial ["As We See It," Vol.13 No.9], I am quite impressed at the minute differences picked up by expert listeners, specially if this is possible in a range of 7.7 to 8.5 on a scale of 1 to 10. Some explanation would, however, be useful on how the value 10 for live music is measured.

I believe that high fidelity has reached such an advanced point that acoustics must be considered in any evaluation. Being an orchestral music listener, let's suppose I wish to listen to the Berlin Philharmonic Orchestra. Should it be in the Musikvereinsaal, Vienna, Lincoln Center, or Constitution Hall in Washington, DC? The sound in the many halls available can be rated from 1 to 10. Next, how will the orchestra be seated? All violins to the left? Cellos center or right? Then comes the location of my seat. In a 2000-seat concert hall the golden-ear listener must hear 2000 different combinations. But surely there will be a huge difference between a front-row seat at the right edge, a center seat in row 10, and the last balcony seat to the left. All the above influence treble, bass, detail, sweetness of sound, and dynamic range. Strangely, those are the factors we judge speakers by. In my view, speakers should be judged between each other, live sound must be left alone. Maybe the whole hi-fi business is so booming because, for half the price of a ticket, you get the best seat in the house. Ernest Winter
Bethesda, MD

Bravo, Peter!
Editor:
Bravo, Peter! ("As We See It," August 1990) This thoughtful article wonderfully expressed my own reasons for preferring CD replay to LP. I'm fed up with being treated by the audio press as a cloth-eared philistine who has swallowed, hook, line, and sinker, the record companies' "perfect sound forever" hype. I simply can't deny that surface noise, clicks and pops, inner-groove congestion, and vinyl's myriad other failings bother me much more than do CD's particular inadequacies.

The only point with which I must take minor issue is Peter's categorization of audiophiles into two camps: the pro-CD and the LP faithful. I, along with, I'm sure, many of Stereophile's readers, fit into neither category comfortably. Our music collections roughly fit the following criteria:

1) virtually all newly purchased music is on CD;
2) LPs are replaced by their CD equivalents whenever possible and at whatever rate the software budget will allow;
3) a significant number of the records we own will never be available on CD, meaning that vinyl replay will forever remain an important, though not permanent, part of the audio system.

This relatively small amount of vinyl does not justify the purchase of a turntable in the Sondek/Xerxes/HW-19 price bracket (though surely some would disagree), but neither does it warrant simply "scraping by" with a Dual or Thorens. It is thus in the middle ground that I would like to see the bulk of Stereophile's
Your ears are acute enough to hear the ultimate reproduction that your system is capable of delivering. But does your system deliver? It won’t if you overlook one of its most important components, the interconnects.

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A fundamentally flawed Mitchell?

Editor:
I suspect that you will have received several letters concerning Peter Mitchell's diatribe in the August 1990 Stereophile ("As We See It," p.5), but in case others are not doing their job, I shall throw mine upon the stack. I suspect there are many like myself who will not agree to disagree concerning PM's views. I feel PM's thesis is fundamentally flawed. Grab your August issue and read along.

1) LP "lovers" are not necessarily highly trained to "tune out" ticks and pops. Anyone who has spent any time at live concerts knows that if you concern yourself with every last cough and shuffle created by the audience you will drive yourself mad. Ticks and pops are no different. A properly set-up stereo will not overemphasize ticks and pops, and when they appear they are more often in the speaker than in the soundfield. You may use that as one very accurate measure of the quality of a system or its setup. (Not to mention the care that a given recording has received. Take care of your software! Record companies are not music libraries, they are companies in the business of making a profit with music. Recordings therefore are not disposable items. They will go out of print as profitability goes down.) If the ticks and pops get louder, something has gone wrong. Negative feedback in the playback chain will enhance ticks and pops due to time-domain distortions and enhanced odd-ordered harmonic content in the signal. I do see PM's point about wow being a very real problem, but one that is solvable (however unlikely due to the current market disposition).

On the other hand, it is not possible to separate the distortions caused by digital playback systems, as they are inherent in the soundfield. If you think digital systems do not generate distortions, think again. While a digital system will not generate harmonic distortion, it will generate distortion that is non-harmonically related to the music and is instead related to the sampling frequency. Each time the signal is sampled and quantized, the distortion is generated. Because classic distortion equipment is designed to read distortions that are harmonically related, such equipment will not read the types of distortion actually generated. The distortion spec is called nonharmonic distortion, and a good CD player will generate levels of it about 40dB down. This type of distortion is very evident to the ear. Audiophiles do hear it (bright, brittle, etc.). Nonharmonic distortion is more evident as frequency increases. This problem would be dramatically reduced by increasing the sample frequency, both in record and playback, but the political battle that is Philips and Sony will not allow it for many years due to the incredible consumer backlash that would occur. Thus Digital Winter.

2) LP "lovers" do listen to very complex material; the idea that such is not so is simply ludicrous! I found it telling that the only record labels PM cared to mention were two known for their poor sonic character among record collectors, and are known that way on CD as well! Columbia and DG are particularly known for the lack of dynamic range on all their recordings. Try a quality record sometime. A good record does give you a sense of the orchestra going full tilt.

3) I know a few audiophiles desperately seeking four-channel LP recordings, and I agree with PM that the addition of surround-sound effects can greatly enhance the sense of reality a recording can impart. If you don't believe me, set up a two-channel stereo in a good auditorium and play back a proper two-mike recording. Please keep in mind that most producers aim for front-row center. PM's comments concerning Row J, "subtle" differences in imaging, and such do make one wonder. Stereo and high-end audio in general are all about making the playback sound real. Arbitrary decisions about what one prefers are not in the scope of such an endeavor. Deciding what one prefers is fine, but the result may not be true to the music. This is a lesson for the record labels as well.

It sounds to me as if PM has spent many years listening to mediocre recordings, and if he is sick of that, I can hardly blame him. The LP, like
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the CD or any other source we currently have at our disposal, is flawed in many ways. So is the equipment that reproduces these recordings. It is usually more effective to deal with problems by finding solutions to them, rather than running away. You would do that if it was an amplifier or speaker that had a problem: why are the recordings any different? Ultimately, all problems are solvable (even digital systems can someday be fixed). For now, digital systems are definitely a flight rather than fight behavior.

Please do not get me wrong. PM is entitled to his interests as guaranteed by the US Constitution, but please do not mistake his voice as that of authority.  

Ralph Karsten  
St. Paul, MN

A fundamentally correct  
Mitchell?  
Editor:  
Bravo to Peter W. Mitchell on his article “Can We Agree to Disagree” in the August 1990 issue (Vol.13 No.8). He hit every topic that I usually end up discussing with other “analog LP-loving” audiophiles. When the CD was released, all I could say was “awesome.” I no longer listen to proponents of the LP unless they can tell me that they attend at least two indoor Classical performances a month! There are no ticks or pops to be found at Orchestra Hall in Chicago—I can’t recall ever picking up a trace of inner-groove modulation! Try and put the full dynamics of a Lyric Opera soprano on vinyl—not possible! Mr. Mitchell is correct in stating that the surround-sound available in today’s digital components adds the realistic touch—particularly for those of us who sit 7th- to 10th-row center. Try recreating those subtle reflections and grand dynamics with two LP grooves—stylus mechanics aren’t very forgiving! Finally, Mr. Mitchell reaffirms my belief that digital recording and reproduction media are improving every year—something to tempt audiophiles for years to come!

William H. Phillips  
Vernon Hills, IL

The wonderful clarity  
Editor:  
I just heard a radio interview with the male vocalist from the Fleetwoods, the feathery singing group from the skinny-tie era of rock. He was marveling at the wonderful clarity of the new CD reissue of their tunes. “We would rustle paper, we could hear breathing, … Bonnie played guitar over in the corner to keep us in rhythm, and you could hear her fingers sliding on the strings … but that’s all gone on the CD; it’s amazing. … it’s like from outer space or something.”

Sure is. All the things that brought me into hi-fi were gone, and I’m ticked.

Maybe some fool really thought that he should take this stuff out somehow. Maybe it just doesn’t survive on CD. I could believe either explanation.

When I was servicing electronic musical instruments for a living, I’d spend a lot of time retubing and blasing guitar amplifiers. These aren’t the most high-fidelity devices in the world, but their power amplifiers weren’t too different from the tube hi-fi jobs of yore.

Now, one of the procedures that was very well-defined was the process of setting the correct idle current of the output tubes. You fed a tone into the amplifier, and starting from the lowest setting, increased the idle current until your output waveform was smooth and straight as it crossed zero. Too little current and you’d get a hitch at the zero point. Too much and you’d get smoke.

Some guys were really vehement about this. Forget the tube charts. Forget the specs. Just look for an undistorted output swingin’ from the positive half of the wave to the negative half, and you had it right. The only trouble with this was that it didn’t give you a very good-sounding amplifier. Nothing you could put your finger on, just that the amp sounded dull and you couldn’t really get into playing through it.

Well, it didn’t take too many of these experiences before I went and set up an amp with a guitar and speaker plugged in. What I learned was, as the Big B would say, nebulous but crystal-clear.

I’d set the bias so the wave looked good. Blah. I turned the signal way down and the scope way up. Cranked up more current. Blah. Turned it up. Turned it up. All of a sudden, a faint background of hum and noise came in, as it had been squelched all this time. And. so help me, that guitar just came alive. It was like taking off year-old rusty flatwounds and stringing up a new set of today’s super-responsive strings. You could just brush a string with your hand and hear all kinds of harmonics swirling around in there.
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And this was with a junky 12" speaker. And it didn't really matter what volume I used to do my setup. You just had to get the amp tight onto all the tiny little stuff around zero.

So where are we going with all of this? Here: My experiences with zero-crossing behavior in amplifiers sound an awful lot like some of the complaints we hear about CD sound, don't they?

I say, and this is conjecture, that the use of a linear conversion scale is dead wrong. In fact, and this is conjecture, whoever it was who decided on a linear conversion scale is an idiot. If a true log scale was too radical, they should have drawn a curve between a log and a line and used that. Much of the detail that makes hi-fi is certainly lost in a system that doesn't closely resolve around zero, and you can't get it back. What would you do, synthesize the finger sounds?

Perhaps some engineering group ought to look into this. Imagine a semi-log 96kHz system recording nice, fat, permanent data on a metal Beta cassette.

That background noise (aka 'ambience') is essential for anyone who likes music played by humans. It puts you at the performance like nothing else. I believe that CD can't pull it off and that's just tuff for us. **Hilary Paprocki**

Rochester, NY

**CD rot forever?**

Editor:
I have been following the "tweaking" of compact discs in these pages for the past several issues. I believe that Mr. Nixon [May 1990, p.35; September 1990, p.11] may be suffering the same problems that I have with older CDs, except that my problems are not Armor-All-related.

I decided to "green" and Rain-X my collection last month. I have never before washed or treated my collection. I have noticed that every CD over five years old, except for Sheffields, possesses the milky-looking blotches that Mr. Nixon's CD exhibited. Every CD I own was bought new, so there have been no possibilities of someone else treating them. And yes, several of the older CDs are unplayable.

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3 Unfortunately, while the idea of logarithmic quantization, which increases in definition as the signal goes down in level, is very appealing, it's my understanding that the errors due to a non-perfect logarithmic quantizer are even more subjectively unpleasant than those typical of a conventional linear device.

---

I believe that the music industry again has duped us when it comes to "perfect sound forever." I am currently doing some investigative work to find the pressing culprit, and will report on these findings later. My conclusion is that you don't have to put anything on a CD: it will self-destruct without any help.

On another note, the time has come for another reader survey. My software buying habits, thanks to yard sales, closeouts, and flea markets, have reversed my purchasing to 100 LPs to every one CD. This change was surely not the case two years ago. I have seen the light, and I don't like it.

**John F. Goad**

Apopka, FL

**Polycarbonate under attack**

Editor:
The intent of this letter is definitely not to further fuel the controversy over whether or not to treat CDs (with polishes and the like). However, I would like to comment on JA's discussion, on p.39 of the August issue, concerning the polycarbonate of which CDs are made. While polycarbonate does exhibit tremendous tensile strength and durability (as evidenced by its use as bulletproof glass and power-tool housings, etc.), it is, in fact, one of the least inert resins used in plastic products. Oils, greases, and even basic (pH) detergents can easily attack the surface of the plastic, thereby affecting the optical clarity for which polycarbonate is known. My company has been manufacturing quality plastic laboratory products for over 40 years. We use nearly 30 various resins (plastics) in 82 molding grades. While polycarbonate is widely used in our product line for items requiring strength and optical clarity, it is never recommended for use in products where good chemical resistance is needed. This is, of course, distressing, as I have compared identical copies of treated and untreated CDs (using rings, polishes, or green edge), and preferred those treated. However, until products especially formulated for safe use on polycarbonate CDs are devised, you won't catch this audiophile subjecting his discs to anything other than a clean/damp cloth! This all goes to show you: My Grandfather was correct when he told me, years ago, "just because you can hang a nail into wood with a blob, that doesn't mean you can polish the blob with a vinyl protectant." Hmmmm . . . . (Got that, JA?)

**Christopher T. Evans**

Towson, MD
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Stereophile, Vol. 12. No. 10

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Editor:
This marks my third Bob Carver outburst via Stereophile's "Letters" column. But the good Editor, ever the provocateur, will doubtless print it, given his fondness for keeping the pot simmering.

A chap named Brian Ballance disclosed in the August 1990 issue that another chap, A. Randal Bingham, may have had sub rosa reasons for tub-thumping for Bob Carver. It seems (I've no reason to believe that the facts are other than stated) Bob gave A. Randal stuff to evaluate without ever exactly asking that it be returned the next day. As "Letters" readers are well aware, I've thumped tubs for Carver too, and similar charges might easily have been laid at my doorstep by an ill-intentioned acquaintance or friend: the Silver Seven-t mono amps I've carried on about function at my digs on long-term loan. In other words, I haven't paid for them. Matter of fact, Bob wanted me to have speakers as well—heard his Silver Edition in a showroom and was quite blown away and told him so—but I declined: I'm an Allison buff and will probably so remain into perpetuity or death, whichever comes first.

Bob's a spontaneous, openhanded gent, but whether this spontaneity arises from a giving spirit or caniness I'd not care to speculate. Suffice to say, Carver's not an idiot. Suffice also to say, were I the least dissatisfied with the SS-ts, I'd have returned them. As a record reviewer of audiophile stripe, I need to feel secure in the belief that the equipment I use conveys as accurate a sense of a recording's engineering as playback hardware allows. Without intending to sound any more arrogant than is absolutely necessary in order to make the point, I can afford just about anything the high end has to offer (and live in the shadow of a not-insane wife's potential for just wrath). That I have not sprung for replacements for my SS-ts addresses what I think of their merits, no less milady's lungs. I love her and them, and that's all she wrote . . .

As I've mentioned before, I've little patience for subjectivism in audio hardware evaluation. It leads to interpretive creativity. I suggested in the past that the SS-ts be scrutinized by way of blind testing. The idea has been brushed aside, as would be a loaded revolver by someone uninterested in shooting himself. Whatever you've got, dear Stereophile reader, if it sounds good keep it, or replace it with something better yet. Ascension, like space, is without end. God bless you. Feed the finch.

Mike Silverton
Brooklyn, NY

Those graphs . . .

Editor:
Oh, about those graphs . . . what, exactly, am I to make of them? Sometimes the squiggly line goes up, and that frightens me. Sometimes the little line points down and, well, my eyes follow and . . . I'm embarrassed to say that my socks are mismatched again. A common audiophile problem. In every issue I search without success for the dot that says "Katmandu" on those MLSSA plots. If it's not the Himalayas, I demand some indication in the future of where those summits are. (Hey, you'd have a poor in-room response, too, if two Krells pushed 60 amps peak-to-peak into your point source. Lucky that my screams have been dithered.) I've found that squarewaves are painful to hear; forgive me if I prefer the rounder sound of Handel. The step response of that speaker is good, but Fred Astaire was better. And will someone close the 5ms impulse window? I feel a cold draft coming in from Sony and Philips. Ahhh . . . thanks, that's better.

Perhaps the graphs should be more numerous and bigger. Pop-ups, maybe.

William Smith
Somerville, MA

Us vs them?

Editor:
I have a serious question for you that puzzles me and, I assume, many of your readers.

In the August issue (p.100), the "best sound" listing from your New York show attendees had Definitive Hi Fi's Wilson/Krell setup at #1, the Duntech/Jadis/Wadia combination at #2, and Shahinian/Bedini at #3. Much further down the list came Burmester/B&W (#8) and Michael Hobson's Avalon/Rowland room (#9). And yet, just prior to the listing came the show reports from Tom Norton, Guy Lemcoe, J. Gordon Holt, and Clark Johns on. The first three, equipment reviewers all, each mentioned the Burmester/B&W and Avalon/Rowland as their choices for "best sound." More interestingly, two of the four specifically mentioned the

4 Don't worry, I've re-upped for three more years. More KGH, please.

Stereophile, December 1990 31
The Mirage M-1s have garnered their fair share of raves from the industry. They've invoked such comments as "I'm completely bonkers over this product." and "The M-1 is and will be for many people their absolute reference."

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Dunitec/Jadis/Wadia rooms as among the least satisfying, while Gordon expressed disappointment with the Shahinian/Bedini room and Tom was noncommittal.

While the consistency among the reviewers was an encouraging result, the apparent differences of opinion between the reviewers and the attendees are fascinating; I was wondering if you would or could make any comments on these disparities. Jack English
Watchung, NJ

You got me, Jack. A related but somewhat different question was put to me recently by a retailer. "Why," he asked, "have reviewers for all the high-end magazines embraced the idea of separate D/A processors and transports when their readers continue to buy one-piece CD players?" I can only conjecture that the answer to these questions involves reviewers either being more critical than the average audiophile, or forming a subset of audiophiles with somewhat different needs/tastes, or a combination of the two. —JA

Music, magazines, & tantrums

Music, magazines, & tantrums

Editor:
Over the last several years I have become increasingly distressed by what I term "the odd audiophile attitude" about music. It seems that most audiophiles spend their time listening to speakers, cables, cartridges, tonearms, processors, this modification or that tweak, but never listen to music. This attitude was recently summed up in your magazine (Stereophile, August 1990, p.99), by Clark Johnsen's scarcely facetious comment, "$\ldots$ music is a damn distraction from audio."

I consider it an obscene affront to my aesthetic sensibilities when I witness people spending multi-thousands of dollars to audition equipment and sound who seem to have lost virtually all appreciation of music itself. Music's emotional beauty is virtually ignored; instead, there is an undue intellectual attachment to technological hardware, data, and measurements. This "odd audiophile attitude" seems to embody a 20th-century machismo. Today's audiophiles are men who have put down their fists, but now exchange volleys of verbal aggression... .

I myself try to overlook the tiresome machismo, the strutting and posturing, the "mine is bigger than yours" attitude. But when reading Clark Johnsen's aforementioned article, I could scarcely ignore his macho swagger when he bragged how, at the recent Stereophile High End Hi-Fi Show, he said to one ignorant questioner, "Listen: just leave. Do it right now!" He also described a hot exchange with a Richard Simon, and with considerable animosity emphasized that Simon was "in his late 50s and with his stomach spilling out a foot over his belt." Their argument climaxed with Johnsen saying, "Mister, yer head is too fat, like yer stomach. You are stupid and overweight all over. Get outta here!" This argument was supposedly resolved on a cordial note, but Clark Johnsen nevertheless felt compelled to reiterate his boorish ad hominen arguments. The end result: dull, perverse writing that was neither entertaining nor informative.

Please, Stereophile, you are trying both the patience and loyalty of your readers. Sometimes your magazine seems scarcely humane, much less user-friendly. Can't you try for a better approach? Francis Bauml
Murphysboro, IL

Wadia vs Theta

Wadia vs Theta

Editor:
The August issue of Stereophile, with its very favorable review of the Theta D/3Pro Basic compared with the Wadia X-32, left me in a deep depression for four days. Being a recent and pleased Wadia owner, I was very anxious to now audition the Theta.

To reduce my anxiety, I went to a Theta dealer for a chance to home-audition the unit. Although the dealer only featured the top-of-the-line Theta Pro model, I listened to their system consisting of: Quicksilver valve preamp, Philips CD, Theta Pro D/A, and Mentmore monoblock tube amplifiers feeding a pair of Clements RB 8.0 Mk.II speakers. The entire system sounded wonderful: smooth, transparent, wide soundstage, depth, etc. The dealer then insisted that I listen to a pair of $3500 Merlin International speakers through the same system. They were a big disappointment—soundstage was confined to the speakers' left and right, depth was limited to slightly behind the speakers (like a "picture frame"), and they were also very harsh and bright. I sat there wondering, why wasn't the Theta doing its job? Is it the Theta? Could the speakers alone make such a dramatic change?

After considerable thought, the message became apparent to me that the complexity of
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delivering audio/sonic quality is governed by the components' compatibility, [their ability] to form a system that will please the listening taste of the consumer. Therefore, it raises the question: could the equipment used in the August review have been a better match for the Theta than the Wadia?

Although I never got a chance to take the Theta DS Pro Basic home for an audition and compare it with my Wadia, the pleasure I get from my audiophile system is immense! Would the Theta have done a better job? Who knows, but I'm no longer a depressed Wadia owner!

Robert A. Golembe
Pittsford, NY

PS. Isn't this a fun hobby? Thank God it's not a science!

Hearing vs reviewing
Editor:
Anthony Molfetta ("Letters," May 1990) seems to feel that "if a reviewer's high-frequency range is limited," by age, he implies, "this deficiency [may] impede the reviewer's ability to perceive with accuracy the realism of music."

However, a subjective critique of audio equipment does not judge the realism per se of the reproduced music, but rather its accuracy compared to music performed live. If a reviewer hears nothing above, let's say, 12kHz, he will not hear extreme HF either in his listening room when assessing components or in a concert hall. In other words, he could still be perfectly capable of comparing what he hears through an audio system to what he hears regularly (one would hope) at concerts.

Only when a component is capable of reproducing accurate bass, accurate mids, and accurate lower highs, but fails apart in the extreme upper frequency range, might a positive review by said writer perhaps be considered misleading. And even then, this would only make a difference to those (un)lucky few whose hearing extends toward that of the average canine.

Russell Lake
Toronto, Ontario, Canada

Frank vs original instruments
Editor:
Mortimer H. Frank's persistent attacks on the original-instrument performance movement have not only become tiresome but downright irritating. His latest, on Christopher Hogwood's recording of Beethoven's Symphonies 7 and 8, was the last straw.

I have owned over a dozen Beethoven cycles during my time—including my previous favorite, Toscanini's magnificent cycle with the NBC—and far from finding Mr. Hogwood's efforts "characterless" and "ugly," I think his is not only one of the best I have ever heard, but, to my mind, captures the essential spirit of Beethoven as no other cycle before or since.

Why, after more than 200 years, will people not accept Beethoven as Beethoven? Why do they try to make him into Mozart or Haydn or Weber or Brahms? The "coarse" and "crude" manner which Mr. Frank refers to in his review was, from all accounts, part of the man's personality. His contemporaries didn't like it then and people like Mr. Frank don't like it now, but I'm sure Beethoven would have laughed out loud with contempt at that attitude. I can only thank the gods that Mr. Hogwood and a few others have allowed this perennially misunderstood composer to finally come to life.

There is a ferocity, urgency, even a rage in the music of Beethoven that no other composer possesses, and to strip the music of those qualities is to deny its essential emotional message. Perhaps Mr. Frank is simply afraid of Beethoven, and feels more comfortable listening to him with his head buried in sand. But for my money, if, at the end of a Beethoven performance, the instruments aren't broken, the piece has been played without sufficient apassionata. And if you think I'm being frivolous, remember Beethoven's own instructions regarding the playing of the "Hammerklavier" sonata!

For those who care, I highly recommend the book Beethoven and His Nine Symphonies, by George Grove (Dover 1334), a profound and loving look at the composer's most influential body of work by one who was almost literally in earshot of the original "original-instrument" versions. It includes the famous account by Ludwig Spohr of Beethoven conducting his still controversial Symphony 7, which should give the reader a very clear understanding of the way its wild and crazy creator intended it to be played.

Peter Reichelt
Flushing, NY

Absolutists vs original instruments
Editor:
Q: If Beethoven, Berlioz, Bach, Schubert, et al...
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had had the modern symphony orchestra available to them, wouldn't they have written for it?

A: Of course.

Q: Then how do you justify the "original instruments" movement? When the modern symphony orchestra plays the music of older composers, aren't we really doing them a posthumous service by giving them a sound that they would have liked to have used themselves?

A: If they had written their music for modern facilities—modern orchestras, instruments, halls, and dispositions. Had they been writing for the modern facilities, their music would no doubt have been equally superb, but adjusted to the modern facilities.

Q: How would they have changed it?

A: Those guys were geniuses. What they produced was dictated by perceptions that were uniquely their own. We shouldn't even try to guess what the changes would have been. All we can be sure of is that the music would have been different.

Even in their own time, they were always adjusting to the situation at hand. Take Schumann, for example. Didn't he double the winds in his symphonies to compensate for what he perceived as deficiencies in the orchestras that were playing them? And we know that Bach, Haydn, and Mozart wrote for the forces at their dispositions. They didn't ride into town with a manuscript and refuse to play it unless the local management found them an orchestra to fit. They wrote to fit what they had.

Then there's Beethoven griping about the pianos. Yes, I'm sure he would have loved to have had a Steinway to play with. But if he had, he could not conceivably have written the exact same piano concertos that we have today. His sense of rightness would simply have not permitted that.

Q: Does that mean we should not attempt to play older music on modern instruments?

A: The bottom line is that, even when this music is abused by being played with modern resources, it is stunning. Furthermore, until the day comes when every community has an original-instrument group in addition to the standard orchestra, we either hear them as misplayed on modern instruments or we hear them not at all. And not hearing them is not an acceptable option.

However, I will say that I think we should rethink some of our current practices. The one that gripes me most is the change in pitch. When I was a kid, most orchestras in this country tuned to 440, except for the Boston Symphony, which tuned to 444. Now I think that we are routinely sliding up past 444. One of these days I expect to see all the fiddles in the whole fiddle section start folding in half in the middle of a concert from the tension.

Q: But what about the charge that most original-instrument performances are dull and lifeless, and unpleasant to listen to?

A: That's certainly true. But we must add that most modern-orchestra performances are dull and lifeless, and unpleasant to listen to. For example, in 50 years of listening to the Franck Symphony in d, I have heard exactly three interpretations—Barbirolli with the NYPO, Stokowski with the Philadelphia, and Monteux with the CSO—that thrilled me. The rest, including those by such "giants" as von Karajan and Cantelli, either bored or angered me.

But maybe I am extreme. Okay, just read a lot of music reviews of modern-orchestra performances, and see that a great deal of them are negative and, furthermore, many times the same performance will get good reviews from some reviewers and poor reviews from others. So, first, who is to be the arbiter of whether or not original-instrument performances are good and, second, if we are to oppose original-instrument performances because a high proportion of the performances are not good, shouldn't we also judge modern performances by that same criterion and oppose them?

But, actually, you're out of date. The current charge is that original-instrument performances are now too good. The idea is that musicians then were not as good as they are now, so when the original-instrument groups perform they are not authentic because they sound too good, and "Beethoven never expected to hear his music performed like that."

Q: Well, isn't that true?

A: The curse of music is the absolutists: "Toscanini, Reiner, and Szell are good; it is virtuous to listen to them. Stokowski and Walter are bad; it is wicked to listen to them." The absolutists are incapable of understanding degrees, and the original-instrument movement is a matter of degrees. The original-instrument movement is bringing us several degrees closer to hearing what the older guys wrote. We may
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be even closer or we may not. Even if where we are now is as close as we ever get, it still sounds much more "right" than the way we did things ten years ago.

Q: But do you accept the fact that we do not, and will never, know everything about the performance practices in effect at the time this music was written, and therefore will never be able to have totally authentic original-instrument performances?

A: Yes. But even with contemporary music we don't get "totally authentic" performances.

For example, for 50 years virtually every review I ever read of a Stravinsky performance (that is, Stravinsky conducting his own music) pointed out that he was not as good a conductor of his own music as various other conductors. So, if the composer himself can't produce an authentic performance of his own music, is an authentic performance possible?

Now we hear that Bernstein and Slatkin do Copland's music better than Copland, that several modern pianists play Rachmaninoff better than Rachmaninoff, that any number of conductors play Mahler better than Bruno Walter, who was Mahler's protégé.

Then, of course, there are national differences. Since the French horns in Russian orchestras have a unique sound, we cannot play Tchaikovsky and early Rachmaninoff as they intended. French oboes have their own timbre, so we cannot play Ravel and Debussy.

And what about the fact that concerts in Beethoven's time interspersed other compositions between the movements of symphonies?

And so it goes. What I cannot understand is the vehement opposition to original-instrument performances. It started up with the issue of the first original-instrument recording I ever bought, which was Theodora and Richard Schultz (forgive me, I may have the names wrong) recording the Handel Water Music, and it has been unremitting ever since. It is not that the opponents do not want to listen to original-instrument performances; it is that they want to obliterate them. Hey, give me a break. Nobody is saying you can't hear what you want. Just be more reasonable about what I want.

Paul A. Alter
Hyattsville, MD

Beecham vs stereo
Editor:
In his otherwise excellent March 1990 "Building a Library," Denis Stevens is unfortunately incorrect when he asserts that Sir Thomas Beecham "made a stereo test tape in Ludwigshafen while touring Germany with the London Philharmonic in 1936." It was not stereo. It was mono.

This recording of the third movement of Mozart's Symphony 39 was apparently recorded on an AEG Magnetophon Model K2, Serial Number 1028, on 19 November 1936. Although that machine has been slightly modified during repairs over the years, it was—and still is—mono. It appears that the Germans did not experiment with stereophonic tape recording until the last years of World War II.

Beecham had, of course, made a stereophonic recording prior to the aforementioned tape. This was the opening movement of Mozart's Symphony 41, recorded in Abbey Road Studio 1 on 19 January 1934 on disc by Alan Blumlein. In all probability, it is the issue of these two recordings on World Records Retrospect Series SH 1008 that probably confused Denis Stevens. Anthony Griffith's liner notes are uncharacteristically vague in crediting the form of the original sound carriers, and the disc's labels are of no help—they list everything as mono!

Michael Bell, Ph.D.
Associate Professor, Radio-TV Past President, Association for Recorded Sound Collections, Morehead, KY

Part of Beecham's 1936 concert at the I.G. Farbenindustrie Concert Hall in Ludwigshafen was released in 1984 by Chandos as part of a 3-cassette box (DBTB 2007S) to commemorate 50 years of tape recording. The box includes 1936 recordings of Delius's On Hearing the First Cuckoo in Spring, two excerpts from Rimsky-Korsakov's The Golden Cockerel, and the middle two movements of Mozart's Symphony 39, all of which are definitely monophonic.

—JA

VTL helps
Editor:
In one of the past issues of Stereophile, there was some concern about the communications with the VTL company. I wish to help eliminate some of the concern with the following:

I have been interested in purchasing a VTL amp and had some questions concerning which amp to buy. On August 20, 1990, I called the company in California and spoke with the
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secretary. She informed me that the representative I needed to talk with was on the phone and she proceeded to take my phone number. I told her I would hold and she was quite concerned since I was calling long distance. I held for a few minutes and she informed me that I would receive a call back. At this point in time, I thought I was being put off and left my office to go home. I was home for only ten minutes and a call came in from a Luke Manley.

The interest he showed was quite commendable. He made me feel very comfortable about any question I had, no matter how simple it may have appeared to him. I feel that this company will go quite a long way in this industry because there is that concern.

William R. Piro, DDS
Dix Hills, NY

Modjeski & VTL
Editor:
Roger Modjeski put his own credibility at serious risk with his slash at David Manley and VTL in your "Manufacturers Comments" column (Vol.13 No.9, p.219). If Roger has to ridicule and make tasteless negative criticism like this about his competition, he must feel that neither he nor his products can stand on their own merits.

As an engineer in the broadcast electronics field and a long-time VTL user, I have no doubt as to who is the front-runner in the design race.

Robert D'Amato
Nine Mile Falls, WA

Modjeski & STR
Editor:
"STR," when referenced to Sylvania vacuum tubes, is not a "marketing sobriquet." [See Roger Modjeski's "Manufacturer's Comment," September 1990, p.219. —Ed.] It is a set of production test requirements imposed as a condition of sale by the purchaser. In some cases, a purchaser will add his STR to the part and to its spec drawing.

Because of the added testing, an STR number may be perceived as a premium selection.

After some 25 years of engineering, making, and selling vacuum-tube musical instrument amplifiers, I can state with some authority that STR is not marketing "hype" or "glitz," but an effort by an OEM user to obtain product usable in a proprietary application.

Roger F. Cox
Chino, CA

VTL's David Manley also responds to Roger Modjeski's letter in this month's "Manufacturers' Comments."

—JA

Koval & the Quad mods
Editor:
Together with a group of friends, we are pretty happy owners of Quad ESLs. I have just read Dick Olsher's article on the Koval modifications for the Quad and would like to get in touch with Mr. Koval. There should be an interesting market for his products here in Italy, as for Mr. Crosby's modifications of the ESL-63.

Giancarlo Settini
Milan, Italy

Several owners of old Quad ESLs have written about the Koval Mod for these classics and to obtain John Koval's address. As there are still over 60,000 Quads out there, the demand for the Mod should continue for many years to come. To satisfy the present inquiries and to forestall similar requests in the future, here's Koval's current address: Linear Acoustic Labs, 11521 Cielo Place, Santa Ana, CA 92705. Tel: (714) 838-6555 or (714) 730-9011 to leave a message.

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Japan: Peter W. Mitchell

Nowadays much of the attention in tweeter technology seems to be focused on rigid metal domes. The principal drawback of traditional soft-dome tweeters, technically speaking, is that their response tends to become irregular in the octave above 10kHz, mainly because the dome ceases to vibrate as a rigid piston. Because of its limited stiffness, only the circumference of the dome accurately follows the motion of the voice-coil. The center of the dome tends to lag behind or vibrate at reduced amplitude so that the dome becomes, in effect, a ring radiator. Even if this doesn’t cause an obvious departure from flat response on-axis, it often produces a steep droop in off-axis response above 10kHz.

Metal tweeter domes can be stiffer, so their off-axis response usually holds up better, yielding a more open and airy sound. But they have a compensating drawback: since the metal has no energy absorption to damp its vibration, the dome’s resonance is severe. The result is a large peak in response, just above the highest frequency that most of us can hear. In one of the most successful metal tweeters, the copper dome in the Celestion SL6, the resonance occurred at about 21kHz—close enough to audibility that Celestion included an elaborate notch filter in the crossover network to block energy that might stimulate the resonance. In newer metal-domes the resonant frequency is higher, typically 25kHz or so, where it might bother dogs and small children but won’t be.
heard by most adult listeners.

The frequency of the resonance depends on the ratio of stiffness to mass, so the way to push the resonance further away from audibility is to raise the stiffness and reduce the mass. That's why some manufacturers have experimented with exotic lightweight metals such as titanium and beryllium, despite the high cost and potential health risk of working with such materials. Now a couple of Japanese companies have developed a way to make a tweeter dome with a very high stiffness-to-mass ratio, using an even more exotic material: diamond. I don't mean fine-ground industrial diamond dust, which some manufacturers already use as a coating on plastic tweeter domes; I mean a tweeter dome formed of pure, solid diamond crystal.

The method of manufacturing the diamond dome is similar to the process that Yamaha developed a decade ago to produce beryllium domes. Unlike most metals, beryllium can't safely be milled, drilled, ground, or machined, because such processes inevitably produce dust as a byproduct—and breathing air that contains beryllium dust can be fatal. To circumvent that small but annoying drawback, Yamaha devised a vacuum-deposition process that could be used to grow beryllium tweeter domes like hothouse orchids. In a sealed vacuum chamber a beryllium rod was vaporized by an electric arc, producing a cloud of beryllium atoms which condensed onto a dome-shaped copper form. After cooling, the copper form was dissolved away in a chemical bath, leaving a thin dome of pure beryllium whose resonant frequency, as I recall, was at least 40kHz.

JVC is using a similar technique to make diamond domes. Methane (natural gas, a molecular combination or compound of carbon and hydrogen) is heated to 2000°C by a tungsten filament glowing in a vacuum chamber. As the methane molecules decompose, the free hydrogen is drawn off and the remaining carbon atoms condense onto a dome-shaped form, gradually building up a pure carbon-crystal (i.e., diamond) coating about 30µm thick. Later the form is dissolved, leaving a thin, clear, glassy, diamond dome. Only time will tell whether this process can be made sufficiently economical for mass-production, and what description will best apply to the sound of the resulting tweeters—the clarity of crystal or the hardness of industrial diamonds.

**US: Robert Harley**

It's inevitable that all analog-based storage and transmission media will be replaced by digital-based systems. The most visible transition of an analog format to a digital format has been the rapid demise of the LP, accompanied by the equally rapid ascent of the CD. Other examples include the upcoming gradual replacement of the analog cassette by either DAT or a consumer optical disc recorder, and Sony's professional digital video cassette recorder (the D2 format) that is supplanting the venerable 1" analog open-reel video machine.

The next analog storage medium to fall under the assault of rapidly advancing digital techniques is film sound. As reported by Tom Norton in October (p.57), rather than record analog audio magnetically or optically on a 35mm or 70mm film print, a new system has been developed called Cinema Digital Sound (CDS) that optically encodes six channels of CD-quality digital audio on the motion picture's release print sent to theaters. The theater reads and decodes the digital audio through a special CDS processor mounted on their existing projector. The film soundtrack is then reproduced through the theater's conventional playback system.

Cinema Digital Sound is the result of a joint venture between Eastman Kodak Co. and Optical Radiation Corp. The two companies spent five years and $5 million developing the system, which was shown for the first time at the Screen Directors' Guild in May. The patented system is fully developed, and CDS playback systems have been installed in Pacific Theaters' five flagship houses. The new format made its public debut (to mixed reception) in seven theaters (all in Los Angeles or New York) with *Dick Tracy*, the first theatrical feature released in CDS. By the end of 1990, it is estimated that CDS will be installed in 150 theaters across the country.

Before describing CDS and how it works, let's look at conventional film-sound technology. In the 35mm format, the audio is analog-encoded in an optical stripe alongside the picture. Dolby Stereo adds additional channels by
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2Ci Hi-Fi Answers, April 1990
Alvin Gold

"The 2Ci is one heck of a fine speaker at its price ... Always musical ... Enthusiastically recommended as an affordable loudspeaker for Everyman."
2Ci Stereophile, May 1989
John Atkinson

"You'll surely rediscover your record collection."
2W Ultra High Fidelity Magazine
Odette L Roy

"The Vandersteens make for very good listening. This is no small accomplishment!"
18 Son Hi-Fi Video
Laurent Racicot and Claude Gervais

"Soundstaging, tonal integrity and dynamics make this speaker so much fun to listen to that I kind of hate to put them away to make room for others."
18 Bound for Sound.
May 1989 Martin G. DeWoll
a matrix encoding process, resulting in four-channel playback (left, center, right, surround). The 35mm format records the audio channels magnetically, with much better sound than 35mm optical encoding. Each of these formats differ in their audio performance: So-called “Academy” mono has a frequency response of 40Hz–6.3kHz. 35mm optical extends the upper end to 12.5kHz, while 70mm magnetic further improves frequency response to 30Hz–14.5kHz. Besides starting life with limited audio performance, all these formats are subject to degradation, especially 35mm optical, as the film is handled and makes repeated passes through a projector (see Table 1).

Because the Cinema Digital Sound process is digital, its audio performance specs read more like those of a high-quality digital audio storage system. Among the claimed specifications for CDS are a frequency response of 20Hz–20kHz, dynamic range of 96dB, 0.01% THD, and 100dB of channel separation. In addition, the D/A conversion stage, performed in the theater during playback, appears to be of exceptional quality. Apogee Electronics, noted for their high-quality replacement filters for professional digital audio recorders, was commissioned to design the D/A conversion circuits for CDS. The D/A section features 18-bit, 8x-oversampling DACs, analog filters flat to less than 0.1dB with linear phase response to a fraction of a degree, no coupling capacitors in the signal path, and a custom, digitally controlled analog attenuator rather than a conventional signal-degrading Voltage Controlled Attenuator (VCA).

But how did the engineers manage to put such high-density digital data on a format never intended for the rigorous demands of digital data storage and retrieval?

The system is quite elegant. First, a special Kodak-developed stock was created with a fine enough grain to permit digital imaging of very tiny rows and columns of white and black areas (fig.1). Binary data are encoded in the black and

Table 1: Cinema Digital Sound specifications compared with traditional film sound formats

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>35mm &quot;ACADEMY&quot; OPTICAL</th>
<th>35mm DOLBY STEREO OPTICAL</th>
<th>70mm DOLBY MAGNETIC</th>
<th>70mm CINEMA DIGITAL SOUND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Channels</td>
<td>1</td>
<td>2 matrixed to 4</td>
<td>4 full-bandwidth</td>
<td>5 full-bandwidth</td>
</tr>
<tr>
<td>Dynamic Range</td>
<td>52dB</td>
<td>59dB</td>
<td>78–80dB</td>
<td>96dB</td>
</tr>
<tr>
<td>New Print</td>
<td>44dB</td>
<td>51dB</td>
<td>100dB</td>
<td></td>
</tr>
<tr>
<td>Worn Print</td>
<td>NA*</td>
<td>12–49dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel Separation</td>
<td>30–63kHz</td>
<td>40–12.5kHz</td>
<td>30–14.5kHz</td>
<td></td>
</tr>
<tr>
<td>Frequency Range</td>
<td>3%</td>
<td>0.01%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Harmonic Distortion</td>
<td>1–7%</td>
<td>1–7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Channel</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>MIDI</td>
</tr>
<tr>
<td>Synchronization Track</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>SMPTE Time Code</td>
</tr>
<tr>
<td>Film ID Information</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>ID Data Fields</td>
</tr>
</tbody>
</table>

*Note: NA = not applicable

Fig.1 Cinema Digital Sound data encoding
"...an extraordinary achievement in speaker-making."

—Larry Archibald, *Sterophile* June 1990 Vol. 13 No. 6

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white features written on a strip \( 1/6 \)" wide, an area normally occupied by analog optical or magnetic stripes. Six channels are encoded, five full-bandwidth (left, right, center, left surround, right surround) and one bandwidth-limited track (100Hz) that encodes subwoofer information. The CDS encoder converts the finished sound mix to digital at a 44.1kHz sampling rate and encodes the data in a highly modified hybrid Delta Modulation System as opposed to Pulse Code Modulation (PCM).\(^1\) Fig. 2 shows the CDS encoding process.

The data are formatted in a "run length limited" encoding scheme similar to that often used in computer hard-disk drives. In addition to the six audio channels, the bitrate incorporates overhead such as subcode, error correction, and redundant data. CDS includes a Musical Instrument Digital Interface (MIDI) data channel, a synchronization track containing SMPTE time code, and various identification fields. The MIDI channel can be used for booth and theater automation and for synchronizing theater special effects. For example, movement of hydraulically controlled seats can be synchronized with film images. The data are inter-leaved and error correction encoded, resulting in a serial bitstream of 5.5 million bits per second. Of this, approximately a third is dedicated to overhead. For comparison, the raw data rate from a CD is 4.3218 million bits per second, of which 1.41 million are audio.\(^2\) A powerful Reed-Solomon error-detection and correction scheme developed for CDS by Cyclotomics, a Kodak-owned company, addresses the specific types of error encountered in the format. Raw bit errors are approximately four in 10,000, but the error correction can correct error rates as high as one in 100. The decoding algorithm has been incorporated into custom VLSI chips in the CDS playback hardware. The CDS decoding system (fig. 3) includes an optical reader that picks up the digital data from the film, and decoding and error-correcting electronics. The CDS playback system's analog outputs are then routed to the theater's existing audio system.

Because CDS is digitally based, it can accommodate future innovations. For example, data-compressing techniques are being developed to encode additional languages in the dialog track simultaneously, allowing one universal print for worldwide distribution. Of course, the music and effects tracks would remain the same.

While other methods of delivering digital audio with film have been developed, CDS is the first digital system for film sound in which the audio is encoded directly on the motion picture itself, adjacent to the film image. When I worked in CD mastering, I was involved in making specialized CDs for a six-channel audio playback synchronized with film. Although other digital film-sound systems have been successful in special-venue theaters, CDS has the advantage of requiring only a $15,000-$20,000 investment by the theater owner to retrofit his existing projector, which doesn't preclude the projector from showing conventional films. In addition, the CDS system involves the least amount of change in film production, post-production, and playback. The cost of making a CDS negative is comparable to creating a 35mm Dolby stereo negative. A flat licensing fee is charged to producers for encoding the digital sound negative.

Although I feel digital audio is still far from

---

1. Rather than assign a 16-bit number to represent the analog waveform's voltage at each sample time, the Delta Modulation System encodes only the difference between samples. The data rate is thus greatly reduced due to the high degree of correlation between samples in an audio waveform.

2. This figure is obtained by multiplying the sampling frequency (44.1kHz) by the quantization word length (16) by 2 (for two audio channels).
AKG has designed new reference headphones: the K 1000. It was clear from the start that natural spatial reproduction is only possible without any ear cushions that would change the sound. This was the idea.

Based on unbiased studies of all transducer types, AKG chose the proven dynamic transducer. However, AKG has updated this concept by developing a new type of magnet assembly called the VDL (Ventilated Linear Dynamic) magnet, using laser interferometry, and coating the diaphragm with an organic violin varnish formulation that has been in use for centuries.

The way in which state-of-the-art audio technology has been put to work in carrying out a revolutionary idea placed the K 1000 in the "Reference" class in all reviews that appeared to date.

Listen to Reference at the selected K 1000 dealer nearest you.
perfect, I believe Cinema Digital Sound will be a vast improvement over existing media. The decision to incorporate high-quality D/A converters and reconstruction filters is a promising indicator of the system's overall sonic performance.

**US: Peter W. Mitchell**

The hot topic these days in business school is M&A (mergers and acquisitions), and as reported in last month's "Final Word" column, that activity has lately produced some surprising marriages among audio companies. Although Harman International's, the audio conglomerate that owns JBL and Infinity, purchase of Madrigal (maker of high-end Mark Levinson and Proceed electronics) fell through, a British food distributor named Polly Peck International bought Del Monte (the canned-fruit producer) and then took over Sansui, becoming the first non-Japanese owner of a major Japanese electronics company. Sansui, in turn, recently bought England's high-end Mission Electronics and is expanding Mission's US distribution. Philips, which already owns the Marantz name outside of the US, has bought it from Dynascan for a reported $8m. Jensen, the Indiana speaker maker that already owned Advent and Phase Linear, bought two more speaker companies: big Acoustic Research and little NHT (Now Hear This). In one of the oddest mismatches, Clarion, the Japanese car-stereo producer, bought McIntosh Labs, the "Rolls Royce" of old-line American high-end audio (a company that magazines tend to ignore because it doesn't send out review samples). Now Polk Audio, the Baltimore speaker company, is engaged in a stock-swap merger with the British owners of KEF and Meridian, aimed at giving Polk access to KEF's distribution channels in Europe and giving Polk a European manufacturing facility. Whew!

**Hong Kong: Ken Kessler**

A number of firsts for me: my first visit to Hong Kong and my first visit to the Hong Kong High End Hi-Fi Show. Then again, I couldn't have gone to the latter before, as this was the show's premier. But, as you can imagine, I had no idea what to expect.

Neither did the organizers. The September '90 show was put together by *Audiophile*, Hong Kong's No.1 hi-fi magazine and one of my employers. Considering that the crew had never organized a show before, it ran smoothly and was successful beyond belief. But maybe that's to be expected in Hong Kong, the only place I've been where things are done instead of talked about, and where "service" is performed with speed, style, and grace. Slick? This show was exemplary on every level bar the humidity, but even *Audiophile*'s Y.K. Chan can't control the weather.

For starters, your HK $80 (around $11 US) got you a metal badge which enabled you to come and go as you please. Then you were given a free 3" CD produced for the show in conjunction with JVC. Last and hardly least, you received a gorgeous, full-color, 200-page show guide containing everything you wished to know about the 120 brands spread over three floors and 28 rooms.

Unlike other shows, the Hong Kong affair's exhibitors were almost entirely distributors rather than manufacturers. You'd find Krell sharing space with JBL and ATC with Aragon, for example, as almost all of the importation in Hong Kong is handled by independents rather than by wholly-owned subsidiaries. To further complicate matters, some distributors also own retail outlets, but there seems to be some form of gentleman's agreement which prevents this from creating conflicts.

Also unlike other shows was the lack of a trade day, probably to be rectified in the future. Indeed, trade dealings were almost impossible for those who flew in from the Philippines, Taiwan, South Korea, Singapore, and other Pacific Rim territories because the show was one of the most well-attended I've ever encountered. Official numbers gauged by sales at the door tell us that 21,000 audiophiles were in attendance. Unofficially, it's reckoned that the badges were handed around enough times to swell the figures to more than 60,000.

While this created congestion which no Westerner could stand—+30 people in hotel bedrooms smaller than you'd find in the West—it didn't seem to bother the locals. They'd sit attentively, listening to systems with the speakers no further away than 3' from the front row. And what this, plus the numbers,
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How Hong Kong audiophiles listen at shows

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JBL's high-end Project K2 flanking Krell

Audio Devices' phono amp

The Ben David Model 23 power amp

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Stereophile, December 1990
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revealed to me is that the audiophiles of Hong Kong are far more enthusiastic, far more serious, and far less jaded than their cynical American or European counterparts.

What they came to see and hear was a gathering of weird and wonderful high-end components, with only a few middle-of-the-road makes taking up precious floor and shelf space. Surprisingly, there were a few product launches which I hadn’t expected, as I’d assumed most brands saved their thunder for CES, Tokyo, or the major European shows.

I could only discover two native brands, tube gear from Sound Audio and solid-state from the Hebraically-named Ben David & Industrial. Sound Audio struck me as a sort of Far-Eastern Croft, only with decent aesthetics (and a choice of silver or black finishes), the company selling a preamp, power amp, and a pair of Dick Sequeria–sourced loudspeakers as a package for less than US $2000. (Yes, you read that correctly.) The VP-3a Tube Line Amplifier is a smartly styled control unit offering volume, balance, tape monitor, and four line-level inputs, while the HBP-50a is the matching 2x50W tube/MOSFET power amp in a chassis with the same width and height but slightly greater depth. What’s remarkable is that this bargain-basement pairing sports such designer goodies as ALPS controls, Wima and WonderCaps, Dale Resistors, and gold-plated ceramic tube sockets. The gear sounded fine at the show, given that it was in one of the most crowded rooms of all.

Behind closed doors, Sound Audio also showed an early sample of the forthcoming 2x180W hybrid power amplifier (to sell for HK $26,000) and a prototype minimonitor sporting a Focal tweeter as employed by SOTA and Wilson. This should appear sometime in 1991, with the big amp due later this year. Other goodies on show included the HPB-60a 2x60W hybrid power amp and the Symmetrical Line Driver — some sort of outboard 20 ohm buffer stage, I think — which certainly enhanced the sound of the CD player they were using.

Ben David’s catalog consists of massive power amps and a preamp, looking uncannily like Mark Levinson gear, right down to the logo. The Model 12.2 preamp is a dual-mono design of the minimalist school, while the power amps are said to operate in class-A under all operating conditions. The No.23B Dual Monaural Power Amplifier is rated at 2x150W into 8 ohms, or 2x600W into 2 ohms, while the 22B is said to deliver 2x260W into 8 ohms or 2x1000 into 2 ohms. The styling is butch, the construction superb, and the componentry of the pur sang variety.

A treat for me was the appearance of a Euro-brand which has no presence in the UK or the US; I got the impression that Hong Kong could take all they could muster. Swiss Physics has been around for a decade, producing hand-crafted gear which reflects the nature of the name. Yes, this is the kind of hardware which would emanate from the Audemars Piguet or Pignons Alpa factories if they ever decided to enter the world of hi-fi. The Model 5 preamp and the 2x150W Model 6A class-A Dual Mono Power Amplifier have actually been around for a while, but this was the first time I was able to hear them rather than merely drool over an advertisement.

The products are compact, both housed in 435mm W by 130mm H by 375mm D chassis clad in the most beautiful wooden sleeves ever to grace a hi-fi component. The knobs and switches are of the “high tactile sensation” type, and even the most jaded tweaker will find him or herself reverting to novice status by switching and twiddling the toggles and dials for whatever excuse comes to mind.

Despite the luxury, Swiss Physics is a conservative company, and the designer’s attitude toward class-A is such that he states without embarrassment that the amp goes into class-A/B above a certain level. His argument is simple: no amplifier with the ‘6A’s dimensions could dissipate enough heat to remain in true class-A, and the compactness is as much of a mandatory feature as the performance.

The company’s commitment to avoiding the “beehemoth” school of high-end design is undermined, though, by the product which had its world debut at Hong Kong. The 12A is a massive beast rated at 2 x 500W RMS into 8 ohms, with 2500W capability into 1 ohm. As this sucker can be bridged, it’s doubtful that you’ll find a speaker it cannot drive. Expect the company to unleash the 12A within the next few months.

Equally impressive was a Japanese-made system containing a preamp, monoblock power amps, and a phono amp, selling for a cool HK $1,000,000. My maths tell me that this million-dollar package still translates into a heady US

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$135,000, enough to make Audio Devices' gear the most expensive on the planet. Whether or not it performs like a million clams is irrelevant: you'll want to own it once you've seen it. The styling is such that you'd expect it to sport tubes, but it doesn't. Bearing cream (I hope they're not real ivory) faceplates and gold trim, the Audio Devices components could be used on the set of any 1930s film and none would be the wiser.

What you get for the getting is a preamp with polarity inversion, tape monitoring, five line inputs and volume control, power amps with their own input-level controls, and what looks like the most complex RIAA stage ever built. Wiring is PC-OCC, the volume controls are true stepped attenuators, everything which can be gold-plated is gold-plated, and the construction is beyond belief. Unfortunately, the brochure is in Japanese and there are no spec tables to aid this gaijin, so I don't know what the rating is or what supplies the motive force, but I'll bet it's leading-edge—even the Japanese aren't bold enough to think that audiophiles can be gullible enough to spend such money on dross.

The Hong Kong Show also provided the opportunity for a last lingering glance at Gryphon's limited-edition preamp, a four-box, true dual-mono masterpiece which has reached the end of its 100-unit production run. To give you some idea of the health of the high end in Hong Kong, the distributor sold 20 and said that he could do another 40, but the Danish company won't break faith with the 100 audiophiles who were inspired to buy because of rarity. Not that it will do you much good, I should mention that the Limited Edition employs a 24k gold-plated busbar star earthing, an extensively filtered AC supply, 100% "galvanic isolation" of the cabinets, complete non-magnetic, true dual-mono construction, custom-made C-core transformers in the power supply, and a host of other non-cost-effective luxuries.

An American brand new to me, Soundsmith Inc., had a big display filling a wall with tall, slim enclosures. The designer is obviously a fan of the BBC's Dr. Who, having dubbed the operating principle as T.A.R.D.I.S., though in this instance it stands for Thompson Aligned Radius Directed Impulse Source. I think this refers to the speakers' concave baffles, which focus the drivers on the listener.

The sexiest speaker of all, though, is one which could wrest the beauty title from my personal faves, the Sonus Fabers. The Venture Charme and L'Aventure are smallish two-way speakers suitable for mounting on tall stands, the former being the larger of the two and bearing a forward-firing port. What's so breathtaking—in addition to delightfully clear and precise sound without any hi-fi edges—is the cabinetry, both models seeming to have been hewn from solid, with neat beveled edges and perfect 16-coat piano-caliber lacquering disguising the fact that the French walnut-root surface is a veneer. They're Belgian-made, but I got the impression that they're exclusive to Hong Kong. We shall see.

UK tube amplifier company Audio Innovations chose Hong Kong as the site for the launch of two new products, including the Series 200 pre/power combo offering 2x12W class-A and the Series 400 integrated amp. Arcici showed the clever "Magic Mountain" equipment rack, described by Ray Shab as "infinitely adjustable"; undeniable is its appearance, which places the units in a stepped array. I pictured some kid trying to climb one's hi-fi; Arcici should supply it with a mini electric fence. TARA Labs showed the latest versions of a number of tube models, and the company could claim that more exhibitors were using the Space & Time Cables than any others. Maybe Hong Kong audiophiles get a kick out of boxes with knobs on them dangling from the speaker terminals.

Neat ceramic cones were shown by Isopod, as an alternative to the various metal types. The NonSpeaker appeared, this curious design featuring ribbons mounted in a triangulated transmission-line enclosure. MBL from Germany showed its impressive preamp and the revised version of that iconoclastic speaker which looked like a pulsating, sectioned citrus fruit made out of metals. The Final Laser Turntable was on show as a real product, ready for sale at HK $156,000, or half the price it cost when I reviewed it some months back. I couldn't bear to find out if the company did anything about the crackles and static, so I left it with only mild regret, like after you've bumped into a former lover who dumped you unceremoniously at the altar.

It went on and on, with one room offering for sale one of the best range of "audiophile" LPs and CDs I'd seen in years. Another showed
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Stereophile, December 1990
the JBL K2 flagship model, not for sale in the US. Yet another had a vast range of caps and resistors of all types for sale, suggesting that Hong Kong’s audiophiles like to wield soldering irons.

The food was consistently brilliant. Those with deep pockets could save a bundle on real Swiss timepieces, silk, gold, DAT recorders, CDs, luggage, footwear. If the temperature wasn’t 29°C (84°F) and I could learn to cope with 85% humidity, I’d emigrate.

Here’s hoping that the mainland Chinese don’t do anything stupid in 1997. It would be a crime.

**US: Peter W. Mitchell**

The music publishers’ lawsuit to block DAT recorders failed to scare off Sony and other suppliers, so it probably will fend a long, slow path through the courts. (The Betamax suit took eight years.) Consumer DAT machines from Technics, Denon, and JVC were scheduled to reach dealers’ shelves during the fall, and others are in the pipeline. Sony’s Christmas present to digiphiles is a DAT Walkman that costs $850, weighs a pound and a half with battery, and measures just 5.8” by 3.4” by 1.6”. (Unlike the similarly small Aiwa “Strasser” portable DAT, which currently is available only through grey-market importers, Sony’s DAT Walkman has mike/line inputs and A/D converters built-in.) To reinforce the message that the DAT is just another tape recorder and not a radical new medium, Sony calls the DAT Walkman a “tape-corder,” a label that Sony has been using on cassette recorders for two decades.

DAT continues to flourish as a professional recording tool. At the fall Audio Engineering Society convention in Los Angeles, new pro DAT recorders were introduced by Sony (three machines), Panasonic (two), Fostex, and JVC. Many of these machines are equipped for frame editing, which is not precise enough for editing complex musical passages but is very useful with movie soundtracks, an area where DAT recording is catching on fast. All of the new pro DAT recorders, as well as Sony’s new digital multitrack studio recorder, are equipped with delta-sigma A/D converters whose high-order oversampling avoids both the phase-shift and imperfect linearity of earlier converter designs. (Delta-sigma conversion is also said to be less bothered by clock jitter than conventional multi-bit ADCs. —Ed.) And several Macintosh-based editors allow CDs to be mastered directly from DAT. Read on for Robert Harley’s discussion of the nuts and bolts of the Sonic Solutions editing package.

**US: Robert Harley**

At the most recent Audio Engineering Society Convention in September, a new method was proposed and demonstrated that would replace the conventional 3 4” U-Matic tape format used by CD manufacturers as the master from which discs are replicated. Rather than store the digital audio and access point (track and indices) information on 3 4” video tape, this new system creates a master CD from which other CDs are mass-produced. The new system, called “The CD Workstation,” is an extension of Sonic Solutions’ “Sonic System,” a Macintosh-based hard-disk editing system. The San Francisco company joined forces with Sony, Taiyo Yuden, and StartLab, who did the development work on the write-once CD recorder that makes the master CD.

The current worldwide standard for CD master tapes is the 3 4” U-Matic videocassette format. Digital audio data are stored as a video signal, with black representing binary zero, white representing binary one. Each horizontal line stores 193 bits, with 425 active lines per video frame. The 3 4” video format includes two auxiliary tracks normally used for audio. When storing digital audio data, one of these two channels contains SMPTE (Society of Motion Picture and Television Engineers) time code, an address that identifies the location of any event (track start, indices, track end) on the tape. These SMPTE addresses, which are translated to PQ information (track start and other control and display data) of the CD, must be entered into a computer by hand before CD mastering, a laborious, error-prone process.
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Stereophile, December 1990
In addition, choosing the appropriate track-start time is an artistic decision best left to the producer or artist. Many CD plants find the attack of the first note and call that the track beginning. There are, however, many cases where room ambience, instrumental noises, and other sounds on the recording before the downbeat contribute to the overall musical experience, especially on live recordings.

Many people within the industry dislike the \( \frac{3}{4} " \) U-Matic format: The tape is easily damaged and is prone to dropouts that cause the PCM-1630 digital processor to mute or interpolate. In addition, the error rate increases with each play, making it a less than robust medium. The U-Matic format was borrowed from the video industry more out of convenience than for its technical virtues. Despite being less than ideal for storing digital audio data, U-Matic machines were already in worldwide use and met digital audio’s fundamental technical requirements, such as bandwidth. Another drawback of the PCM-1630 format is the necessity of having access to a \$40,000 PCM-1630/\( \frac{3}{4} " \) system to hear the master.

The “CD Workstation” idea elegantly resolves many of the problems associated with the U-Matic format. After the entire audio program has been edited on hard disk, the start and end points of tracks are located by marks made directly on the graphical representation of the edited waveform on the computer screen, obviating the need for manually keying in hundreds of numbers. Then, the final edited audio program, complete with subcodes, is written to the “CD Maker,” a Write-Once CD recorder that produces a CD of the program. This master CD, which can be listened to and checked for start- and end-time accuracy and appropriateness, is then sent to the CD manufacturing plant for replication. The mass-produced CDs are identical (in program and PQ points) to the master CD.

The entire PCM-1630 and \( \frac{3}{4} " \) U-Matic tape format, with all its problems, has been eliminated from the CD manufacturing chain. This allows the producer/engineer to play the master disc just like a normal disc, accessing the various tracks and thus knowing exactly how their replicated CDs will sound. In addition, the new master disc is far more robust than \( \frac{3}{4} " \) tape. Finally, some people feel that the \( \frac{3}{4} " \) digital tape generation degrades the music’s sonic integrity, despite the fact that the recovered data are identical.

The key to this new system is the Write-Once technology (called CD-R) developed by Start Lab of Japan. The writable medium is a polycarbonate disc the same size as a conventional replicated CD coated with an organic dye. When writing, the recording laser heats the organic dye, causing it to react chemically with the polycarbonate substrate. This chemical change forms a pit which encodes binary data. A CD-R disc meets all the “Red Book” standards set by Philips for conventional CDs, meaning it is compatible with all CD players.

The “CD Workstation” concept represents a significant improvement over existing CD master-tape preparation methods. The only question now is if CD manufacturing plants will embrace the new technology or try to cling to the workable yet clumsy methods currently used.

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**US: Peter W. Mitchell**

When version III of the Snell C loudspeaker was introduced a couple of years ago, it received mixed reviews. Recently, while working at Canada’s National Research Council on refinements to the forthcoming high-end Model B and the Model 500LCR THX speaker, designer Kevin Voecks found some improvements that could be adapted to the existing Model C. The upgrade turned out to be sufficiently major (a new woofer, revised crossover, and redesigned internal cabinet structure) to justify calling it a new model: the C/IV. Reportedly, while the cost is still in the $2000/pair range, the sound is dramatically improved. I mentioned last month how impressed I was by the sound of the Snell 500LCR; if the C/IV proves to be similarly uncolored and goes an octave deeper in the bass, it will be well worth a listen.

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3 See “The Stereophile Test CD” in Vol.13 No.2 for a description of how this recording was assembled on a Macintosh and hard disk.

4 See the interview with Doug Sax in Vol.12 No.10.

5 I should add that Sonic Solutions’ “CD Workstation” can be used without the “CD Maker” to create a conventional \( \frac{3}{4} " \) master tape, with all the benefits of graphical subcode editing.
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In early April I made a journey to Switzerland to visit Ernst Benz, the manufacturer of the Benz-Micro MC-3 cartridge which so impressed TJN in the March issue, and to get a feel for the Swiss hi-fi and high-end market.

The Swiss market is a very active one, I soon learned. The timing of my visit coincided with High-End 90, the Swiss high-end show, held annually in the Mövenpick hotel in Egerkingen, located at about equal distance from the three major cities in the German-speaking part of Switzerland, Bern, Basel, and Zürich. The first such show was held in 1986, partly inspired by its German counterpart in Frankfurt. It was established to provide a forum for the national and international high-end community, which generally went unnoticed at the big electronics show, Fera, or just plain couldn’t afford or justify a booth there. Initially observed with a mixture of caution and jealousy by the established mass-market forces—importers, manufacturers, press—it is now so well established that this year many of the Japanese electronics giants were represented. While this may undermine the original idea of the show (European shows are public, not trade shows like the CESes), it provides an opportunity for the manufacturer to get in direct contact with his customers, unfiltered by distributors and dealers who may have interests of their own when they relate buyers’ reactions. But mass-market manufacturers attract mass-market customers, the dreaded “brochure collectors.” These are people who are usually not interested in buying something right now, but take the opportunity to gather as much promo material as their plastic bags can hold, so that they can later sit down in the comfort of their own homes to establish which equipment sounds best (by counting the zeros after the decimal point in the distortion specs, of course) and then throw the whole lot away. The desire to get away from this type of customer was one of the original reasons for starting high-end–only shows. (Of course, even high-end customers like to listen to brochures.) But it may have lured in some people who otherwise would never have been exposed to real high-end equipment and sound.

Almost every brand that has any significance in the worldwide high-end arena is represented in Switzerland. I must admit I was a little baffled. Germany is a pretty good country for American high-end wares, yet a German importer will sell probably about the same number of, say, an expensive amplifier as a large dealer in the Los Angeles, San Francisco, or New York area. How can importing into such a relatively small country as Switzerland, even if the Swiss earn good money and appreciate well-reproduced music, be economically viable, given the need for a service department and relatively high costs of advertising per customer? Well, for one thing, importers from the neighbor countries—Italy, France, and Germany—are quite willing to supply a Swiss dealer, even if there is an officially appointed importer in Switzerland. Plus, prices in Switzerland are very high, about on a level with France (where the high end suffers from a 28% sales tax). The Swiss consumer is said to be well-informed and quite sure of his own judgment. Where in Germany a good test in one of the glossies almost guarantees sales, the Swiss are less likely to be influenced by magazines. They are very design-conscious; ugly loudspeakers don’t stand a chance, the Swiss sharing the current Continental predilection for tall, slim columns.

Ernst Benz’s premises are situated in Nehausen, close to the German border and the site of Europe’s largest waterfall. The Rhine river drops about 14 meters here; if you’ve seen Niagara or Iguazu, you wouldn’t be impressed, but I myself was a little awed. Seeing this waterfall alone would have made my trip worthwhile, even had I not also had the pleasure of meeting Benz.

Ernst Benz is an engineer. In the mid-’60s, he was working for a large Swiss manufacturing and engineering concern. In his free time, he tinkered with things hi-fi, mostly cartridges.

6 Switzerland must be the only country in the world with four official languages: German, French, Italian, and Retoroman; a luxury probably only this small a country can afford!

7 At German shows it has become an increasingly common practice to charge a nominal amount for every brochure, proceeds going to charity, to ensure that only the genuinely interested take a brochure.

8 Which means that, for once, a pan-European audio trend started in Germany. Will wonders never cease?

9 Thanks to Luigi Caruso of Empire for help in photographic matters.

Stereophile, December 1990
The Electromagnetic and Acoustic (EMA) Isolation Plate provides both mechanical and magnetic benefits to any audio or video system. The plates are constructed using a low Steinmetz Coefficient material to reduce hysteresis losses and with alternating layers to increase magnetic permeability and minimize eddy current losses. The plate is critically damped and the considerable mass is supported by engineered feet with a damping factor of 0.6.

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Having made the pilgrimage to Idar-Oberstein, in Germany, where Europe's leading diamond maker, Dr. Ernst Weinz, was located, like so many others before and after him he left convinced that the Weinz setup was good but could be improved upon. In 1965, Benz set up shop for himself. He developed two basic patents: a way to give a better polish to diamond tips, and a better way to bond diamond tips to cantilevers. The latter invention proved crucial. Benz had the idea of performing the soldering process in a vacuum. It was quicker and far more reliable than the usual free-air process used by every other maker at the time.

The company has had its ups and downs. Benz expanded very quickly and soon supplied practically everybody who made cartridges in significant volume: Shure, Pickering, Empire, Ortofon, Audio-Technica, ADC, and others. Peak volume was about 9 million needles a year, an awesome number. The workforce was at around the 150 mark.

Benz catered mainly to the inexpensive volume end of the market. In 1981–82, he was approached by the owners of Empire, then an American company based in New York. The owners, reaching retirement age, asked Benz, a major supplier, if he wanted to buy the company. Benz did. This, he says, was the worst mistake of his life. The factory he took over was old and not particularly efficient. Quality was mediocre because the worn-out machines could not be coaxed to work to close tolerances. The workforce, too, was not very dynamic, so introducing new processes and products proved very difficult. Benz had to divide his time equally between New York and Switzerland, spending four weeks at a time in each of his factories. Needless to say, this led to severe morale problems in both places. In the early '80s, consumer interest in hi-fi fell off and the business volume shrank (in '84, CD saved the industry), computer games being the thing customers spent their money on. Finally, Benz's other OEM customers, principally Ortofon and Audio-Technica, were none too pleased that their supplier now wanted to compete with them in the finished-product market, and let their contracts run out without renewal. In the end, Benz had no choice but to close down Empire in the US and trim back his operations in Switzerland. His American adventure turned out to have cost him an awful lot of money. About the only thing that remains is the name, which Benz has kept for his Swiss company: Empire Scientific.

Benz sold his needle production to Ortofon and these days only manufactures MC cartridges. In 1984, he teamed up with Aalt Jouk van den Hul from the Netherlands, whom he supplies OEM with his own designs, for the basic design of a new range of cartridges marketed in the US under the BMS (Benz Micro of Switzerland10) brand. He also supplied Madrigal with the Carnegie cartridges.

To make about 5000 cartridges a year, you don't need a large workforce. It takes practice, dedication, and a light but secure touch to perform these operations; all of the employees concerned with the delicate manufacturing process are female. Everything is done by hand; the coil wire, for example, is so thin that it will snap at a mere 5-Newton tension (less than you are exerting to hold this page); when I held the wire between thumb and index finger, I couldn't even feel it. It must be extremely difficult to glue the needle to the cantilever, then mount the cantilever on the coil armature, and keep them at an exact angle of 90°. All manufacturing operations are performed under microscopes. The breaks are a little longer than in normal factories, but I'm sure they are very well earned. The smallest details make very audible differences with cartridges: the needle, the thickness of the coil wire, whether you take a square plate or a little cross to wind the coils on. . . Some of the reasons why the MC-3 is something special are, for example, that there

10 US distributor: Panther Enterprises, Tel: (818) 989-4434.
The Reviews Are In!

✓ J. Mancuso REFERENCE RECORDING-
“A Bolshoi sock hop performance!”

✓ C. Marchisotto DAHLQUIST-
“The best time ever at CES!”

✓ S. Hill STRAIGHT WIRE-
“It was the highlight of my summer!”

✓ D. Chesky CHESKY RECORDS-
“Best party since the Reagan Inauguration!”

✓ G. Sanders MARTIN-LOGAN-
“Frank Doris will be the next Hendrix!”

✓ B. Low AUDIOQUEST-
“A fantastic ground breaking performance!”

✓ T. Di Chiro KINERGETICS-
“The performance and fun were beyond belief!”

✓ K. Voecks SNELL ACOUSTICS-
“Sensational music and camaraderie!”

✓ S. Marcus SOUND CONNECTIONS-
“A totally unique experience!”

✓ R. Roberts SIMPLY PHYSICS-
“Comrade Tony heads all world fun party!”

✓ S. Winey MAGNEPAN-
“Best sound at CES!”

✓ G. Cardas CARDAS AUDIO-
“It was so cool I couldn’t believe it!”

✓ J. Bicht VERSA DYNAMICS-
“Neatest event in HiFi ever!”

✓ J. Dudley BENZ-MICRO-
“This party was the Hi of HiFi!”

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Winding the coils for a Benz MC cartridge

is a very thin layer of lacquer sprayed on the coils so that they cannot tarnish or vibrate, even microscopically, and that the leadout wires from coils to connecting pins are glued down so that they, too, cannot resonate. I got nervous just watching all this. The thought of ruining an expensive cartridge with one false movement, however small, was a strong disincentive from trying my own hand at MC manufacture.

While he certainly does not have a tin ear, I think Ernst Benz is too down-to-earth to exert himself in the religious intricacies of the confirmed high-end fanatic. As I said, he's an engineer; I guess he gets more satisfaction from doing an excellent production job on his cartridges (every cartridge is individually measured and checked before it is allowed to leave the factory) than from listening to tiny nuances. He's a craftsman in the best possible sense of the word; if he hadn't turned to things hi-fi, I'm sure his skills would have made him just as successful in other areas where precise manufacture is important.

Carlos Lies is the man responsible for the continued sonic development of the Benz range. Recent experiments include a different damper material; while it let the midrange breathe more freely, it also lent a screechy quality to the highs. As always, the secret lies in finding the best compromise. One astonishing demonstration was to hear an MC-3 (in an SME V, with Swiss Physics electronics and several pairs of loudspeakers) with and without outer body. The "naked" cartridge sounded more alive, by a considerable margin, but in a world infested with small children, cats, dust, and cleaning women—speaking for the moment from a purely audiophile point of view!—this is probably not a very practical proposition.

Ernst Benz had a severe traffic accident in 1988 when a negligent driver almost killed him. He took a long time to recover, which is why the company has not been in the limelight for a while. (Not that this experience slowed him down all that much; he had another near-brush with death recently while enjoying his hobby, flying his sailplane.) He came back to work on a Revox turntable, a design which offers CD-like convenience, but suffers from terminal structural instability in several key parts, notably the tonearm. Benz builds in several redesigned parts, literally transforming the original design, then installs one of his MCs. The resultant player is called the Empire MC-Reference and apparently sells quite well to audiophiles who either don't want the hassle of the usual audiophile turntables, or whose families want to play music on the big system but can't be trusted with expensive MCs in normal 'tables: the Reference features wholly automatic operation. The sound quality is broadly comparable with a good CD player, so if you have a large collection of analog LPs, yet have grown used to the creature comforts a CD player routinely offers, this might be the answer.

There is a finished design for a preamplifier, but Benz is as yet undecided on whether to put it into production. He may team up with Swiss Physics' Mauro del Nobile for a power amp and then offer a complete range of electronics. (Benz tried to distribute Spectral, which he rates very highly sonically, in Switzerland, but pulled out when Spectral, anxious to protect its technology, refused to supply circuit schematics for service purposes.) Apart from these hi-fi-related activities, Benz builds vacuum ovens, an area where he has some considerable exper-
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tise going back to his early patents for diamond tipping.

**US: Peter W. Mitchell**

In last July’s “Update” I commented on JGH’s April 1990 article on room acoustics (“Searching for the Hi-Fi House”). Since I had obtained satisfactory deep-bass response in the L-shaped living rooms in my previous apartment and in my new house, I suggested that L-shaped rooms are not as “classically horrible” as JGH had claimed.

Further experience in my new living room suggests that my optimism was premature. JGH, as usual, was correct. (I should have known better than to doubt the old master.) Not that you can’t get good bass in an L-shaped room, but it is more difficult—and certainly is less predictable, which was Gordon’s central point.

In my previous apartment I had the advantage that four of the room’s six boundary surfaces were solid concrete (the floor, the left wall, the wall behind the speakers, and half of the right wall). In my new listening room I have only two and a half rigid boundary surfaces (the floor, the right wall, and part of the wall behind me). The ceiling is high and vaulted, minimizing the effect of vertical standing waves, which is good. But the ceiling and the wall behind the speakers are wood-frame structures, and a large part of the wall behind me is a glass patio door; the flexure of these boundaries allows some of the bass energy to escape from the room.

When I moved into this house I was using a bi-amplified sub/sat system—a pair of minimonitor satellite speakers mounted on stands well away from the walls, plus a subwoofer driven by its own amplifier and residing near the wall behind the satellites. Since an electronic crossover handled the transition to the satellites and the woofer had its own level control, both the amount of deep-bass response and the shape of the midbass transition were completely adjustable. Of course the system didn’t sound identical in my old and new homes; I wouldn’t expect it to. But its adjustability made it very easy for me to get good sound in this new environment—so easy that I was fooled into regarding the room as innocuous.

Recently, when I began to test some full-range speakers (with the woofer and mid-range/tweeter housed in the same cabinet), speaker/room interactions become a problem. The difficulty became very obvious when I installed ATC SCM100A studio monitor speakers. I put them where my satellites had been, because I knew they would provide excellent imaging there. According to the maker’s curves and my own nearfield measurements, the on-axis response of each speaker is quite flat. But when I moved my measuring microphone back to the neighborhood of my chair, I encountered a peak around 150Hz and a lack of low bass.

I was able to move the midbass peak down in frequency and reduce its severity by raising the woofers higher above the floor (a struggle—each speaker weighs well over 100 pounds). But the bottom-octave droop remained. Playing one channel at a time and roaming around, listening and measuring with a spectrum analyzer, I found that the low-end droop is caused by the L-shaped room, which has a left-hand wall only in its front half. In the rear half of the room, to the left of my chair, there is no wall—just a large opening into a dining area. At low frequencies the effective “width” of the room is not the 17’ distance from the solid right wall to the half-wall beside the left-channel speaker. Instead the effective width includes the dining area, for a total span of 25’.

The left-channel speaker, located about 4’ in from the adjacent half-wall, was midway in this 25’ span, which placed it in the null of the room’s lowest-frequency standing wave. (In any room, the fundamental standing wave on each axis produces sound-pressure maxima at the boundaries and a pressure minimum at the midpoint.) Consequently, in the bottom octave the left-channel woofer was working into a virtual vacuum.

Normally, when the two speakers of a stereo pair operate in-phase, the second woofer boosts low-bass levels by 6dB. But in this room, as initially placed, the woofers reinforced each other only in the midbass; in the bottom octave the right-channel woofer operated alone. I will continue experimenting to
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Lewis Lipnick
Stereophile Vol. 13, No. 7, July 1990

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Hi Fi News & Record Review, Nov. 1989

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find the best locations for speakers and listener in this L-shaped room. I'll also try to correlate my findings with the predictions of The Listening Room, a new $30 program for IBM-compatible PCs that instantly calculates the peaks and valleys produced by standing waves and boundary reflections for any speaker location.

US: Thomas J. Norton

We don't normally have a section on "new product announcements" for a number of reasons. But occasionally a product press release shows up in our mailbox which is rare or specialized enough to be worthy of discussion. For serious collectors of 78rpm recordings (remember those?), or even the few die-hards who insist that things have gone nowhere but downhill since the fast-speed format was abandoned in favor of those inferior LPs (remember those?), the pickings are slim in turntables designed to play 78s—especially at reasonable prices. A company called Esoteric Sound (4813 Wallbank Avenue, Downers Grove, IL 60515) has marketed such a turntable in the past, and now has an updated version. The new model has four speeds for vintage discs (standard 78rpm plus three variations—not all older recordings were recorded at precisely 78), plus standard 33.33 and 45rpm. With its direct-drive motor, platter-edge strobe markings, and familiar-looking detachable headshell arm, it strongly resembles certain Technics turntables of recent yore. And at $375, you can pay for it out of your piggy-bank. Options include (inexpensive) Stanton or Shure cartridges with LP and 78rpm styli.

At a somewhat higher price level, Jim Griffin of Artech, the Canadian distributor of SME (Sumiko are the US distributor) informs us that the new SME Model 30 turntable, shown in prototype form at the 1990 SCES, features a 78rpm speed with a particularly wide range adjustable by means of a 20-turn potentiometer. The price, however, will be $25,000!

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It's not unusual for *Stereophile* to report that the choice of amplifier makes an audible difference. The most obvious contrast between high-end journals and mass-market magazines is that high-end reviewers devote a lot of attention to the sonic qualities of preamps and power amps. At *Stereo Review*, differences among electronics are regarded both as 1) predictable from conventional measurements, and 2) relatively unimportant since they are much smaller than the differences among loudspeakers.

I have held that view myself, at least in the context of budget-class equipment. It seemed reasonable to judge high-end amplifiers more critically, for two reasons: 1) People spending thousands of dollars for an amplifier can afford to be picky about even subtle differences, and 2) exotic high-end speakers often have weird impedances that place exceptional demands on the amplifier. Inexpensive speakers seldom have impedances lower than 4 ohms at any frequency.

But loudspeakers have been improving at a rapid rate, thanks both to better drivers and to discoveries made at Canada's National Research Council about relationships between measurements and sound quality. Many budget-priced speakers today possess qualities of neutrality and transparency that were rare in multi-kilobuck models a decade ago. The entry-level cost of high-end sound has declined, and with it the price level at which sonic differences among amplifiers begin to matter. I'm not talking only about power reserves to drive low impedances, which used to be the main difference between good amplifiers and mass-market junk. Subtler factors are also becoming significant with today's better budget speakers.

Here's an example. Recently I had an opportunity to compare a pair of NAD 2100 amplifiers operating as bridged monoblocks ($800 total, 150Wpc) with a Nakamichi PA-5A II ($1550, also 150Wpc). I connected them alternately to

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**NAD 2100 power amplifier**

**Nakamichi PA-5 A II power amplifier**

*Stereophile*, December 1990

75
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Since I write literature for both NAD and PSB, it would be improper for me to recommend their products here; but they do have an excellent reputation, and having them in the house provided the basis for an instructive comparison. As their ratings suggested, the Nak and the bridged NADs proved equally powerful: each drove the PSBs to short-term peak levels of 112–113dB before clipping distortion became noticeable. Their other specifications were substantially similar. Yet, driving $500 speakers of conventional design, they sounded obviously different. Neither was defective or operating improperly; each amplifier/speaker combination produced good sound, but they weren't the same.

The most immediately obvious difference was that the Nak sounded a bit smoother in the highs. The bridged 2100s were noticeably brighter, tending to emphasize the slight steeliness of CD string sound. (GL and JA noted similar brightness last December and January in their reviews of a single 2100 operating in stereo.) The positive side of that coin is that the bridged 2100s produced a more open and detailed sound; for instance, when violins and violas were playing together it was easy to follow them separately, while the sound of the Nak was more fully blended.

With respect to soundstage imaging, the comparison vindicated my preference in May's "Update" for monoblock over stereo amplifiers. With no interaction between channels, the bridged 2100s produced a consistently wide, deep image with plenty of ambience. The Nak had no lack of stereo separation, but its soundfield seemed a tad closed-in by comparison.

At low frequencies the Nak won hands-down. With the 2100s the bass was a bit thick and boomy, with an obvious emphasis at the woofer's resonant frequency. With the Nak the bass seemed to extend an octave deeper, taut and well-defined, with no audible resonance; when organ pedals accompanied the bass fiddles in an orchestral passage, their timbres were separately identifiable. At low frequencies there's no substitute for a vast reserve of current, which is mainly a function of the size, weight, and cost of the power supply. The big Nak, which weighs and costs more than both 2100s combined, had a natural advantage here.

Dynamic headroom improvers, such as NAD's Power Envelope, Proton's DPD, and the commutator in Carver's "magnetic field" power supply, provide higher power-supply voltages and thereby enable the amp to deliver more short-term power at middle and high frequencies without clipping, while keeping the cost low. But the impression of low-frequency extension and control depends mainly on output current capacity; ie, on the size of the power transformer and filter capacitors.

The only drawback of a comparison like this is that after hearing the limitations of both amps, it was hard to be satisfied with either. What I want now is an amp that combines the virtues of both—the deep, textured bass and smooth highs of the Nak together with the superior detail and spaciousness of the bridged NADs. One day perhaps I'll get a chance to compare some more candidate amplifiers, including the new version of the Nak (the PA-5A III), a bigger NAD (the 2400), the new version of the Adcom 555, the B&K M-200, et al. You should, too, if you're putting together a system in the $4000 price range.
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Tweaks have acquired a bad reputation in certain sectors of the audio world, probably with some justification. Warming the cartridge to exactly the right temperature, suspending cables from the ceiling (but not with cotton string; it sounds grainy and dry), stroking CD cases with a "magic" brush, drinking "polarized" (or is it de-polarized?) water before a listening session—gimme a break!

And yet, it seems undeniable to me that paying attention to apparently minor aspects of system setup and the use of various low-cost accessories can produce major improvements in the sound of an audio system.
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Sure, anyone with sufficient cash (or credit) can spend, say, $10,000 on a system selected from “Recommended Components,” hook it all up, and, assuming that the particular components selected don’t bring out the worst in each other, the sound will probably be pretty good. However, even a compatible assortment of components will not sound its best without some, well, tweaks. In fact, I would argue that a tweaked system at a given price level will sonically outperform a system consisting of nominally better (and more expensive) components that have not been subjected to tweaking.

Through the years, a variety of tweaks have been touted to produce “fantastic” improvements. Many of these turned out to be examples of wishful thinking; some have done more harm than good; others involve a degree of obsessiveness about sound that tends to interfere with the enjoyment of music. The tweaks described in this article (RL’s suggested subtitle was “Tweaks for the Timid,” but that’s not quite correct. Cautious, perhaps; timid, no.) are based on my own experience, though they’re mostly derived from suggestions made by others. They were selected according to the following criteria:

1) As far as I know, they do no harm. Nevertheless, remembering L’Affaire d’Armor All, I must issue the standard disclaimer: I’m not responsible for direct or consequent damage to equipment or persons. However, if use of these tweaks results in your being branded an audio wacko, feel free to blame me.

2) They work. That is, I have satisfied myself that they allow my system to make sounds that are more like real music. Not every one of these tweaks produces a “fantastic” improvement, and in some systems, I’m sure, the effect of a given tweak will be undetectable. I do think they all have the potential to make an audible difference for the better.

3) The cost, in most cases, is negligible.
4) They’re convenient to implement.
5) One does not have to believe in mysterious forces or hitherto-undiscovered forms of energy in order to understand the reasons for their effectiveness.

**Turntable, arm, cartridge**

The importance of turntable/arm/cartridge setup is so well known that it hardly needs to be considered a tweak. I have a Linn LP12, notorious for its finickiness, and leave the adjustment of suspension springs, etc. to people who are very experienced with this product (Sean Burt of Stereo Factory, you know who you are), doing only some final adjustment of the VTA/SRA myself after the initial setup. I increase the VTA by gradually raising the pivot end of the tonearm until the sound becomes overbright, then back up and down just a bit. It’s true that records are not all cut at the same VTA, so that, for optimal playback, one should adjust the VTA for each record, but I think the “listening for sound” attitude that this sort of tweaking engenders is fundamentally anti-musical (not to say obsessive-compulsive), so I prefer setting the VTA to be appropriate for most records, and leave it at that. Of course, stylus suspensions do change during the break-in period, so some tweaking of the VTA is needed after about 20–30 hours of playing; but after that, only if you start to feel that the sound of the cartridge has deteriorated. (There may be some hardening of the stylus suspension with age.)

Stylus cleaning is usually considered normal practice; I variously use a stiff brush (back-to-front only, of course), Audio-Technica vibrating cleaner, the extra-fine emery paper Linn provides for stylus cleaning, and Stylast.

**Sumiko Fluxbuster:** This product has been reviewed several times in Stereophile and is listed in “Recommended Components.” Although a bit on the expensive side (I have no experience with the $80 unit from AudioQuest that claims to do the same thing), it really can rejuvenate a moving-coil cartridge that appears to be over the hill, so it can quickly pay for itself. I use mine at least once a month.

**Turntable stands:** The British have been at the forefront here; only lately have US companies (eg, Arcici, Merrill) begun to realize the importance of the structure on which the turntable sits (sorry, stands). The exact effect depends on the particular turntable and the construction.
of one's abode, so try to borrow a stand from a friendly dealer. I use a Sound Organisation sub-base resting on an equipment rack, having refused to consider one of their little tables that would force me to get down on my knees (at the Altar of Analog?) to put on a record. It works quite well to clean up the Linn's midbass looseness. More compliant supports, such as Navcom Silencers (see below), provide an alternative to controlling the turntable's intrinsic resonances; they seem to work well with turntables whose own suspensions are low in compliance (eg, VPI Jr.).

CD player

Retrieval of information from digital storage seems inherently less subject to tweaking than the retrieval of analog information (who ever heard of tweaking a computer's hard drive?). So for some time it was assumed that, in the absence of circuit changes in the digital and/or analog sections, the sound of a CD player is what it is. If you don't like it, get a better player. (Or, many would say, play an LP?) Fortunately for those who love music and whose funds are not limitless, it is possible to improve CD playback without buying one of the multi-kilobuck machines: a tweak here, a tweak there...

**Shorted digital output:** Philips/Magnavox players, and reportedly others as well, sound better with the digital output shorted. Just insert a shorted RCA plug (you can buy one at Radio Shack or make one by soldering a wire between the positive and ground terminals) into the "Digital Out" jack.

**CD damper rings:** These have been tested/discussed at some length in *Stereophile* and elsewhere. No, they don't seem to affect the error rate or jitter. The effect may very well be a secondary one, perhaps acting through power supplies. If you have a high-end CD transport, you probably don't have to bother with damper rings; in fact, they're incompatible with the full-disc clamping method used by transports like the Teac Esoteric P2 and P10. However, with lesser transports, like my Philips CD650, before/after comparisons I've done in every case favored the ringed disc. Centering the Monster rings is a royal pain, and they should be well-centered if unbalancing is to be avoided. The new Sims Reference Bands, distributed by Sumiko, which fit around rather than atop the disc, obviate the need for centering, are compatible with a broader range of players, and the sonic benefits appear to be superior to those of the Monster rings.

**CD Stoplight:** Yes, this is the green paint, and yes, it does work, and better than ordinary green marker. Some claim that if you use the Sims Reference Bands it's not necessary to apply CD Stoplight to the edge of the disc. Maybe so (I haven't done careful comparisons), but the CD Stoplight treatment is cheap and easy enough that I do it anyway.

**Internal tweaks:** For these, you have to open up the machine, having disconnected it from AC and affixed the transport lock screws. As manufacturers frown on "unauthorized personnel" tampering with their products, internal tweaks have to be done after the warranty has expired or you must adopt a devil-may-care attitude if anything goes wrong while you're tinkering inside. Still, there are a couple of internal tweaks that are easy to do and pretty safe. First, if the player has a headphone output that you don't use and if the headphone amp is on a separate board connected with a plug-in type of wiring harness, disconnect it. Just a little more ambitious is the application of damping materials inside the chassis. This is a trick used by some specialty manufacturers in their modifications of Philips CD players. The rule here is to put the damping material wherever you see exposed vibration-prone parts of the chassis. Just be careful that you don't interfere with the operation of the transport. (A&S Vibration, Inc. markets a "Tweak Pack" of Navcom sheets that's probably best for this purpose.)

**Put damping material wherever you see exposed vibration-prone parts of the chassis.**

**Digital Interconnect**

For those with an outboard digital converter, the link between CD player/deck and converter has to be considered. The jury is still out on fiber-optic links, so the safe solution is to use a conventional interconnect. Since the wire has to carry only the digital on/off pulses, any cheap interconnect will do, right?

Would that it were so! This connection is absolutely critical, and different cables sound as least as different as they do in a pure analog application. (Please, no cracks about how this
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could be taken to mean that there are no differences here either.) Comparing a variety of audio and video cables as digital interconnects between my Philips CD650 and Aragon D2A, I have found Music and Sound’s mastER LINK LP (Gray) to be superior by a surprising margin. The digits come out sounding more like music! (It’s also a very fine analog interconnect.)

Preamplifier
I’ve found two important preamp-specific tweaks: shorting of unused inputs (do not short the outputs!) and disconnecting tape outputs when not making a recording. Shorting of inputs (with shorted RCA plugs) can bring about a noticeable widening and deepening of the soundstage; my guess is that much of the advantage of the direct connection of CD player to amp derives from the lack of interference from “dangling” inputs. At the output side, it appears that tape-deck recording electronics present an uncomfortable load to the preamp if not energized, so if you’re not using the deck for recording, you should turn it on anyway, or, as suggested, pull out the plugs from the “tape out” jacks. I first discovered this effect when I noticed a deterioration in my new preamp’s performance after connecting a tape deck. The proviso is that the effectiveness of both of these tweaks depends on the design and construction quality of the particular component. With really good isolation of inputs and buffering of outputs, the effect may be minimal, but it’s certainly worth checking out.

Power amplifier
No specific suggestions here, but several of the points mentioned under “System Tweaks” are applicable.

Speakers
Just the usual things: keep them away from walls and corners (unless they’re specifically designed for such placement); use sturdy spiked stands or Tiptoes if appropriate; experiment with varying the vertical and horizontal angles; use the best cables you can afford; use spade lugs rather than banana plugs; if you have to use bananas, use ones with a high-pressure spreading action (eg, WBT). Almost every speaker I’ve heard sounds better with the grille cloth removed; depending on the manner in which the grille is attached and depending on how acceptable you find the appearance of
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**Removal of the grille is probably the most universally applicable speaker tweak.**

**System tweaks**

**AC plug orientation:** This is quite a well-known tweak, and, with some components (not all), the effect is quite substantial. The procedure is to disconnect the component (CD player, preamp, etc.) from the rest of the system, turn it on, measure the residual voltage appearing on the chassis (use any voltmeter, connect the black probe to a known ground, and touch the red probe to a metal part of the chassis), pull out the AC plug and plug it in the opposite way, measure the chassis voltage again, and leave the plug in the orientation that resulted in a lower chassis voltage, marking the orientation for future reference. The most noticeable effect of going through this procedure for every component in the system is improved midbass clarity (reduced intermodulation with hum, I guess). Clark Johnsen, author of *The Wood Effect* (see below), suggests listening to the system with all the AC plugs oriented for minimum chassis voltage, reversing all the plugs and listening again, then using the orientation that sounds better. Although I don't understand why the reversed orientation should sound better, it would be at least instructive to listen to the contrast. (In my system, the “correct” orientation does sound better.)

**AC line cords, speaker cables, interconnects:** I won't get into the issue of the role of cables in determining sound beyond saying that, indeed, they can play an important role, but I want to say something about the positioning of these cables. This is another area that one can easily get paranoid/compulsive about, but I think it's reasonable to keep AC cords away from interconnects and speaker cables whenever possible, also interconnects and speaker cables from each other, crossing them at right angles if necessary. Finally, although much too expensive to be considered a tweak, the Tice Power Block is a great product that really does work as claimed, bringing about a significant cleaning up of AC power, with major gains in sound quality.

**Absolute polarity:** Clark Johnsen's *The Wood Effect* reviews evidence and opinion on the importance of this variable. Absolute polarity (sometimes called absolute phase) is best thought of as a system characteristic, and refers to whether a sound that originally started out as compression followed by rarefaction (i.e., positive then negative) is reproduced that way rather than as rarefaction followed by compression (i.e., negative then positive). Given components either maintain or reverse absolute polarity, with the result that the system as a whole may be in correct polarity for one source (eg, CD player) but not for another (eg, phono). Recordings themselves may be recorded in or out of absolute polarity, and, to make things even more complicated, polarity may not be the same for the whole recording, or may vary for different instruments in a multi-track mix.

The audibility of absolute polarity differences under laboratory conditions with test signals has been demonstrated by Stanley Lipshitz and others, but there is some controversy about how important (as opposed to statistically significant) the effect is under normal listening conditions with less than perfect recordings, and about how sensitive different people are to reversal of polarity. As far as I'm concerned, although I can hear the difference with some recordings (the Chesky Test CD provides a good demonstration), I'm not driven to a fit of frenzy whenever a reversed-polarity recording assaults my ears. I certainly would not want to switch speaker cables (Johnsen suggests this is more effective than electronic signal reversal) whenever I suspect the recording to be of the wrong polarity.

So, why include maintenance of absolute polarity as a recommended tweak? Well, it costs nothing, and, other things being equal, it's better to have the system in rather than out of absolute polarity. (Of course, this does not guarantee that all recordings will therefore be polarity-correct...). The Chesky Test CD is ideal for determining which connection maintains absolute polarity; you then have to check if an LP known to have been recorded in correct polarity sounds better with the connec-

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1 Available from The Audio Advisor (see ad in this issue) or direct from the publisher, The Modern Audio Association, 23 Stillings Street, Boston, MA 02210, Tel: (617) 357-8040, for $7.95 plus $1.05 shipping and handling.
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THE AUDIO GLOSSARY by J. GORDON HOLT

In the three and a half decades since the arrival of stereo, no one has done more than J. Gordon Holt to develop and define a consistent vocabulary for describing reproduced sound. This is actually two dictionaries in one: a glossary of subjective audio and a comprehensive plain-English guide to nearly two thousand technical terms. If you aren’t exactly sure about “liquid” midrange or “hard” sound, or find yourself puzzled by an unfamiliar word or alphabet-soup abbreviation, you’ll find a concise explanation in this handy, compact reference volume.

But watch out! When you least expect it, Holt’s dry humor emerges. You’ll learn that a cassette is “a small cass,” a chube is “a British tube,” and a code causes “blockage of the dose.” Whether you chuckle or groan, you won’t be bored!

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tions as set for CD or in reversed configuration. If the reversed sounds better for LP, the cartridge connections should be reversed. Some preamps have an absolute-polarity reversal switch; owners of these preamps can play with this parameter to their hearts' content. My Aragon D2A digital converter has remote-controlled polarity reversal; although it's useful for making some critical comparisons, I find it leads me to listen for sound rather than to the music (the audiophile's Achilles' heel).

**Cleaning contacts**: It's no coincidence that the word “clean” is often used to describe well-reproduced sound. Cramolin is the stuff to use; just follow the instructions, making sure you wipe it off until the cloth (or Q-tip) is not picking up any more dirt. I've also used Tweek (sold as Stabilant 22A in Canada), which is not a cleaner but a "contact enhancer," but I'm not so keen on it now. It's true that application of a small amount of this liquid to an electrical contact enhances the effectiveness of the contact, but, as the Stabilant 22A instructions warn, it should not be used if the metals are dissimilar.

**Tweek should not be used if the metals are dissimilar.**

The caveat is very important; if you use Tweek between, say, a gold-plated RCA plug and an aluminum-alloy jack, the contact will be improved initially, but over time (weeks) the metals will react chemically with each other and the sound will show increased degradation. If you then clean the contacts, you'll find a black gunk that looks just as awful as the system has started to sound. I've even had a problem with Tweek when both plug and jack were supposedly gold-plated; on one of them, the plating was apparently very thin and impure. So, if you use Tweek (it's tempting; the sonic improvement can be quite dramatic), make sure that both surfaces have high-quality gold plating, and check the cleanliness of the contact in a few weeks. If you see evidence of the black plague, fret not: Cramolin will remove it and the Tweek.²

**Navcom Silencers**: For vibration control, these are the ticket. The Silencers, developed by Sims and now marketed by Sumiko, are puck-like devices that do a better job of isolating components than anything else I've tried. They have a salutary effect under CD players (although not, I expect, ones where extensive vibration control is part of the design), preamps, and power amps; they're an alternative to Tiptoes under speakers (you have to try them; a friendly dealer is your ally here, too); and some have reported major improvements with turntables.

**Tube dampers**: Obviously, solid-state equipment is unlikely to benefit from use of these devices; as far as I know, there are no "transistor dampers" on the market, although some audio manufacturers take special steps to reduce the effects of vibration in solid-state circuits. But tube preamps, power amps, CD players, etc. do benefit. The effect is apparently related to tube microphony; transients, in particular, seem crisper. I've had good experience with Audio-Quest's Sorbothane dampers; Sims is about to release their version, made of Navcom, of course. Be sure that you don't put dampers on tubes that get quite hot—eg, amplifier output tubes—it can get extremely messy.

**Tweakitis**

As with many human activities, tweaking in moderation is both pleasant and useful, but an excessive urge to tweak may be regarded as a disorder—nay, an illness. Here are some of the symptoms to watch for:

1) A manufacturer unveils a $17,500 CD transport (to serve as the basis for a $500 unit with the same transfer function). Your immediate thought is, "I wonder if it would sound better with Navcom Silencers under it."

2) You cannot attend any symphonic concert without wondering if the sound is out of absolute polarity.

3) You write an indignant letter to TAS about what a conservative fuddy-duddy Enid Lumley has become.

4) You carry a full set of hex wrenches with you, in case you run across a tonearm whose VTA is not quite right.

If these symptoms persist, just keep saying to yourself, over and over, "It's only hi-fi... it's only hi-fi... it's only hi-fi..."

Speaking of hi-fi, I'd better check my CD player. I think the laser's wavelength needs a tweak.

²I'm intrigued by KK's enthusiastic report (Vol. 13 No. 8) on a new cleaning fluid called Kontakt. Apparently, it's not yet available in North America, but it can be obtained from the Hi-Fi News & Record Review Accessories Club, Tel: (011-44) 234-741152 for credit-card orders.

Stereophile, December 1990 91

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Santa Fe's largest record store has finally pulled the plug on LPs. In a recent newsletter, Rare Bear proclaimed that all their remaining vinyl record stock would have disappeared from the racks "forever" by the end of April. As I write, a storewide sale on new and used LPs is in progress to expedite this liquidation. Needless to say, my record-collecting friends and I are making frequent trips to this shop. While browsing the LP bins, I look up occasionally and see customers throughout the store digging deep into the vinyl looking for LP treasures which they, most likely, will never have the opportunity to buy again. And they are buying them! Contrary to popular opinion, there are folks out there who still own record players and buy records. Now that CDs have effectively eliminated an alternate storage medium for our musical entertainment, will these consumers convert or stop consuming? I don't know, but I can't help but ask myself if this situation is symptomatic of record stores in other parts of the country. I was eager to find out, so when my then girlfriend asked me to accompany her in the spring to Boston for her daughter's senior recital at the New England Conservatory, I jumped at the opportunity. I would not only have a chance to visit the city for the first time, but I could survey the record-store scene there and report on the availability of LPs.

It's a short walk from the Massachusetts Avenue "T" station to the center of Boston's music nerve center—Symphony Hall, the New England Conservatory, and the Berklee School of Music are within a few blocks of one another.
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Reference.
Pedestrian traffic is mostly students going to or returning from rehearsals or performances, or concertgoers queuing up for tickets to the Boston Symphony or other events. The atmosphere in this part of Boston is permeated with activities related to musical matters. It's only natural, then, that one would expect to find record stores nearby. In fact, one entrepreneur had set out several hundred LPs leaning up against the wall at the corner of Symphony Hall. I had to stop to take a look. Mostly '60s and '70s rock and pop at a buck each. The condition of the records was typical "frat-house," so I continued on my way, empty-handed, toward Boylston Street and Looney Tunes.

Looney Tunes has two locations in the Boston area: at 1106 Boylston and at 1001 Mass. Ave. (as the locals say) in Cambridge. From what I saw during my brief visit to Boston, I consider Looney Tunes Boston's premier used-record shop. It's a vinyl junkie's paradise. The Boylston store will win no awards for interior decoration, but will cause the record collector/music lover serious anxiety attacks as he or she enters the store. LPs are everywhere—behind the counter, lining the walls, in crates on the floor, in browser-bins, under browser-bins, even in milkcrates outside! The store smells like used records. My kind of place! Stereophile is sold here (always a good sign), as well as the VPI record-cleaning machine.

It's obvious that these folks take their business seriously. While I shopped, a steady stream of customers went in and out the door, those leaving usually with bags full of records carried protectively in their arms. Entire collections are dumped here, and the selections in the bins change daily (even hourly). All categories of recorded music are found, with an especially large selection of classical, opera, and jazz. In the vintage audiophile section are found those RCAs and Mercurys, as well as a good sampling of Reference Recordings, Sheffields, Wilsons, and what few Proprius LPs are still available. You won't find any bargains here, though, because these guys know the market; those RCA shaded dogs and Living Presence Mercurys will send you to the bank for a loan. I passed on the collector's items, but managed to find a Michel Chapuis Astrée recording, an organ recital on Titanic Records, and a linen-boxed set of the Bach Brandenburgs performed by Concentus Musica Wien under Nikolaus Harnoncourt on Telefunken's Das Alte Werk label. The records were in mint condition and the prices were right—$3.99 per disc. In a corner at the rear of the store are found CDs and cassettes. I didn't spend much time there, though, for the CDs were under lock and key, making browsing difficult. Stored vertically, it's hard to see the titles of the CDs because of the small print; you can develop an unnatural bearing as you crook your neck to read them. How much nicer to let your fingers do the walking through the LP browser bins! I made a note to return here before I left town.

At the corner of Mass. Ave. and Newbury St. stands the multistoried shrine to home entertainment known as Tower Records/Video. This place is a department store devoted to consumer consumption. After checking your bags, you can proceed either to the video department (ground level) or, via escalator, to popular music (second floor) or classical and jazz (third floor). Big business is done here, with the place jammed with customers until closing time at midnight (the yellow Tower Records shopping bags were visible all over this part of the city). If you come here expecting to find a lot of vinyl, though, you'll be disappointed. CDs have taken over, with what little vinyl to be found consigned to just a few racks. A large selection of not-so-exciting classical cut-outs remains on the third floor, but it's really a rather dismal scene here for LPs. Jazz collectors building their CD collections, though, will feel a rush of adrenalin as they exit the escalator on the third floor. Facing you as you get off is a large display of Fantasy's Original Jazz Classics for $9.99. Bill Evans, Monk, Sonny Rollins, Miles, etc. are to be found in quantities which made this small-town boy dizzy. Inside the jazz department, the walls are lined with boxed CD sets of some of the legends of jazz for very attractive prices. For example, at the cash register was the new 10-CD PolyGram set of the complete Emarcy recordings of Clifford Brown for only $119.95. Strong willpower prevented me from turning over my MasterCard—I came to Boston to find and buy vinyl!

The next day I found me once again browsing the bins at Looney Tunes. As I made a pur-
Looney Tunes (Boylston)—vinyl heaven, and they sell *Stereophile*, too

Just a part of the blues section at Cheapo, with early jazz underneath
chase, a fellow wheeled in three crates full of LPs which were quickly scanned and examined by the staff. In a matter of minutes, they were put out on the racks. Yeah! I felt an urge to camp out here for a day or so, but also felt compelled to see what else this city could provide to feed my ravenous appetite for vinyl. A return trip to Tower proved frustrating. I was looking for the newly reissued János Starker recording of the Kodály Sonata For Unaccompanied Cello, Op.8, but was informed it was not yet available. Drat. I also looked for the Bagdad Cafe soundtrack. The card showed a history of sales, but the record was not found. The clerk suggested I order the CD, for he felt the LP was now unavailable. That wasn’t what I wanted to hear, but confirmed rumors I’d heard regarding the future of LPs; namely, that there were none. Depressed, I left Tower to stroll down Newbury to Newbury Comix, a place where, I’d been told, I could find any underground import LP as well as obscure 12” singles.

I did, but left empty-handed. Just not my cup of tea. I crossed the street to the Avenue Victor Hugo Bookstore (used books, used records, the same compulsion draws me into these shops) and found a first edition of Charles Mingus’s Beneath the Underdog. I snapped it up and returned to the street in search of lunch and Audio Ideas (a local high-end store). I found Audio Ideas, spent a few moments there admiring the sound room, then continued on my way to Pizza Uno, where I had the best pizza I’ve ever tasted. If you’re ever in Boston and you love pizza, you must try it. You won’t be disappointed.

I retraced my steps to Tower Records (funny how everything seems to begin and end at Tower) to catch a bus headed for Harvard Square. I got off, after a short ride, directly in front of Cheapo Records. I didn’t have much time for browsing, for they were getting ready to close, but the first impression was a knockout! Here were all those nonclassical LPs I’d been looking for, records I’d often drooled over in catalogs—and reasonably priced. Scottish, Irish, Cajun, Zydeco, rhythm & blues, rock & roll, jazz, country & western, old-timey, etc., etc. A veritable motherlode of music forgotten by many but revered and treasured by all who recognize the importance of popular and/or folk music. Here was, musically speaking, the fertile soil from which springs the music of today. I promised myself to return the next day.

Cheapo Records is a veritable motherlode of music forgotten by many but revered and treasured by all who recognize the importance of popular and/or folk music.

What is a trip to Boston without a visit to Cambridge and Harvard? I started at the Coop in Harvard Square and worked my way back down Mass. Ave. to Boston. Thinking I might need a good bag to put my record purchases in, I bought a Coop shopping bag. That was the only thing I bought there, though, because LPs were nonexistent in the Coop. CDs had taken over with a vengeance, and the place was jammed with customers, making even CD browsing difficult. I soon got claustrophobic and had to leave. For the vinyl junkie, the Harvard Coop is a waste of time.

For the vinyl junkie, the Harvard Coop is a waste of time.

A few blocks down Mass. Ave. from the Square is Briggs & Briggs, Inc., a smallish shop with LPs and CDs occupying about half the floor space. This was the only store where I found new classical LP releases, confined to a small rack at the rear of the record department. I browsed briefly but found nothing of interest. A decent selection of new blues, folk, and ethnic music LPs was available here, with prices I judged to be about average for this town. Briggs & Briggs needs help, though, in their selection of jazz recordings. Many independent labels were represented, however, especially those based in Boston. Not really worth a return trip, in my estimation.

A short walk from Briggs & Briggs is Mystery

1 A shame indeed, for when I first started to visit the US on a regular basis in the early ’80s, Boston and the LP selection offered by the Harvard Coop became a habitual stop on my way back to Europe. These days, it has gone the way of that other great US record store, Chicago’s Rose Records, CD superstores both.

Stereophile, December 1990
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Train. Yeah! I could tell from the dusty interior and musty smell that this would be more to my liking. Little more than a hole in the wall, the shop was crammed with used LPs. The dim light made browsing difficult, but I managed to find a shaded dog, LSC 2323, filed in the “International” (!?) section. Much to my delight, I also located an original Blue Note pressing, Cannonball Adderley’s Something Else (BN 1595), which I owned only in a reprocessed “stereo” version. This recording is a must for any collection, representing the pinnacle of jazz ensemble performance.

At Mystery Train you have to get down on your hands and knees to be successful in your search. It’s worth it! The fellow who took my money is also a writer (of poetry); I bought a collection of his poems to help him out. Lots of rock & roll and jazz here—Muddy Waters was playing through the store’s unidentifiable loudspeakers. This shop will quicken the pulse of any record collector! On my way to the second Looney Tunes store, I stopped on the sidewalk to peruse a record collection housed in cardboard boxes offered for sale by a pleasant young fellow. Several people had gathered and were buying ’60s rock at a buck apiece. Not for me, though, and I continued on my way to bigger and better things.

The Cambridge Looney Tunes is a real haven for the record collector. Well-lit and spacious, it made record shopping a pleasure. These guys know their records, though, so look elsewhere for bargains. A large section of the classical LPs was devoted to “collector” records: shaded dog RCAs, Mercurys, Everest and Londons with prices commensurate with their rarity. $19.99 to $99.99 was a little rich for my blood, but I had fun looking them over. Conspicuous by their absence were the “killer” Reiner RCAs. Where have all these gone? I spent a good deal of time here browsing the bins and was rewarded with the discovery of the Bagdad Cafe soundtrack for $3.99. It, along with several other jazz, classical, and Irish music LPs, were put into the Harvard Coop shopping bag, which now was beginning to take on some weight. With my wallet a bit lighter, I climbed up the stairs from Looney Tunes and headed for Sandy’s Music, a focal point for lovers and performers of all types of acoustic folk music.

The walls of Sandy’s Music are lined with guitars, mandolins, banjos, dobrobs, and other stringed instruments. The countertops are strewn with sheet music, strings, picks, and other paraphernalia related to string instrument performance. The store is disorganized and dusty (the smell reminded me of the music store in downtown St. Louis where I used to hang out in my younger years waiting for my trumpet lessons). The store’s ambiance reeks of the performing musician. Directly across from the counter are the record bins, filled with all sorts of exclusively acoustic music of a folk or ethnic nature. Cajun bands and Irish and Scottish fiddle music are found in abundance. Old-timey string band records can be found next to historic country & western. I liked this store a lot: the music they sell is music I’ve been attracted to in recent months. Prices were slightly higher here than elsewhere, but they had the hard-to-find imports. I left with a bagful of records I found nowhere else in Boston, including a marvelous LP of Irish fiddle tunes performed by Seamus and Manus McGuire, Humours of Lissadell (Folk Legacy FSE-78). I felt especially happy finding a copy of The Wandering Minstrel (Topic 12TS250) by the legendary Uilleann piper Seamus Ennis. (Back in Santa Fe, when I cued up this record, I was instantly transported to a musty pub in Ireland where a piper was performing for a group of happy pub-hounds surrounded by their favorite brew. I love this music!)

A return trip to Cheapo Records confirmed my initial impression that this is the best store around for new records of all genres (except classical; they got rid of them some time ago). The only other record store I’ve ever been in which had as large a selection of more obscure LPs is Down Home Music in El Cerrito, California. Cheapo has deep stock of virtually every domestic and import independent-label LP. A few used records can be found in the basement, but the selection was poor. I didn’t waste time browsing through them because I was losing my mind with the opportunity to scan the bins for records I may never see again. The staff here loves LPs and has an encyclopedic knowledge of the music they sell. I was told that as pressing plants around the world continue to close down, the availability of these records will cease, with the current stock, in all likelihood, the last we will see—forever. Sad thought, that. Upstairs, across from the check-

2 Readers should be aware that Guy finds a love of Celtic music in a woman a prerequisite for any kind of relationship. I just thought you should know.

—JA

Stereophile, December 1990
Mondial Designs Ltd. introduces Aragon Mark II 004 Series Amplifiers

Last year we introduced the new version of the Aragon 24k preamplifier. It's musicality, engineering, component and construction quality clearly places it with preamplifiers costing over $4000.

This year we introduce the Mark II 4004 and 2004 amplifiers. Advances in the circuitry include automatic bias control independent of line voltage. Noise and distortion have been reduced with engineering advances, not signal correction such as negative feedback.

All original 004 series amplifiers can be upgraded to Mark II technology. Proof, once again, that the acquisition of Aragon components is an investment in the future of audio.

Mondial Designs Limited
2 Elm Street Ardsley NY 10502 • 914-693-8008
out counter, are enough Bear Family boxed sets to quicken the pulse of any lover of early rock & roll and blues. Jerry Lee Lewis, Fats Domino, Muddy Waters, and Eddie Cochran boxes share shelf space with the Riverside recordings of Bill Evans and Thelonious Monk. I was beginning to get dizzy, so I gathered up my purchases and left with deeply etched memories of this store.

My Harvard Coop bag was now getting quite heavy, so I decided to return to my room to unload my treasures. Not without a return trip to Looney Tunes on Boylston, though! I shouldn’t have stopped—they’d restocked the classical bins and I couldn’t resist the urge to browse. When I left, with a few Astrées and Telefunken's added to the collection in my bag, I knew it was time to call it a day: I was looking forward to attending a concert at Boston Symphony Hall that evening.

There’s nothing like the real thing when it comes to performed music. Try as we may, we audiophiles fall far short of capturing the live experience with our expensive equipment. If you don’t believe me, go to a symphony concert as soon as possible and listen for yourself.

Lush, full-bodied string sound, biting brasses, lilting woodwinds, and dynamic percussion define the BSO. From my seat in the hall, I was surrounded with the most magnificent sound I have heard. The ebb and flow of the music was conveyed wonderfully. The sound of the orchestra was not dissected into fragments with pinpoint imaging, as we have come to expect in our quest for the best sound. On the contrary, the sound swelled forth from the stage like a large wave, enveloping all those within its path. Bernard Haitink was guest conductor in a program of Copland’s Appalachian Spring, Beethoven’s Piano Concerto 4 (Maurizio Pollini the soloist), and Stravinsky’s Petrouchka. The Copland was only so-so, the Beethoven sparkled with life (what a fine pianist Pollini is), and the Stravinsky was enjoyable, despite some flubbed solo trumpet passages.

What particularly struck me concerning the sound of the orchestra was the impact of the percussion section in Petrouchka. When the bass drum was struck, it sounded as if an entity with extremely large mass was trying to enter Symphony Hall through the rear wall of the stage. I could feel the impact of that drum from my seat at the rear of the hall! Nothing in my listening experience of electronically reproduced music has ever had the same effect on me. It brought me back to the reality that hi-fi is only an illusion, a shadow of the real thing. I urge every audiophile to attend live concerts as often as possible to hear the magic for him or her self.

Commonwealth Avenue has two excellent shops within easy walking distance of each other—Planet Records and Nuggets. Planet is my choice here, as it is cleaner, has better lighting, is better organized, and has a decent selection of used classical LPs. I added a few more Telefunken’s to my bag and spent a long time browsing the jazz, soundtrack, and rock sections. Long-out-of-print jazz boxed sets lined the walls, along with equally rare rock boxes. This store has an extremely comprehensive selection of rock and soul titles, and when it came time to leave, I didn’t want to go. Planet Records is well worth a return trip, especially for the lover of pop, rock, and soul.

What Nugget Records lacks in sophistication it more than makes up for in character (including the clientele). You walk down into the store through a door which opens onto a birds-eye view of the place. The first thing you become aware of upon entering is the sound level of the music (?) being played—loud and low-fi. It was also, on my visit, punk rock—a genre which I find hard to accept. Consequently, I didn’t spend much time here, but I managed to find a copy of Prince’s Black Album, a Loudon Wainwright III, a Eugene Chadbourne album of bizarre covers of C&W songs, and an Irish import of the Bothy Band. Quite an eclectic mix of music found in quite a different kind of store. Definitely worth a return trip if you’re strong-hearted! Plan on spending time here, though, because the records are poorly organized and there is very little aisle space—two factors which make record browsing difficult.

My stay in Boston was too short, but I left with the feeling that vinyl records could be found in abundance here (excluding new classical releases). I returned to Santa Fe with over 25 lbs of vintage LPs, by then carried in a reinforced Harvard Coop shopping bag. I totally enjoyed my visit, especially the BSO concert on Saturday night, my girlfriend’s daughter’s recital at the New England Conservatory, and the overall hustle and bustle of the place. Good food, good friends, good music, and good conversation all added up to a most memorable trip. I hope to return soon with a larger, stronger shopping bag!

Stereophile, December 1990
Highlights of the review:

Over the years, B & K Components, Ltd. has become one of America’s leading manufacturers of affordable, high-quality audio electronics. B & K has done an admirable job of providing musical, reliable preamplifiers and power amplifiers within the budget of virtually any music lover.

“I was floored by the M-200’s sense of pace and drive.”

Impressed as I am by the MC-101, I find the Sonata M-200 monoblock power amplifiers on test here even more remarkable. The M-200 is John Beyer’s effort to build a power amp that can drive virtually any loudspeaker load in existence. Rated at 200 watts into 8 ohms and 400 watts into 4 ohms, the M-200 can drive loads as low as .75 ohms and still pump out its rated 200 watts! Rated peak current output of the M-200 is an incredible 150 amperes. This might come in handy should you need to jump-start your Peterbilt on a frosty morning.

Internal construction is most impressive, with a massive, shielded toroidal transformer centrally sited within the steel chassis. Four filter capacitors, each roughly the size of the oil filter on my Honda, combine to offer nearly 70,000 mfd of storage capacitance. The input and driver circuits are carried on a single glassfibre board that sits atop the power supply caps. A plastic panel bearing a silkscreened schematic of the amp covers this board. As with B & K’s other power amps, the M-200 utilizes MOSFET output transistors. In keeping with the M-200’s beefy design, no less than twenty of these devices are fastened to the amp’s external heatsink. Quality (Corning or Dale) 1% metal film resistors and premium film caps are used throughout the active circuitry. A gold-plated premium input jack is included, with gold-plated five-way binding posts handling speaker cable connection.

A good power amplifier will let you appreciate the rhythmic drive of Tommy Shannon’s bass guitar, but it takes an outstanding amp to make the pitch of the instrument clear. The M-200 is such an amp.

“I was bowled over by its combination of smoothness (a B & K hallmark) and detail.”

All too often extremely powerful amps excel on bombastic symphony works, but fall down when it comes to conveying the subtlety and nuance of “smaller” music. The M-200 proved to be a glorious exception. Yes, the massed brass and great whomping bass drum shots in “Uranus, the Magician” were appropriately startling, but equally satisfying were the quiet flute and
violin passages that weave through this performance. Delicate instrumental shadings and nuances that are so important in communicating the emotion of the music were never glossed over or homogenized. The M-200 had that essential ability to draw me further and further into the music, rather than hurling it in my face. Equally impressive was the M-200's soundstage width and depth, as the size and power of the orchestra were communicated to great effect.

The M-200 was superb in its capacity to capture the (real and artificial) reverb on this track [Iggy Pop's New Values], helping to convincingly communicate the mood and tension of the composition. Pop's vocals were rich and resonant, while the synthesizer lacked the slightly harsh, piercing character imparted it by lesser-quality amps.

Obviously, I was extremely impressed by the B & K M-200. While offering the tonal naturalness that characterizes all B & K products, the M-200 goes far beyond previous B & K amps in its outstanding bass quickness and definition, as well as its excellent retrieval of low-level detail and recording acoustic. There is a fundamental quickness and alacrity to the M-200 that makes music more immediate, more compelling.

John Beyer tells me one of his competitors pays three times as much as B & K for the same Noble volume pot. These additional costs are passed on to the consumer in the form of higher retail prices. Of course, those small-volume manufacturers committed to meeting a specific price point may have to employ inferior-quality parts to stay within budget; their inability to make large parts purchases means they may actually pay more for parts inferior to those used by high-volume manufacturers like B & K, Vandersteen, etc.

B & K has undertaken the ... daunting task of manufacturing and marketing affordable equipment in numbers sufficient to ensure a reasonable return on invest-ment. B & K's profit per unit may be modest compared to that of the typical "High End" component, but the company has achieved unit sales (and consequent profits) that are quite astounding for a specialist manufacturer. Equally impressive is the fact that Beyer hasn't compromised his products' integrity to achieve commercial success.

The above is a roundabout way of explaining the significance of B & K's new Sonata series. Beyer has now committed B & K's manufacturing efficiency and economies of scale to producing audio components that challenge the best "High End" marques.

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Sonata Series

B & K COMPONENTS, LTD.
1971 Abbott Road
Lackawanna, NY 14218
1-800-543-5252
(NY: 716-822-8488)
(FAX: 716-822-8306)
Sound Mathematics is the use of superior quality components, innovative circuit design, and hand built craftsmanship resulting in sonic excellence. Hafler products employ high gain, wide bandwidth J-FETs with vacuum tube characteristics. The power supplies utilize low stray magnetic field transformers and high-energy storage capacitors for massive power reserves. In the Hafler tradition our amplifiers use lateral MOSFET output devices to deliver the midrange clarity and musicality of tubes with the improved bandwidth and speed of transistors.

Pure. Refined. Natural...The Hafler SE100 J-FET Preamplifier, SE130 AM/FM Tuner, SE150 CD Player, SE120 and SE240 MOSFET Amplifiers represent the new line of Hafler products. We await your listening evaluation of Hafler’s SE series components. Sonic Excellence at an affordable price.
I was first totally transfixed by a musical performance at the age of 13, lying face-down on the family’s living-room floor holding to my head a pair of 3’-long homemade conical cardboard cones. The small ends were held to my ears, while the large-opening ends were positioned over the two speakers built into a console television/stereo unit. My older brother Steve contrived these appendages to maximize the music at one’s ears while minimizing the “noise” made by other family members. This arrangement, however crude, provided my first glimpse of music’s beauty and power, and set in motion a lifelong passion for music and music recording and reproduction technology.1

The console stereo/cardboard ear extenders soon gave way to a gray portable unit with a fold-down turntable and a pair of headphones. The only music available to me (before I started buying my own records) was my brother’s collection, which consisted primarily of Frank Zappa records. For the first two years of my music-listening life (ages 13–15), I heard virtually nothing but Zappa (mostly his instrumental music) through headphones. At the time I saw nothing unusual about this.

The more I listened, the more I realized the cheap portable stereo had to go. A paper route helped provide the means to replace the K-Mart special with what Steve and I considered a major sonic breakthrough: a 15Wpc Heathkit amplifier, Garrard SL-55B turntable, and a pair of Koss headphones.

At about this time, I bought the soundtrack to the film A Clockwork Orange, which featured orchestral music as well as synthesized music performed by Wendy (then Walter) Carlos.

1 Steve is very talented musically (he has a degree in composition) and always played instruments in the house. He also experimented with guitar electronics and built loudspeakers, which undoubtedly was the source of my interest in audio technology.
What is the proper way to get an audio-cable test-team into a state of exaltation?*

Select the ultimate cable material - silver in the purest form available - and reject the idea of getting the maximum length from a given weight, because only then will the crystal structure remain unimpaired.

In short: make the uncompromising cable, in other words: Siltech cable. Result: frighteningly close to no wire.

*See HiFi News & Records Review June and July 1990

SILTECH: P.O.Box 31165, 6503 CD Nijmegen, The Netherlands, Fax Int.+ 3180233031.
I immediately bought Carlos's *Switched-On Bach* and, for the first time, heard the music of Johann Sebastian Bach. It was a revelation. The next step was to buy Bach's music performed on the instruments for which it was written. Thus began a period of listening nearly exclusively to Bach and Zappa for hours a day. From Bach, I discovered other classical music. What is important about this experience is that, because I wore headphones, I considered music listening as something to which one devoted one's full concentration. Teenagers typically hear music as background to other activities rather than considering it the activity itself. Music thus becomes trivialized, a kind of aural wallpaper that demeans the composer/performer.

To finish up this twisted musical biography in one sentence, I got a job selling hi-fi, took a degree in recording engineering, built and operated a recording studio, taught a college recording program, worked in CD mastering, then joined *Stereophile*. Along the way, my playback system improved and I gradually became more and more of a tweak, despite the derision of my colleagues.

My musical tastes and listening habits today certainly reflect my formative years. I tend to like music that demands one's full attention while also requiring a high degree of musician-ship to perform. Most of my early listening was to instrumental music, which I still prefer today over vocal-oriented songs. There are some exceptions, notably Joni Mitchell.

The mainstay of my musical diet today is jazz. After first being exposed to hyphenated jazz (jazz-rock, jazz-fusion, etc.), I incorporated straight-ahead jazz into my record collection. My horizons broadened as I discovered players like Charlie Parker, Dexter Gordon, Stephane Grappelli, Kenny Burrell, and Bill Evans. Of the vast range of musical experience, nothing does it for me like someone improvising full-force at the cutting edge of their skill. There is something very special about improvisation that cuts to the core of what music is all about. The music flows directly from the performer to the listener without the hindrance of intellectual baggage.

As much as I like "traditional" jazz, I listen to a lot so-called "fusion" music, as exemplified by bands like Weather Report, Return to Forever, and Steps Ahead. Chick Corea has been a long-time favorite. Although I don't like everything he's done, he has produced a terrific body of work and has brought many young, highly talented players to prominence in much the way Miles Davis did. (Corea himself was a product of Miles's band in the late 1960s.)

I also like high-energy latin-influenced jazz and the infectious energy and rhythmic intensity of Brazilian music. Flora Purim and Airto, Azymuth, Tania Maria, Gilson Peranzzetta, and Sebastião Tapajos are among my favorite Brazilian artists. I also like blues, especially blues guitarists like Johnny Winter, Robben Ford, Stevie Ray Vaughan, and old Eric Clapton. Much of the music I listen to is fairly obscure due to its limited commercial success. Wishful Thinking, Scott Kreitzer, Les De Merle, and Roland Vasquez are good examples of less-well-known groups or artists I like.

One group that has been a favorite for the past ten years is a little-known band called The Dixie Dregs (later called simply The Dregs). Known mostly to musicians, the Dixie Dregs' music is an astonishing blend of disparate musical styles combined with ferocious technical virtuosity and compositional brilliance. Although their music defies categorization, one could describe them as a jazz-rock-bluegrass-classical group. The instrumentation consists of guitar, violin, keyboards, bass, and drums. The broad range of influences that resulted in this unique musical amalgam is reflected in the background of composer and guitarist Steve Morse: he grew up in the south with country musicians, was influenced by rock players of the day like Jimi Hendrix, is classically trained (a degree in composition), and went to the jazz-oriented University of Miami. The band was also heavily influenced by John McLaughlin's Mahavishnu Orchestra. Steve Morse is, in my opinion, the most accomplished electric guitarist today and has won *Guitar Player* magazine's Overall Best Guitarist award for five consecutive years. If you decide to try The Dixie Dregs, I'll give you fair warning: people tend to either dislike their music intensely or become fanatical devotees.

I'll sum up my musical tastes with a quote from Charles Ives: "Beauty in music is too often confused with something that lets the ears lie back in an easy chair."

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2 Check out Tapajos and Peranzzetta's album *Lado A Lado* (Visom Digital CDV 2), a beautiful collection of piano and acoustic guitar duets.

3 A brief Dregs discography: *Freefall*, *What If*, *Night of the...*
When your audio/video needs are unique or extensive

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So, if you’re ready to get more than what you pay for when it comes to purchasing high-end audio, call our Exceptional Sounds specialist at any of the Sound Advice locations listed below:

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Fort Lauderdale: Steve Zipser 4008 N. Federal Hwy (305) 564-4434
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Tampa: Wayne Augustin 1102 East Fowler Ave. (813) 971-4434
Orlando: Mike Graves 4835 East Colonial Dr. (407) 894-4434
Moving on to my reviewing methods, I have found that the more I like the music, the more I care about how well it is reproduced. Consequently, I listen to very few "audiophile" records when reviewing, unless of course I like the music. I can tell more from a poorly recorded record of great music than from a pristine recording of music I find uninteresting. However, the combination of terrific music and superb recording, played through a great system, is transcendent. I'm a fan of live recordings and live-to-2-track records. Besides being purer sonically, they capture the energy of a performance in a way overdubbed recordings can't. I tend to use the same recordings over long periods when evaluating equipment. Because there is so much variation between various recordings' tonal balance, spatial information, and other aspects, a particular sonic character cannot be ascribed to a component unless that recording is known intimately and has been heard on a wide range of other equipment. Consequently, new recordings tend to make their way slowly into the reviewing repertoire. I am most heavily dependent on recordings I have made myself. This is not because I think my recordings are especially good, but because I know their flaws and have the reference in my memories of what the instruments really sounded like and of the feelings created by the original musical event.

My playback system represents the culmination of the past year and a half of reviewing. Equipment I like stays in the listening room until something better comes along. It's a good idea to keep a piece of equipment for an extended period after the review to reassess your feelings for the product. So far, my positive opinions expressed in print about certain products have been reinforced by living with them for many months.

The current reference system includes the Hales System Two Signature loudspeakers driven by VTL 225 Deluxe monoblocks. Both these products received very favorable reviews, and my high opinion of them has only increased after months of daily use. The VTLs are superb amplifiers, and I have yet to hear anything that even threatens to displace them. I tend to prefer tubes over transistors, although I have heard good-sounding solid-state equipment. The Hales Signatures are particularly good for evaluating electronics upstream because of their transparency and resolving power. More important, they produce an involvement and intimacy with the music that makes going to work in the morning something to look forward to! (JGH and I are Stereophile's only full-time salaried equipment reviewers.)

The digital front end is an Esoteric P-2 CD transport driving a Theta DSPro Basic processor. Although I think the Stax DAC-XIt is the best digital converter currently available, the DSPro Basic is the second-best digital processor I've heard and is much more affordable. Stereophile also has a JVC DAT machine that floats between reviewers for auditioning digital converters at the 48kHz sampling frequency. Some of my original master tapes are on DAT and recorded at 48kHz. I've experimented lately with digital interconnects from Aural Symphonics and an optical cable from Audio-Technica.

My analog source changes according to what's available at any particular time. Currently I use a Well-Tempered Turntable and arm (formerly in LA's system) with a Sumiko Virtuoso Boron cartridge. At the top of my audio wish list is a first-rate turntable/arm/cartridge I can leave permanently set up in my room. A Versa, Basis, or Goldmund will do. Most of my favorite music is on LP and unavailable on CD. Generally, I prefer LP playback over CD, a gap that would significantly widen with a no-compromise analog front end.

The moving-coil phono signal from the Sumiko is stepped up by an Expressive Technologies SU-1 transformer, an outrageous 35lb device. It then feeds an Audio Research SP11 Mk.II preamp with Expressive Technologies IC-1 interconnects throughout the phono chain. The SP11's tape outputs drive the Electronic Visionary Systems Stepped Attenuator, a passive control unit. The combination of the Well-Tempered, Sumiko, SU-1, IC-1, SP11, and EVS passive unit provide phono playback that is transparent, detailed, and musically involving. The Theta DSPro Basic's outputs drive the Stepped Attenuator's other input. After listening to the transparency of just a resistor to ground instead of an active preamplifier for CD playback, you're addicted.

Stereophile, December 1990
Speakers are the most important part of your stereo system. It is the speaker that turns amplifier signal into sound and so ultimately determines what you hear. If your speakers do not perform well, your stereo system will simply not sound like music.

The search for musically satisfying speakers, however, can lead to some very expensive products. And if you have already bought those high priced speakers, then you better not listen to Paradigms. But if you haven't, better not miss them. Why? Because from the time they were first introduced, Paradigm's sheer musical ability utterly amazed listeners... but what caused even more amazement was the unprecedented low price.

Now you can settle for more... without more expense. Visit your authorized Paradigm dealer... and listen.

The critics agree:

"... the Paradigm 5se is no more colored than speakers costing up to two or three times its price, and gave a consistently musical presentation...
Conclusion: the Paradigm 5se offers excellent performance at a very competitive price...
- John Atkinson/ Stereophile Vol. 11 No.1 January, 1988

"... natural, open and clear... excellent depth... lots of hall sound... big, expansive soundstage... well defined... a rare achievement for any loudspeaker, but when the price is taken into account the Paradigm's performance must be considered as nothing short of remarkable...
- Sound & Vision Magazine
Speaker cable consists of 3' runs of bi-wired AudioQuest Clear, and the interconnects driving the VTLS are the Expressive Technologies IC-1. This is extraordinary interconnect that reveals detail and timbral shadings I never knew existed in my music collection. I also like AudioQuest Lapis. Although not in the same league as the IC-1 and Lapis, Music Metre makes a good-sounding cable at a reasonable price ($95/meter-pair).

One aspect of a music playback system that has a profound effect on the musical experience is the listening room. When my wife and I moved to New Mexico and built a house, a top priority was a good listening room. It is a great luxury to pick a room's dimensions and layout with music listening in mind. Although not huge, my listening room conformed to our budget, is representative of the size rooms in which most people will hear the same equipment I'm reviewing, and is very close to the IEC recommended dimensions for a standardized listening room.

The 21' by 14.5' dimensions were chosen for best distribution of room resonant modes. The sloped wood ceiling—which really helps in eliminating floor-to-ceiling standing waves—starts out at 8' and reaches 12.5' at the top. The room is slightly odd-shaped rather than having square corners, further skewing resonant modes. Behind the room's single chair, a 3'-deep closet stores equipment and a desk. The closet is covered by bi-fold slatted doors that, when partially open, help in diffusing high frequencies. The closet was designed with the idea of making it into a quarter-wave bass trap. (Our builder advised against putting "bass trap" on the plans the bank would see!) By hanging absorbing material at the closet front, low frequencies are attenuated whose wavelength is one quarter the distance between the trap's rear wall and the absorbing material. Peak absorption also occurs at odd multiples of a quarter wavelength ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ wavelength, etc.).

A berber carpet on heavy pad covers the floor, and the walls are treated with a very thin carpet-like material to remove brightness and kill high-frequency reflections. This carpet is nearly identical to an "acoustical" material that sells for three times the carpet's price. The carpet is thin enough so that the room is far from dead, a common mistake in treating rooms. Low-frequency absorption is provided by a pair of Phantom Acoustics Shadows placed in the corners behind the loudspeakers. (This active system for controlling low frequencies was reviewed in Vol.12 No.12.) The room's sheetrock walls also provide some needed low-frequency absorption through diaphragmatic action.

An advantage to living in the mountains far away from roads is the exceptionally low ambient noise level in the listening room. A quiet room reveals soundstage information not heard when masked by traffic or other noise. Besides, I don't have to worry about disturbing the neighbors!

In its present form, the room is excellent. Stereophile reviewers and manufacturers who have visited have generally agreed that the room sounds good. However, I intend to take the room a step further with the addition of RPG Diffusors. Some samples are on the way; I'll be interested to hear and measure their effect. Watch for an article soon.

As far as my preferences and sonic priorities in music reproduction go, I heartily agree with J. Gordon Holt's dictum: "If the midrange isn't right, everything else is meaningless." Next to midrange aberrations, what bothers me most about most reproduced music is harshness, glare, and unnatural brightness in the upper octaves. Screechy strings, spitty cymbals, and sibilant vocals are perhaps the biggest impediment to enjoying reproduced music. This character is often heard in reproduced music but never from the instruments themselves. I find that components (and recording engineers) err on the side of excessive brightness much more often than too little HF energy. Soundstage presentation and a sense of space are important to the musical experience, though this is irrelevant if the tonal balance is wrong. Although I like the transparency and imaging of planars, I also like the sense of dynamics provided by moving-coil loudspeakers, especially for the type of music I enjoy most.

However, it is the contribution these aspects make toward the total musical experience, rather then the aspects themselves, that are important. To focus on soundstage depth instead of the music's expression is like eating the menu, not the meal.

4 I'm constantly amazed to discover things that Gordon wrote about music reproduction decades ago that are truisms today. Although we differ musically, his insights about music reproduction (many of which were made when I was a toddler) have made enormous and invaluable contributions to the field.
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"Magnepan did a bit of show-stopping of their own at the Palmer House. The new MG3.3, which replaces the MGIIIa, produced one of the best sounds at the show, with striking imaging and depth."

(Thomas J. Norton in Stereophile, September, 1990, Vol. 13, No. 9)

"MAGNEPLANAR. In my own jaded opinion, next to the Essence with its master tapes, the Magneplanar suite had the best sound at the entire show. Secluded over at the lush Palmer House, in a conference room of generous proportions, the new MG2.6 made fantastic and beautiful music with as much clarity and focus as I have ever heard from a planar, much less one for under $2000 (!!!)."

(Bound for Sound, June 1990)
BOOK REVIEWS

Hit Men: Power Brokers and Fast Money Inside the Music Business
by Frederic Dannen
387 pages, $19.95 hardcover. Published by Times Books, 201 E. 50th St., New York, NY 10022.

If we are judged by the company we keep, then the leaders of the recording industry are in trouble. The title characters in Hit Men are the members of the Network, a syndicate of so-called "independent record promoters," many with ties to organized crime. Network members can't make a hit, but they can keep a record from becoming a hit by denying it airplay at key radio stations, as the incident that opens the book illustrates.

In early 1980, Dick Asher, then deputy director of CBS Records (and later chief of PolyGram's U.S. operations), tested the Network's power by withholding indie promo money for Pink Floyd's "Another Brick in the Wall" in Los Angeles, where PF's tour would begin, while paying the usual push money elsewhere. The single was drawing favorable listener responses at Top 40 stations around the country; the album was number 1 on the Billboard chart; and all five LA concerts were sold out. Yet not one of the four Top 40s in LA was playing it. When Asher relented, the record was on three of the four within hours.

Asher, one of the few sympathetic figures in the book, disliked the indie system. Though the promoters' contracts forbade them to deal in payola, that was just a legal device to protect their clients. It was widely assumed that they corrupted program directors with cash — and sometimes with drugs. But by 1980, Asher had another reason to try to break the system. In the post-disco crash, indie services were costing too much money.

But Dannen argues persuasively that, unlike Asher, many major label executives—some of whom, like Asher's boss, Walter Yetnikoff, and Roulette Records' Morris Levy, were personal friends of the indies—actually liked the system, no matter how much they complained about the cost, because it was too expensive for the smaller independent labels. And in fact, the decline of the small labels' market share closely parallels the rise of the Network.

As the biggest firm in the business until 1986, CBS Records figures prominently in the narrative, starting with its role in the CBS/Philadelphia International payola scandal of the early '70s. Dannen thinks Federal bungling of that case paved the way for the development of the Network system later in the decade. CBS also undermined industry efforts to curb the system in the mid-'80s, when it was becoming too expensive for some of the other majors. Then in 1986, when NBC News reports linking Network men with the Gambino crime family made all the majors wary of direct dealings with them, the label pioneered an ingeniously circuitous ruse for holding on to the anti-competitive advantage the system afforded them: CBS acts would receive advances against their own royalties, ostensibly for "tour support" and related expenses, and be encouraged to use the money to hire the indies themselves. Thus the company would avoid direct involvement while saving money at the expense of its own artists!

CBS Records President Walter Yetnikoff, who engineered both the firing of Dick Asher in 1983 and the sale of the CBS labels to Sony in 1987, is reportedly upset not only at the way CBS is depicted in the book but also at the unflattering contrast between himself and Asher in Dannen's account.¹

Still, CBS does not emerge as the least admirable outfit in the book. That distinction belongs to the premier disco label of the '70s, Casablanca. PolyGram acquired a 50% share of Casablanca in 1977 and the rest in 1980, and Casablanca's losses nearly broke PolyGram. It happened because of bad business practices — and even worse pleasure practices. Dannen describes the label's now-vanished headquarters on Sunset Boulevard as a "Moroccan-style funhouse that rocked with disco and rolled with controlled substances."

Sex, drugs, and rock'n'roll? There's not much sex, except for the anecdote about Janis Joplin offering to sleep with Clive Davis to "consume" a record deal, and the occasional references to Yetnikoff's multiple marriages and the stable of girlfriend's he calls his "shiksa farm." But there's plenty about drugs and rock'n'roll —

¹ Coincidentally, Yetnikoff was released from his contract in September.

—JA

Stereophile, December 1990

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DENY
and about corruption. Such are the people who have arrogated to themselves an inordinate influence over our popular culture.

Those readers who are too sophisticated for trendy Top 40 music, or for any form of pop, are nevertheless affected by the decisions of these music moguls. Warner's abortive attempt to merge with PolyGram, for example, was motivated by Warner's early interest in the CD. If Warner and CBS had seen little value in the CD format, the CD might have remained a specialty item.

For anyone who cares about the state of the record industry, or about the state of mass culture, Hit Men is indispensable.

—Jack Hannold

"Having listened to the most recent Krell Digital MD-1 CD transport and the 64-times oversampling processor, I am very happy with the progress digital is making. Besides, digital can only get better. I know analog is still superior, but as things stand right now, digital is good enough for me." With that, Hy Kachalsky announced that every one of his several thousand LPs was for sale.

You’d have thought that such a decision, by the president of a very prestigious, very analog-leaning organization like Westchester County’s Audiophile Society, would have met with howls of indignation. Far from it—his announcement was received with open arms, as all the members rushed into Hy's den to get what they could.

The resulting bustle and the rate at which his records were snapped up attested to the popularity of his decision. Those analog agnostics who view Hy’s decision to sell his records as a loss of ground for analog are misguided—every purchase turned out to be an endorsement of that beloved medium.

Once more, the dedication of analog aficionados was confirmed. Not that it was ever suspect. However, I do feel that their preoccupation with software supply problems can come back to haunt them.

All the vinyl in the world is sure to lose much of its luster if playback equipment is not equal to the task of making the recordings come alive. While the gravity of the software supply situation is undeniable, we can’t neglect the equipment side of the equation. It’s not too farfetched to consider the premise that all the great recordings that are ever going to be released have, indeed, been released. Like it or not, every LP is a potential treasure and deserves to be explored to the fullest extent possible. Having said that, I can’t think of a better product to submit for your consideration than the Basis Debut Gold Standard turntable.
I was first introduced to the Basis turntable at *Stereophile's* 1987 High End Hi-Fi Show in NYC. Much to my surprise, I discovered that two prominent manufacturers, Apogee and Krell, had included the same unknown turntable in their display systems.

I remember it only too well. There was Jason Bloom in the Apogee suite playing his famous records on an absolutely stunning turntable as he showed off the Apogee Divas! Not far away I found the same turntable in the Sound by Singer display as the front end of their all-Krell system. You can rest assured Dan D'Agostino had a say in that decision.

One thing was certain, these exhibitors had excellent taste. The selected turntable was a knockout, sleek and elegant. I watched Jason in action—the Basis was straightforward and simple to use. It was also functional, exuding strength. Best of all, show conditions or not, the sounds I heard were first-rate.

"Where on earth did you dig up this work of art?" I asked Jason, remembering his previous association with the art world.

"Funny you should ask. The designer just happens to be right here. I want you to meet A.J. Conti of Basis. Here's a man who I think you'll be hearing a lot more about in the future."

As luck would have it, when I returned to the Apogee suite at the end of the show for a last listen, they were in the process of tearing down their exhibit. As I approached A.J., I noticed that he was already packing up his equipment. I watched with fascination as he pulled up the armboard with the tonearm out of a recess in the subchassis, and remember being struck by the convenience of this arrangement. In about 15 minutes flat, A.J. had the whole turntable apart and packaged for shipping. Fortunately for me, he had taken the time to explain every step of the dismantling, throwing in pertinent comments about the inner workings of his design.

I was impressed by what I'd seen and by what A.J. had told me. I was hard pressed to recall another instance where fit, finish, and function had been more effectively combined. This was clearly one of the best testimonials to the form-follows-function principle to appear in a long time.

The engineer in me was gratified to learn that the design of this turntable is based on sound engineering fundamentals; performance considerations were always the first priority, everything else taking a back seat. It is to A.J.'s credit as a designer that he has been able to elicit such appealing looks for his product despite these constraints.

The Basis Debut Gold Standard turntable is proof positive that designer A.J. Conti is a gifted high-end innovator. The Basis is both a sight to behold and one of the most remarkable high-end products to come along in quite some time. Don't for a moment consider this turntable to be just another pretty face. Under the stunning exterior is a product of landmark proportions.

**A.J. Who?**

Interestingly enough, A.J. did not start out with a firm plan to design a new turntable.

How many individuals can lay claim to having solid experience in design, sales, and production of highly precise equipment, while at the same time operating an audio retail store and picking up additional expertise specifically related to high-end products and marketing? A.J. Conti can.

A.J. started out as a designer of high-energy laser equipment. Then, with a company building aerospace electrical assemblies, he rose to the position of Director of Production in just four years. Stops at product development, manufacturing engineering, and sales manager rounded out his background.

While he may come to the high end particularly well prepared by this engineering background, his keen interest in audio—by his own admission, he is an audio fanatic—is the underlying force behind his present preoccupation with turntables. From time to time, to satisfy his curiosity, he would take a component apart. All he had in mind was a closer look—a design review, if you will—of the turntables he sold. Before long A.J. was scrutinizing every turntable he came across, then redesigning them mentally to fit his considerations. But more significantly, he kept track of the strengths and weaknesses of the products he encountered.

What he found was fascinating: even though each of the turntables had at least one strength none of the others had, no *one* product "put it all together." Certainly food for thought.

He didn't know it at the time, but the design of the Basis turntable was kicked off in January of 1986 when A.J. created his "ultimate plat-
ter'"; the armboard was next and, shortly thereafter, the bearing. One at a time—he did not have a defined entity yet—A.J. proceeded to develop each component part.

Despite this lack of a final vision, A.J.’s ideas of what he was after in his ultimate turntable were very clear. Above all, he valued two characteristics: it had to be a tweak-free product, and the performance of any tonearm had to be optimized and protected from outside influences. That this product would be reliable as no other product before it was a foregone conclusion.

The turntable suspension turned out to be the hardest nut to crack. He researched suspensions employing air, magnetic damping, hydraulic damping, springs stuffed with foam, and springs stuffed with metal wool. No cigar. They all suffered from imperfections and non-linearities.

At last he decided to go back to the textbooks and design his own linearly damped vibration-control system.

Reaching all the way back to his college courses, A.J. recalled that, of all the physical properties he studied, viscous damping was one that behaved as close as possible to the ideal. Similarly, a steel spring can also be expected to behave in a very predictable manner. By combining the two, where a spring in tension is surrounded by silicone to provide the desired viscous damping action, A.J. created the hanging fluid-damped suspension used in his products.

A.J. is convinced that this type of suspension is vital to a properly performing turntable. "Using a turntable without this type of suspension is like driving a car without shocks," he declares. He feels that the Basis turntable is the first and only product to use these back-to-basics principles which, he feels, are the foundation for its success.2

Once all the individual components had been designed to A.J.'s satisfaction, he saw the way clear to combine them into a functional and cosmetically appealing entity. As this was his first product, he named it the "Debut."

The rest is history
A prototype incorporating all of A.J.'s ideas was produced posthaste and shown to his customers and local dealers in July of 1986. The reception was so encouraging that the next stop was the 1987 Winter CES in Las Vegas. The response? Product was being shipped by August 1987.

A.J. has been on his own since 1988. There is no more retail store, and he has resigned his previous professional position. Basis Audio Manufacturing is now his sole bread and butter, and receives his undivided attention.

That kind of attention has resulted in the improved Gold Standard version of the original Debut design, and a lower-priced model, the Ovation. The Ovation is a stylistic knock-out, without borrowing from the original or skimping on any substantial area of design. Yet at $3750, the price is practically cut in half.

A.J. is emphatic about his long-term commitments to present and future customers. After explaining that his material and production costs can be very manageable even for small production runs, he made it very clear that he will continue supplying products as long as any demand exists.

Could it be more than a Gold Standard?
A great deal of the appeal of analog playback equipment has to do with the exposed presentation of the component parts—what you see is what you get. The Basis Gold Standard Debut turntable illustrates this premise emphatically. One look and it’s obvious—something very special has been created here: all the loose ends have apparently been thought out and tied down; everything gels naturally into one functional final entity.

But another aspect deserves equal attention—versatility. The Basis is extremely simple to set up, is about as tweak-free as can be desired, and interfaces with any tonearm on the market. Basis has managed to create a state-of-the-art playback component that can be prepared to play records in less than an hour. To be sure, a little mechanical aptitude is helpful for that time-frame, but that kind of claim cannot be made for too many products as it is, much less a turntable.

Of course, it's not the time perse that matters—after all, setup is a one-time, up-front effort—but I feel this is the best place to start telling the story of the thoroughness and completeness exhibited by the Debut.

2 Of course, SME has a fluid-damped turntable suspension, but it uses a rubber derivative to suspend the subchassis. According to A.J., unlike steel, all rubber will contribute hysteresis and will detract from linear behavior.
Basis begins the process with proper care during shipping. You know what would happen to your Basis turntable if its package got dropped 10? Nothing! Each Basis is shipped in cartons designed to survive that drop. That's one of the reasons Basis has never lost a product due to shipping damage.

The Basis arrives in two shipping cartons. In the first is found the base with its four suspension towers, the motor, and the subchassis. The other carton contains the platter, the four suspension cartridges, the armboard (pre-drilled to accept the tonearm specified by the customer), and a number of assorted small parts. Each component has its own snug cutout and comes wrapped in micro-foam, an extremely soft plastic.

Unwrapping the components is a thrilling experience. As the plastic wrapping is removed, the exquisitely finished surfaces of the black acrylic component parts—acrylic is the predominant material for everything except the black-anodized, brushed aluminum suspension towers—are revealed. The polish is the finest imaginable—to the point where I hesitated to touch anything for fear of marring the wonderful finish.

Two bolts at the bottom of the base release the subchassis from its shipping position. Next, one at a time, the four suspension cartridges are installed in each corner post (a tool is supplied), the platter is lowered in place over the spindle, the belt is positioned to join the motor pulley and platter, the bottom feet used for coarse leveling are screwed into place, and finally the caps for fine leveling are installed in the top of each tower. Plug in the power supply and the turntable is ready for a spin. It may seem like a lot to do, but it's not time-consuming.

I would even concede that mounting the tonearm is not a chore. The pre-drilled armboard takes care of that. But it is at this point that we get to observe A.J. at his designing best.

Watch closely: To mount the tonearm and armboard, all you do is align the armboard with its opening in the subchassis and gently lower the whole assembly into it. When the armboard hits bottom you have completed mounting the tonearm. No screws, no bolts, no nothing!

The bottom surface of the 8-lb armboard has three precisely drilled holes. When the armboard is lowered into the well, three correspondingly accurate pins fit into the armboard holes, aligning it precisely. Every bit of the accuracy is made possible by digital techniques. Since numerical-control machine operations are involved, all component parts are produced to the same exactness regardless of time of manufacture.

Just how accurate is this arrangement? The most you could be off, A.J. tells me, is 0.0005" when changing armboards. For me that's close enough—I can't imagine anyone doing better when mounting cartridges. I know no arrangement more convenient or more accurate. Simply put, the Debut is an ergonomic joy. It just doesn't get any better than this! It's simple to set up, unusually tolerant as far as placement is concerned, and keeping it in playing condition requires minimum attention.

Is that all there is?

If there's one aspect of the Basis that's bound to be noticed right away, it's the very substantial nature of this product. It looks sturdy, as if it could go on forever. Nothing is flimsy or, God forbid, shoddy.

The design exudes robust strength—in a turntable, I'll always take robust over flimsy. Everything is built up from the 1"-thick acrylic base, which acts as the foundation for the four suspension towers, the Papst DC Hall Effect motor, and a panel for the On/Off and 33½/selector switches. The base sits on four threaded feet intended for initial coarse leveling. An external power supply for energizing the motor plugs into the rear of the base.

At 3" in diameter and standing 5" above the base, the towers act as anchor points for the hydraulic suspension cartridges. With all four cartridges in place, the subchassis hangs suspended by the four hydraulically damped springs within the cartridges, providing a floating platform for the platter, its bearing, and the armboard.

3 What is accuracy? Is it a decimal point with many zeros before you come to an integer, as in 0.000000000? Or is it a lot of talk about ever-decreasing entities such as mils, microns, or angstroms? For my money, none of the above. Accuracy is something real, tangible, and accessible. Example: Mike Hobson of Hobson Ultimate Sound, a NYC high-end salon handling select esoteric products such as Avalon, Rowland, and Basis, calls and asks a favor. He'd like to borrow my SME V/Rowland Complete combo, which happens to adorn the Basis being reviewed. I tell him okay, and he comes and takes the goods. You know what accuracy is? When he calls me the next day he tells me the VTA was right on, and how good the cartridge performed without having to fuss over it in his Basis.

What's so wonderful about that? Only this: He removed an armboard with a cartridge from my Basis, took it to the Basis he had in the City, and played records without the need to adjust, trim, or tweak. Suffice it to say, the process was equally successful when he returned my equipment. All that with an armboard that has no hold-down bolts or screws.

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The total visual impact of the Basis turntable is very striking. The platter itself is the focal point. At 12" in diameter and a full 2" thick, it can’t help but attract attention. Several circular grooves cut in the vertical surface of the periphery add significantly to the overall finished look. Because the lines and proportions have been very tastefully executed, this turntable appears smaller than its 23” W by 16½” D footprint would suggest.

At the same time, nothing appears crowded. The amply sized armboard stakes out a fair-sized territory and creates plenty of operating room around the tonearm for convenient handling. A.J. stated to me that the Basis will accommodate any tonearm on the market. The other end of the subchassis is similarly open and balances the convenient appearance. All we find there is a triangular cover. It keeps the motor pulley and some of the drive belt hidden from view.

Now let me state that the weight of the platter and the armboard are 26 and 8 lbs respectively. Add to that 22 lbs for the 16" W by 22½" L by 2"-thick subchassis, and you get a total of 55 lbs of suspended mass. Total turntable weight is 85 lbs. As I said, very sturdy!

But there’s more to “sturdy” than meets the eye. As good as weight might be, dead weight is better. High homogeneous mass by itself will not prevent standing waves and other similar resonant disturbances from intruding and tainting playback efforts. To combat these influences, the damping properties of the acrylic for platter and armboard have been increased by including substantial quantities of lead inserts.

The platter, being the crucial component that it is, has been subjected to further refinements. Besides containing lead inserts to control resonances and maximize the moment of inertia to resist speed deviations, it undergoes a computerized high-speed balancing process. Of course, the bearing has been finessed for the best performance possible by matching each platter to its oil-well-type bearing. The bearing is designed to maximize the stability provisions of the platter by arranging to have the center of gravity of the platter below the upper bushing.

So far, so good. Rudimentary stuff up to now. Time to get esoteric—let’s talk platter runout. According to A.J.’s findings, here’s a parameter that plays a crucial role in a high-performance product like the Basis.

Runout essentially describes the rotational accuracy of the platter. But just what is rotational accuracy? How do you distinguish between a bump on the edge of the platter and wobble of the bearing? Let me tell you, when A.J. told me how and with what accuracy he measures runout, I stopped asking questions and listened.

To measure runout, A.J. clamps a jig to the bearing housing and positions a dial indicator on the periphery of the platter. A dial indicator is a very sensitive instrument used to measure increments as small as $\frac{1}{10000}$.

And just how “big” is $\frac{1}{10000}$? The diameter of a human hair measures $\frac{2}{10000}$!

Remember that and read this carefully: the total runout of the Basis Gold Standard Debut is $\pm\frac{1}{10000}$. In real-world terms, this means that, as it rotates, the periphery of the platter never wobbles, bumps or grinds by more than half the width of a hair. And let me remind you, the diameter of the platter is 12", or $\frac{12000}{10000}$.

In A.J.’s experience, minimizing runout to such vanishingly low levels produces sonic gains in the retrieval of detailing, space, and focus.

If you recall, the suspended mass of the Basis is 55 lbs. Starting out with such a high weight is a distinct advantage: a pound or two either way is a small proportion of the total, and the balance of the suspension is not changed markedly.

And I’m not just talking leveling. The key here, according to A.J., is to consistently control the suspended portion of the turntable. The complex dynamics during playback make it undesirable to introduce anything that will upset the balance of the playback components in all planes. It’s here the resonant frequencies of the suspension come in. If I remember correctly, once I brought up the subject, the proud A.J. could not stop talking about the inherently stable nature of his suspension.

And just what plague are we trying so carefully to avoid? Well, it’s the epidemic of record warps, tonearm mass/cartridge compliance and turntable suspension resonances, airborne vibrations, and footfalls.

Typically, warps fall into the 0.5Hz region while the cartridge compliance/tonearm mass resonances take place anywhere from 8 to 10Hz. Obviously A.J. has no direct control over the external environment, but he can influence how his turntable behaves once disturbances hit. As a result, he designed the suspension of

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the Basis to have a resonant frequency of 2.8Hz vertically and 3.1Hz horizontally. It's understood that these are in well-damped situations. But the surprise came when he specified a torsional resonance of 3.8Hz.

I say surprise because it is rare indeed that turntable behavior in the vertical plane is willingly discussed, and even less common for the horizontal plane. But torsion—never in my experience.

*Please note that the three frequencies involved here are not the same, and will therefore avoid the pitfall of sympathetic resonances.*

**The Basis Record Clamp**

The Basis clamp, precision-machined from aerospace-quality materials, and anodized to the same standard to ensure a long-lasting finish, consists of two stacked metal discs joined by a bearing. This allows the top to be rotated with respect to the bottom. The bottom portion is shaped like a very shallow cone with a base diameter of 3¾". The base of the cone has a lip near its periphery formed by an embedded wire, which presses against the outer portion of the LP label. The active part of the clamp is a large horizontal knob, 2¾" in diameter and ¾" thick. The total height of the clamping device is 1¾".

What sets his clamp apart is its effectiveness. Make sure it’s in its most CCW position, slip it over the turntable spindle, press down against the record, and give the knob a firm half-twist. Done!

How done? Just grasp the locked clamp firmly by its flat knob and, believe it or not, you should be able to lift the 28-lb platter right out of its bearing. I would not advise going that far, but I think you get my drift. Remember that line from *Crocodile Dundee*: “That’s not a knife—*this* is a knife”? Well, *this* is a clamp.

**Reference system**

Never let it be said that the Basis didn’t get a good going-over during this review. As some of you might recall, this turntable and I go way back. I used it for the cartridge survey in the summer of 1989. (See Vol.12 Nos.6 & 7).

To list all the components used since the beginning of this evaluation would simply be too lengthy. A description of the system as it exists now should suffice.

5 The Basis clamp also fits Goldmuns and SOTAs.

The Basis sits atop the original Lead Balloon turntable stand supported on a 16½" by 24" by 2" fiberboard platform. No special sonic advantages are implied; the only goal was to give the Basis secure placement. Three tonearms—the SME V, the Triplanar, and the Airtangent—and at least ten cartridges have been associated with the Basis. The Jeff Rowland Coherence One Mk.II and the Krell KPA and KBL served well as preamplifiers. For power amplifiers I used the Krell KSA-250 or the Classé DR-9 models. The Apogee Diva loudspeakers are working as well as ever, especially when the DAX crossover is present. Wherever I can I use the Music & Sound MAS Power-Master AC Power Cords. For now the DR-9s, the Coherence, the DAX, the Esoteric P-2 transport, and the Wadia processor are connected to AC power in this manner.

Cables continue to baffle me; I use a number of sources, depending almost on how much changing I feel like doing. At one time or another Monster Sigma, AudioQuest Lapis, Straight Wire Maestro, or the Krell Cogelec and Path could be found in the system. I must tell you that using DR-9s and Monster Sigma cables throughout produces an unusually effective combination, one I enjoy often. My preference is not to intermix brands; otherwise, confusion reigns.

**Testing, testing . . .**

During this review I got to know why some manufacturers are loath to leave a product with a reviewer—familiarity breeds contempt. Having heard so much propaganda about the suspension system of the Basis, I decided to carefully examine just how effective A.J.’s design really is. I put on a record, got out a mallet, and started banging away at the turntable’s base! Of course, this was a carefully controlled experiment: I protected the finish with tape and used a rubber mallet.

Based on experience with other turntables, I tapped lightly at first. Nothing. More force.

5 Since Ken Kessler is into scoops and tweaks, let me tell you that the two-part Kontak contact cleaner from Great Britain he wrote about recently does indeed do the many wonderful things he described. Ken gave me small quantities of this elixir at the 1990 SCES, and I can attest to its effectiveness. Be on the lookout for this product. Someone is sure to bring it into this country soon. In the meantime, it can be ordered from the Hi-Fi News & Record Review Accessories Club. Tel: 011-44-234 741152 (UK).

6 Lest you think I’ve suffered severe burnout, allow me to point out that this is exactly what A.J. does to demonstrate the effectiveness of his suspension.
Still nothing. Now I was literally delivering hits to the side of the base but had yet to hear a perceptible disturbance in the loudspeakers. At this point I stopped. What I was doing was ridiculous—nothing remotely resembling this will ever be encountered by any turntable.

Encouraged by those results, I moved on to the next level of stability—the subchassis itself. I proceeded to rap the edge of this part with the knuckle of my bent forefinger. More surprises. The music could not be disturbed until I got quite forceful. Now I could hear the effect of the knock over the din of the musical background. Vertical and horizontal rapping produced the same result.

Obviously a closer look was in order. Out came the oscilloscope (I keep it around to zero in on the azimuth alignment of cartridges.) Plugging it into the tape output of the preamp, I have the gain of the phono stage plus the gain of the 'scope working for me to magnify the motion of the stylus. Think of it as an electronic microscope, if you will. If the 'scope's gain is set so that the loudest musical passages, as heard in the speakers, fill up the 80mm-high 'scope screen, I have a relative link to actual playback conditions.

Again I banged away at the base with the platter, but couldn't budge the trace representing the music. Obviously the music was interfering with the test.

I shut the turntable off, removed the record, lowered the stylus onto the platter, and hit the base again. Aha! Now I see several low-amplitude, well-damped cycles of ringing, then nothing. The raps on the subchassis were similarly ignored. I was impressed.

After all, I was trying to dislodge an object weighing 55 lbs with the force behind my bent forefinger. How many airborne disturbances of that intensity will ever reach a turntable? The launch of the space shuttle? An earthquake? Similar conclusions can be drawn when comparing footfalls and platter strokes.

Don't for a moment think that this stability does not translate into better sound. That rock-solid sense that the Basis brought to the music—that's the mass and the suspension working for you. That's the result of the imperturbability that has been one of A J's design goals from day one.

**Sonic performance**

As you have seen, I have found the Basis turntable to be practically unassailable in the areas of engineering, ergonomics, aesthetics, and build quality. However, all the wonderful features and conveniences can lose much of their luster if the product does not distinguish itself sonically. Rest assured—the Basis does distinguish itself, and in a most exemplary manner. It's not a matter of like or dislike, or a little bit better here or there. This turntable is a prodigious performer; its sonic attributes are far and away the best in my experience.

What exactly do I mean by that? Well, for one thing, the Basis asserted itself in no time at all. A few bars into the first LP I played, even before all the tonearm settings had been completed, was all it took for me to realize that I was hearing significantly more information from a recording very familiar to me.7

Then, when all the cartridge adjustments were optimized, I was in a new world. If I ever wondered about the validity of our pursuits in terms of lost chords, my doubts were dispelled right there and then. It was not a matter of finding one or two of them—no, a great many of these chords could now be heard making their first appearances. And there was space. And textures. And much, much more.

Harmonic complexities resounded with energy and improved clarity. I couldn't help but admire the newfound power and dynamics, while at the same time gaining details, delicacy, and speed. It's as though the strings and drums got tightened, yet without a change of pitch, of course. When heard in combination with the much improved imaging and increased sound-space, a compellingly individualized presentation resulted.

The music simply took on a new dimension. The presentation was more wholesome and had a more credible air to it. I was pleased to discover a certain sense of taut control that was very reminiscent of the fervor of live music. Very much along the same lines, a rhythmic spontaneity materialized, contributing to keep the seemingly endless varieties of sonic artifacts organized. Timbres, details, and dynamics appeared palpably proportioned, allowing the cascading scales of the music to dominate the presentation. But best of all, the music was exciting and appeared to flow and ebb with

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7 If you want to see what progress you are making with your tweaking, especially over a long time period, play a recording familiar to you but one which has been dormant for at least a year or so. The progress of your efforts will be measured in how much more startling the newly revealed material is.

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enviable ease. In a word, it was significantly more effortless.

I was also impressed by a certain sense of rock-solid stability. The musicians seemed to play with greater certainty, with more involving rhythms, and with more distinct placements of the performers. Yes, more air surrounded the individual instruments, and more space filled the soundspace, producing a soundstage marvelously vivid and sonically satisfying.

Having said that, let me remind you that we have to imagine everything in terms of the capabilities of reproduced sound, and let live music remain the holy grail that it is.

As far as I'm concerned, as soon as any soundwaves hit the microphone diaphragm the signal is corrupted. It's that old story of the probe disturbing the experiment. I know no technique sophisticated enough to convert the delicate complexities of music into electrical equivalents without corrupting the signal. The atrocities committed by the rest of the record/playback chain put an end to any hopes of recreating the realism of a musical event. Without reinventing the process as a whole, like it or not, we are stuck with what we have—recordings.

And recorded music can have pinpoint imaging, artificial space and stage effects, room limitations, and other audible artifacts not observable in a concert hall. Whether the mikes sit high and far apart above the conductor or, God forbid, are set up in multi-miking arrays, try as we may, we won't do better than what the mikes "hear."

Live music should be used to guide us in evaluating timbres, harmonic richness, harmonies, dynamics, and rhythms. That is, of course, in addition to enjoying the music for its own sake.

While I heartily concede that recordings are the reason why our preoccupation with sonics brings us together, we should not forget that we are working with an inherently flawed medium, be it analog or digital. At the same time, I'm sure that the miracle that it works as well as it does. In that context, the Basis turntable has to be considered a miracle worker.

Before the Basis arrived, and despite the excellent reputation which preceded it and my expectations that it would help me with the cartridge reviews, I was skeptical about the impact the Basis would have. After all, I was on a high, having just succeeded at improving the VPI HW-19 Mk.III fairly substantially. By re-placing the four suspension springs for the HW-19 subchassis with four Navcom isolation pucks, I tightened up the suspension. This resulted in much-improved bass definition and extension, as well as more coherence and mid-range openness.

I was put in my place by those first few bars heard through the Basis. Right then and there I realized that I was dealing here with a breakthrough product. This was no tweak, refinement, or repackaging job. This was a redefinition of the LP playback process.

In no way is this intended as a slam of the HW-19. I have nothing but the highest regard for Harry Weisfeld's product. As a matter of fact, I would venture to say that Harry's HW-19, coupled with Bruce Thigpen's ET-2 tonearm, represents one of the best-ever values in the high end—the most sound for reasonable bucks, without a doubt. But for the HW-19, Navcom pucks and all, to keep up with the Basis is not in the cards. Nor was it intended to be, as the TNT testifies.

In all respects but one, the Basis is far and away the more desirable product. The Basis is a no-holds-barred design and should therefore be compared with the Goldmund Reference and the Versa 2.0. That one respect is price. The Basis Gold Standard Debut lists at $6900, the HW-19 Mk.III at $1200. The Basis **better** be better. **Much** better.

Rest assured that it is. As far as I'm concerned, this review could read: Buy it, you'll love it. But the shock of such a short review from AB might be too much for JA.

I cannot pay it a higher compliment than to say that the Basis is essentially without a sonic signature. How do I come to that far-reaching conclusion? As imperfect as the whole recording/playback process is, how is it possible to ascribe neutrality to any one component in the chain, and for something as difficult to pin down as a turntable, no less? All I can tell you is that long-term listening and a wide variety of associated components are my basis for coming to that conclusion.

Over the past year I have used the Basis with three tonearms: the Triplanar, the SME V, and

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8 Although this procedure has been tried by others with equal success, and has been written up accordingly, this is not a mood for all seasons. Make sure the turntable is securely supported, or is placed on a dedicated turntable stand, to minimize external disturbances. Navcom will work to advantage under the right circumstances, but it's no cure-all. And just so you know I tried it, when I used the pucks to bypass the suspension of the Basis, the results were disastrous.
the Airtangent (with the Jeff Rowland Complement arm to follow soon). At various times at least ten different cartridges have been fitted to these tonearms. It is therefore not some synergistic combination that allows this turntable to shine. What actually happened was the opposite. Every time a component was used in conjunction with the Basis, it performed better by a significant degree. That goes for cartridges and tonearms alike.

I have never heard the individuality of each cartridge or the contribution of each tonearm revealed in such stark terms. Each transducer’s individuality stood out clearly, making it easy to assign identities.

Whatever the coloration, it seemed to be closely associated with the components that came and went, while the contribution of the turntable proper remained but a small proportion of the overall contribution.

I am somewhat disappointed that JGH’s review of the Versa 2.0 turntable/tonearm playback system9 appeared in these pages before this. Many of the observations JGH made with respect to the Versa have a very familiar ring.

Had I described what I heard without being aware of his experiences, I could have conceivably been accused of plagiarism—my sonic impressions of the Basis are that similar to his observations about the Versa. The rock-solid stability, improvements in image specificity, and standard-setting bass performance are areas where I agree with Gordon, except that we are talking about different products.

While he was left wondering whether the improvements he heard were due to the turntable or the tonearm portion of the Versa 2.0, I know that the turntable is the, ah, basis for all the improvements I noticed.

I don’t want for a moment to infer that a sonic comparison with the Versa 2.0 is intended. It is not. Having had the pleasure of using and listening to this wonderful product at Definitive Hi-Fi and at the home of Hy Kachalsky, the president of the Audiophile Society, I could attempt to interpolate. I will not.10 Although Hy’s system is very similar to my reference components, our listening rooms are totally dissimilar. In addition, the cartridges in both cases were unfamiliar to me. Until I can listen to both products under the same conditions, I am not prepared to discuss the sonic capabilities of the Versa in relation to the Basis.

All I can tell you now is that both are remarkable performers and I hope someday to be in a position to contribute to this point of interest.

Conclusion

At this point, you know what’s coming: I just love the Basis Debut Gold Standard turntable! It is simply one of the most resoundingly remarkable high-end products that it has been my pleasure to enjoy. It boasts stunning looks, exquisite execution, and superb performance. As far as I’m concerned, this is one product that should bring joy regardless of considerations.

I believe the Basis to be a landmark design. While the Linn LP-12 was instrumental in getting everybody to pay attention to turntables, today it appears quite primitive, certainly next to the Basis. To be sure, the differences in appearance are startling, but they were never intended to compete in that area. But my point has to do with evolution and bringing to a finish what was started. The Basis does that. It is tweak-free, versatile, and simple.

Tweak-free means that there is no magic way to tighten the tonearm cable clamp, no trick to getting the springs adjusted, no mystery to the composition of the armboard material, and no adjustments for the motor pulley. The belt of the Basis rode on the crown of the motor pulley from day one. Place the Basis on any reasonably level and secure surface—remember, it weighs a good 90 lbs—level it with the very accessible knobs at the tops of the suspension towers, and enjoy your LPs.

The versatility of the Basis is unsurpassed. While the Goldmund Reference may impress with its finely tuned bulk and fancy electronics, and the Versa 2.0 with its exquisite execution of a complex mechanism, it cannot be denied that these are inflexible designs. Of course, both companies will tell you that these no-holds-barred designs have been optimized to work with the provided tonearms. But a turntable that can accept any tonearm in the industry without fuss has its advantages. Separate tonearms have more user-friendly features. For example, a more flexible setup for comparing cartridges than the Airtangent tonearm cannot be found. For that reason, any dedicated high-end dealer should have this tonearm to service their customers better11 by allowing accurate comparisons between cartridges.

The Basis is a completed design. Everything

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9 Vol.10 No.8, Vol.11 No.1
10 After all, this is analog; there’s no need to interpolate.
appears to have been reduced to the simplest form. The aesthetic appeal, the features and ergonomics, the performance and reliability, have all been dealt with with extreme success.

11 I can't but digress and mention that the Airtangent tonearm is one of my all-time favorite pieces of equipment. I wouldn't be without it, so I own one. Leif Haggmark, the designer and manufacturer in Sweden, has been kind enough to supply several additional air-bearing arm assemblies. You can read how I feel about this product in the February 1989 issue. Furthermore, I can categorically say that I would not undertake multiple cartridge reviews without this tonearm. Its unprecedented flexibility comes to the rescue and allows me to evaluate cartridges with great precision and repeatability.

This is a product bound to perform flawlessly—and, more significantly, satisfy—for many years to come.

The Basis Debut Gold Standard turntable has my heartfelt recommendation. I can't recall another instance where fit, finish, and function are more effectively combined. Nor can I think of another product that I could put up for your consideration with more confidence. This turntable has "classic" written all over it. It goes without saying that the Basis is a natural for a Class A recommendation.

**A PAIR OF CONNIE J'S**

Martin Colloms reviews the Conrad-Johnson PF-1 preamplifier & MF-200 power amplifier

Conrad-Johnson PF-1 FET preamplifier: Input impedance: 47k ohms in parallel with 260pF (phono); 31k ohms in parallel with 100pF (line). Input sensitivity (for 500mV output): 0.48mV (phono); 50mV (line). Overall gain: 60dB (phono); 20dB, phase-inverting (line). Output impedance: 160 ohms. Dimensions: 19" W by 3.5" H by 13.2" D. Serial number of unit tested: 300100J. Approximate number of dealers: 100. Price: $1295. Manufacturer: Conrad-Johnson Design, 2800R Dorr Avenue, Fairfax, VA 22031. Tel: (703) 698-8581.

Cycles can be seen in the fortunes of companies. Likewise cycles can be seen in the performance of companies’ products. A particular range will appear to have got it just right, whatever “it” is. The designer may have hit a winning streak and thus steal a lead over the competition. C-J set a new state-of-the-art preamp standard in the late ’80s with their Premier Seven, and some of that expertise and experience are beginning to pay off in the shape of new high-performance preamplifiers at realistic prices. Moreover, the pressure was on to develop better power amplifiers to match. Two important products have emerged from all this in C-J’s moderately priced FET range, namely the PF-1 preamp and the matching MF-200 power amp. By audophile standards, these are moderately priced at $1295 and $1995, respectively.

What do you get for your money? Well, the MF-200 is quite substantial at a solid, continuous 200Wpc, both channel driven, with sufficient current reserves to drive a wide range of loudspeaker loadings. The one-box PF-1 has disc and line inputs, the latter rather sensitive for CD use, and while the disc input is rated as universal, there may be questions about its compatibility with some cartridges on grounds of input noise and input overload margin. On the face of it, the PF-1 does have sufficient gain for the direct connection of a moving-coil cartridge.

The PF-1 is of 19” rack width but is quite compact at 3.5” high. Finished in a pale-gold brushed alloy, the front panel is well-laid-out, with clear, unambiguous legends. From the left we have the input selector with a choice from phono, tuner, CD, and tapes 1 and 2. The source/tape monitor follows, then the mode switch, stereo/mono, etc. Add the stepped balance control, and the lineup is completed by the standard volume control. On the back, the mains cable is captive while the sockets are unbalanced phonos.

The power amplifier is a large item, weighing almost 60 lbs. Fitted with rack handles, the panel is finished in matching satin gold alloy, neatly lettered and fitted with one control: on/off. Again, the rear panel sports a captive mains lead; inputs are gold-plated phono, the outputs heavy-duty, gold-plated 5-way binding posts. Finned heatsinks are conveniently located at the back of the unit. It does not run too hot in normal use.

Technology
Both these units are based on FET circuits, their low-feedback designs intended to capture some of the character of tube technology. Taking the PF-1 first, one striking aspect is the complete absence of electrolytic capacitors, either in the signal circuits or in the power supplies. This is in accordance with C-J’s whole-hearted belief in the superiority of plastic film capacitors in all applications. The power supply begins with a primary regulator feeding three secondary regulators, one for each gain-stage block. Described as a zero-feedback design, this gain-stage block employs distortion-canceling techniques to help achieve satisfactory linearity. Operating as a low-impedance buffer with a gain of 20dB, it is used in both the line amplifier and the output stage of the disc amplifier. Between the first disc stage and the latter comes the passive phono-equalization network. The phono input uses a J-FET in a single-ended configuration, and is non-inverting overall. All capacitors are polystyrene or polypropylene film; with the single-rail circuits used, capacitors are necessary to couple the stages.

The MF-200’s input is straightforward, comprising a differential J-FET pair buffered by an emitter follower. A voltage amplifier with current-source load leads to a complementary MOSFET driver. Three pairs of high-current MOSFETs make up the output stage. All sections prior to the final output are fed from regulated DC so that pure clipping is defined by the driver and not by the output. Faster recovery should result. Though the MF-200 is a feedback design, it is stated to use “uncommonly low feedback.” Generously sized electrolytic reservoir capacitors are present in the shared power supply, while the critical large-value feedback decoupling component is a film type. No “electronic” protection is present; the unit relies on the natural robustness of the output devices, and on 5A voltage rail fuses.

Sound: PF-1
First trials suggested something special from these products; accordingly, I gave them a generous level of care and attention during auditioning, including the use of worthy ancillary equipment.

I began listening through the PF-1’s phono input after suitable conditioning and adequate warmup. Within a context of some absolute

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Throughout, Stereophile, consistently, levels detail I expected. Without fail, the PF-1 was not as neutral and as uncolored as the finest, nor did it display the same level of focus, precision, and stability. However, it did offer a sound quality in one way that was right up with the very best, and which was promised by the zero voltage feedback circuitry. That quality is a sense of liveliness, presence, transient believability, and dynamic excitement—something that great audio is all about. As a rock fan would put it, the PF-1 sounds upbeat, with a great presentation of pace and rhythm. In fact, the more I became aware of this aspect of its reproduction, the more I saw it as a fundamental and necessary requirement. Returning to most other preamps gave the impression that they are slow and drowsy, diluting dynamic contrasts and returning a downbeat impression of rhythm. Make no mistake, the PF-1's phono stage is something of a reference in this area, and could easily be bought for this alone.

Readers may recall several reviewers' similar reactions in the mid '80s to the Counterpoint SA7, a low-budget, zero-feedback tube design. I also recall remarking, when hearing the excellent bass performance of the Krell '7B, that once you've lived with that kind of bass it's hard to give it up. This remark is equally true for the high level of pace and dynamics delivered by the PF-1. Such high performance is unexpected at this modest price level, and the overall performance is, in any case, difficult to fault; it does not let the side down.

Another strong quality of the PF-1's phono input was its ability to maintain high levels of detail regardless of the music's complexity. It consistently proved adept at revealing inner levels of orchestration with the full weight required for good counterpoint, and giving the feeling of many players working in concert on large orchestral pieces. Conversely, the sound was not excessively analytical in the sense that the performance was being unduly dissected. Throughout, I was aware of a unifying coherence to the presentation of all kinds of program.

The PF-1's phono stage was "bouncy" and lively in the bass, tuneful and agile, if lacking the full weight, slam, and authority of the finest references. What also mattered was the evident ability of the PF-1's bass lines to keep excellent pace with the mid and treble. For want of a better comparison, the bass was more like that of a Roksan than a SOTA.

The midrange was fascinating, as with its fairly close approach to neutrality there was also a hint of leanness and crispness, sufficient to align analog disc sound a little closer to the accepted sound of CD.

Dynamics were first-rate, the human voice sounding naturally expressive and allied to a strongly communicative import. "Hardness" in the accepted sense was absent—instead, singing voices sounded surprisingly real.

The treble sounded pure, with only the mildest loss of detail and transparency. Nonetheless, a good feeling of recorded atmosphere and air was presented in the treble, which also showed excellently controlled vocal sibilance and negligible grain or "edge."

Stereo images were presented with very good focus, good width, and fine depth. Recorded ambience was recovered well, and the general level of transparency approached audiophile levels. Well-worn LPs showed new levels of energy and detail, making the assessment of the PF-1 a continued pleasure.

If you think this all sounds too good to be true, you're right. Perversely, this C-J preamp did not maintain this exceptional standard when fed a CD diet (polarity-inverted, of course!). The presence of some moderate coloration gave a "harder," "darkened" sound; CD sources were not felt to be as well-balanced as the analog disc performance might lead you to suspect. It was as if a similar tonal flaw was present in both the PF-1 and CD, and was additive, whereas the analog source and RIAA equalizer lacked that flow, avoiding their sum rising above an audible threshold.

On CD, the PF-1 was a touch lightweight; comparison with a passive-controller connection showed this well. Nevertheless, much of the fundamental quality described earlier remained; if not, this assessment would be nonsense, as the analog disc signal did successfully pass through this very high line stage.

In absolute terms there was a loss of stereo focus and width, though what remained was still impressive, well beyond its price class. The sense of scale and of natural expressive dynamics was retained, and low-frequency
sounds were lively and rhythmic, involving and interesting. Transparency was very good, sufficient for a strong impression of stereo depth and for the recovery of ample ambience and recorded acoustic.

Only the finest CD sources would begin to tax this line stage.

When the PF-1 was teamed with the MF-200, there was a clearly audible affinity—a level of compatibility where much of the PF-1's virtue was communicated to the speaker load. While the MF-200 was not so obviously an exceptional performer, the two products partnered each other well, making it hard to argue with the overall result, notwithstanding the PF-1's ability to reach even higher.

**Sound: MF-200**

In the context of raw power delivery, I found the MF-200 to be load-tolerant, handling the range of test speakers well. Neither the Quad Electrostatic nor the Duetté Signature caused it any bother (as the lab results will later confirm). It is a genuinely powerful amplifier, as big as anyone is ever likely to require.

First impressions were of an amplifier sounding less "solid-state" than expected. Certain aspects caught the ear; for example, the natural texture and tonality of the broad midrange, such that one could use the term "creamy." Sounds in this fundamental range—human voice, cello, etc.—were well-balanced and believable. This region was backed by a powerful bass, with close to perfect damping which proved capable of a fine level of slam and yet was sufficiently agile to show a good sense of rhythm and timing. Here the MF-200 also reached significantly above its price class.

At cruising levels, the MF-200 possessed a good upper range; it mildly sharpened orchestral string tone and suffered from a shade of thinness through the treble register. Treble sounds were low in grain or other distortion effects, while vocal sibilance was quite natural; the high-frequency range conveyed a good measure of life, air, and sparkle. Some of the competition sounded deadened and closed-in by comparison.

Stereo focus and stage width were up to the expected standard, though some image narrowing was noted toward the back of the stage illusion. While generally revealing of musical detail, there was also a window of extra transparency in the midrange which could often give an insight into the more subtle spatial properties of top-class program.

The preceding paragraphs apply to moderate domestic sound levels with medium-sensitivity speakers. When the MF-200 was driven into the upper "loud" part of its working range—where average power exceeds 1 or 2W and the peaks are 10--20dB louder (20-200W and close to clipping)—it revealed a less favorable nature. The amplifier changed gear, as if readying itself for a long climb, and sounded coarser as well as harder, with increased glare and a significant drop in clarity.

In this condition the performance fell back to the merely "normal" for its price group. This aspect presented a difficult prospect for the reviewer—how to judge a product with this kind of two-level performance? For this, you'll have to wait for (or turn to) the conclusion.

**PF-1: Lab Report**

The PF-1 is ostensibly a moving-magnet design with a confirmed 47k ohm, 260pF input impedance. Normally an input sensitivity of 1 or 2mV is available for an IHF standard output of 0.5V for such an input; the PF-1 delivered a 0.48mV sensitivity and an overall gain of 60dB. This was just sufficient for the loudest "low-output" moving-coils, and was well-suited to the "high-output" types which generally offer somewhat lower levels than the average moving-magnet. Further consideration of the disc input is worthwhile to help understand the optimum matching conditions and to extract the best performance from the unit. Here we must also consider the input noise and input overload margins. Viewed as a conventional MM input, the overload headroom was marginal, to say the least. Though the figures of 16.6dB at 20Hz and 18.3dB at 1kHz are satisfactory, only 4dB is available at 20kHz. This means that referred to the standard maximum recorded level of 50mV at 20kHz (70mV peak), the PF-1 will only accept 111mV peak before its distortion reaches 1%. However, 40cm/s peak levels are possible from disc which could result in momentary peaks of 200mV from a high-output moving-magnet cartridge or a moving-coil, when used with a step-up unit of healthy matching ratio. This explains why the disc intermodulation graph (fig.1) showed a rather high level for the 1kHz difference tone; this product was just 20dB down at the MM test level, corresponding to a full 10% distortion.

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When the input signal was reduced by 20dB, corresponding to a moving-coil drive, the distortion was then reduced by nearly 20dB, resulting in a satisfactory -39dB intermodulation figure. In the PF-1's favor was the "linear" character of its high-frequency overload and/or distortion; this should not be compared with a more audibly serious kind of feedback clipping overload, which produces severe "rattling" effects. At MC input levels, the other overload results correspondingly improved, there being now 36.6dB headroom at 20Hz, 38.3dB headroom at 1kHz, and 24dB at 20kHz.

On a moving-magnet basis, the disc input noise was fine at -71dB, CCIR. However, this translates to only 51dB for a 0.5mV or MC input reference, which implied an audible hiss a little louder than average disc surface noise when using moving-coil cartridges of the Linn Troika rated output level; for example, 0.2mV for 5cm/s recorded velocity at 1kHz. Moving-coil cartridges giving an output of 0.5mV to 2mV for 5cm/s are most suitable. Additional input loadings may be applied if space is available in the phono plug, or better still, on the input terminal inside the preamp, installed by a good technician. 1k ohm metal film or a preferred foil type and a 1nF polystyrene in parallel are a good all-around loadings for MC cartridges.

The line input shows negligible distortion, that present of low harmonic order measuring typically -70dB or 0.032%. A fine -80dB 0.01% reading was obtained for high-frequency intermodulation (fig.2). Line-input noise was judged satisfactory at -80dB (CCIR-weighted) for a 0.5V input and 0.5V out. The "X"-weighted figure was -84dB, which corresponds quite well to the manufacturer's claim of 94dB unweighted, referred to a 2.5V output (this level 14dB above the 0.5V IHF level). These results are no more than satisfactory, except where high-sensitivity power amplifiers and/or speakers might be used, these imposing unusual demands with regard to very low system noise levels. With the volume control at zero, the unweighted output noise was -83dB ref. 0.5V or -97dB for full amplifier power (eg, MF-200). However, better than 105dB is needed to ensure a complete absence of audible noise with a high-sensitivity horn-type speaker.

Covering some basics, the disc section through to the tape output was absolute phase/polarity-correct. Channel balance was fine at 0.5dB or less error, while the channel
down by 20Hz and within 0.4dB at 10Hz (fig.3). The ultrasonic rolloff above 30kHz was welcome, while it should be noted that there was no infrasonic filtering; thus the matching turntable should have low rumble and a correctly matched/damped tonearm-cartridge combination.

A check on the line input showed a very extended low-frequency response (fig.4), perfectly flat to 19kHz −0.5dB, −3dB at 29kHz. Even for a tight 0.5dB tolerance, the low-frequency response extended below 1Hz. It was confirmed that the line stage was phase-inverting, however. A maximum output of 8.2V (100k load) was available for a low source impedance of 160 ohms, ample for any application. A gain of 20dB was delivered, rather high for CD, which needs typically 10dB. Conversely, some tuner and tape sources required the extra boost. (A series resistor of 100k ohms could be used for CD.) The channel matching for the volume control was excellent, never exceeding 0.06dB error over a control range of 60dB. Interestingly, the line input impedance was a bit lower than expected, measuring 31k ohms with a moderate 100pF of parallel capacitance. No DC offsets were present at the outputs.

**MF-200: Lab Report**

Rated at 200W into 8 ohms, this is a power level of 23dBW referred to 0dB, 1W, 8 ohms. The MF-200 raised a solid 250W (24dBW) with an exceptionally good power bandwidth. No diminution was recorded at 20Hz, while at 20kHz the power loss was barely 0.1dB. Protected by modest supply-rail fuses of 5A, the extra current demanded at 20kHz into 4 ohms blew the fuse, while the results for 20Hz and 1kHz were 22.7dBW at this lower impedance, representing a true power of 373Wpc. This arduous test was made with both channels driven. In view of the fine result at 20Hz, the power-supply reservoir capacity was clearly quite generous.

On peak signals the 8 ohm power rose to 263W or 24.2dBW; these fine results were available regardless of the more demanding nature of the 50Hz supply used in the UK. One could not fault the '200 for load tolerance; it managed a peak level of 23dBW into 2 ohms, a true power of 800W. Backing this was the moderate output impedance of 0.15 ohms (rising to 0.25 ohms at 20kHz) and the peak current capacity of ±28.5A, hardly what one might expect from a low-feedback FET design.

Some evidence of the latter was forthcoming in the results for distortion, however, which were rather higher than those found in most high-end, solid-state power amplifiers. At rated power the distortion readings were satisfactory at −53 or −54dB, or 0.22%. Surprisingly, the results were very similar over the whole frequency range, and even for the two-tone (19:20kHz, 1:1) high-frequency intermodulation, where the 1kHz product measured at −53dB. Examination of the distortion spectra showed a fair balance of even and odd harmonics decaying with increasing frequency—a tube-like character. At 1W, the distortion had improved by a factor of 10, or 20dB, roughly in proportion to the reduction in power level. Excepting a reading of −65dB or 0.56% at 20kHz, all distortion readings were fine at typically −70dB, or 0.02%.

I felt some further exploration was in order in the light of the dual nature of this amplifier's sound quality when judged at low and high power levels. Fig.5 shows four traces, the lower pair relating to the right-hand scale and plotting input level in dBV vs watts, for 4 ohm and 8 ohm loads. These reveal good power linearity to beyond 200W (this would be a straight line for a log scale in watts). More relevant are the upper two curves, which show distortion vs level again for 4 and 8 ohm loads. Between −10 and −5dBV, corresponding to an indicated power level of a few watts, there was a distinct change in this amplifier's linearity, exaggerated in the poorer upper curve, which is the result with the MF-200 loaded with 4 ohms. The other slope features were easily explained; for example, the rise at very low levels is simply due to residual system noise, while the abrupt slope change at 6dBV input denotes the onset of clipping. The −5dBV point, approximately 20dB below full power, marks a transition between two regimes, modified by loading and hence, for example, by impedance variations with frequency in a loudspeaker crossover.

Another useful test can reveal interference between power-supply components and the audio output, the so-called "supply modulation." Here the amplifier is stressed by the application of a 4-ohm load at two-thirds the rated 8-ohm output level, so as to draw substantial current. The input frequency is deliberately offset to 35Hz to allow visual separation.
of the 50Hz (UK) supply harmonics. Fig.7 shows this result where the natural harmonics of the 35Hz fundamental appear in progressively decaying order. A trace of 50Hz can be seen at 77dB down, but note that no higher supply harmonics—100, 150, 200, and 250Hz—are present even at the sensitive −95dB threshold seen for this measurement. No sidebands are evident either; I consider this a good result.

I investigated the transient and stability performance, rating the amplifier as unconditionally stable, with an obvious suitability for electrostatic speakers. The 1kHz squarewave performance (Fig.8) for a difficult load—8 ohms in parallel with 2μF—shows that a fast risetime was maintained with strong damping of the usual resultant ringing. This graph also reveals the amplifier’s excellent low-frequency response by the excellently flat tops. The amplifier was absolute phase-correct, DC coupled at the output, and of wide response, +0, −0.5dB 3.1Hz to 32kHz; +0, −3dB 1.25kHz to 156kHz.

Channel separation was ample, typically 80dB, falling to 59dB by 20kHz. Balance held to 0.13dB tolerance, and the S/N ratio figures were satisfactory—108dB ref. full power, 22Hz–22kHz—with a very low hum content. The power transformer was also mechanically quiet; some hiss might just be audible on very sensitive speakers of over 93dB/W sensitivity.

The input loading was modest at 50k ohms, while a 2.3V input was required for full level—too low a sensitivity for direct connection of a passive line controller, even with CD players of 2V maximum output. A 0.7V sensitivity is ideally required for such applications. DC offset measured at the output was fine at less than 12mV, and showed negligible drift. Mild “cross-over” distortion was evident at medium levels, but was of a beneficially low harmonic order thanks to the low-feedback design.

Taken overall, the test results were very good, particularly the high power available and the good load tolerance. A question remains concerning the “two-speed” nature of the tonal quality and its possible associations with the slope change in distortion at moderate output levels.

Conclusions
The conclusions are complex, dictated by the unusual nature of these two products. The designer’s goal of natural, musical dynamics has necessitated a level of individuality and distinction which makes these products less universal and easy to use than much of the competition.

One leading question concerns their mutual compatibility, since they are intended to partner one another. The answer is yes, they do match in character, style, and price, and are eminently recommendable as a combination, but please note the following caveat for the power amplifier. I advise an audition; you should take the opportunity to exercise the MF-200 over a wide range of levels to satisfy yourself as to its overall capability. Despite this cautionary
note, I still find that I can recommend the MF-200, not the least for its well-above-average sense of pace, life, and dynamics. In absolute power terms, it is also good value at a generous 200Wpc for $1995.

The fun really starts with the PF-1, which I'm sure has surprised C-J as much as it did me. Sure, it isn't perfect. Care needs to be taken with the phono input matching, and it's advisable to use a sweeter, more musical CD source, like a Meridian Bitstream (or even C-J's own). When all was said and done, however, it was the dynamic, rhythmic quality of analog disc performance that I especially remembered, and which took the PF-1 right into top audiophile territory. Its performance on other subjective grounds was sufficiently good so as not to prejudice this result; thus the PF-1 must be rated as an amazing hit. Its musicality reached far beyond its modest $1295 price-tag, though your dealer will have to earn his sales commission in terms of advice to attain the optimum result. The lab results helped define the operating limits while also showing that the unit was fundamentally accurate, particularly in terms of its RIAA equalization. Low-powered, it may be left permanently warmed up, always ready for immediate use. This convenience is complemented by the compact, well-screened, one-box construction—need I say more?

BITWISE MUSIK SYSTEM ONE
DIGITAL AUDIO PROCESSOR

Dick Olsher


Folks, the digital processor sweepstakes are heating up. New entries are beginning to crowd the market place. This is a perfectly natural development and a strong indicator that the promise of the compact disc has yet to be fulfilled. New life is being injected into many older players by massaging the digital bitstream through a digital processor. The idea is to substitute superior digital signal processing, filtering, D/A conversion, and analog processing for the guts of the old player. The "dinosaur" of the '80s can thus be transformed into a turbocharged mean machine for the '90s.

The naÃ¯ve belief that improved digital circuitry makes little audible difference has slowly faded as hardware has continually improved.
And it has become clear that producing audiophile-caliber CD sound is just as elusive a proposition as it had been all along in the analog domain. The advent of CD rings, surface treatments, edge coatings, higher-resolution DACs, cryogenically cooled CDs, low-jitter transports, and so on ad nauseam, highlights the fact that there's still plenty of art left in CD-player design.

It is, therefore, noteworthy to point out that the design team of the Musik System processor represents a conjunction of digital circuit-design expertise on the one hand, and audiophile savvy on the other. As the name of the unit suggests, the Musik System One is an instance of technology in the service of music. The design team of Bjorn Bjere, Erik Odeen, and Sean Yang is distinguished in several ways. All three are dedicated audiophiles intent on recreating the illusion of live music in the home. Two of the three (Bjorn and Erik), who happen to be expatriate Swedes, possess considerable experience in the design of digital circuits. It is not surprising, therefore, that the product has been gestating for a couple of years and has undergone refinement on the basis of listening tests. This is as it should be — an audiophile's ear should be the final arbiter of sound quality.

Technical details
According to Bjorn Bjere, the design philosophy behind the Musik System One concentrates on two criteria. First, the analog output is isolated from digital noise contamination because "even small amounts of digital noise may generate audible components." What is digital noise? One possibility is timing jitter in the data stream entering the DAC. The jitter will then modulate the output signal in a manner conceptually similar to a turntable's speed instability: the jitter signal operating on the digital datastream manifests itself as spectral sidebands around every fundamental in the ultimate reconstructed analog signal. Another possibility is RF noise from the master clock oscillator, which operates nominally at a frequency of 3MHz, or from the digital bitstream, which then contaminates and intermodulates the analog output from the DAC.

The resultant distortion products are not harmonically related to the music and thus are not consonant with the music, or euphonic, as are even-order harmonics. It has been argued that non-harmonic distortion is also more audible because it is amusical and is thus less effectively masked by the music than is harmonic distortion. Digitally generated grundge literally has no place to hide.

Timing jitter can be reduced significantly, though not entirely eliminated, by re-clocking the digital bitstream. This is done in the Musik System by a phase-locked loop which also provides the clock for the DACs. Additional isolation from RF noise is obtained by using a two-module chassis design. The digital processor module contains the circuitry for receiving and re-clocking the digital data and for increasing the sampling rate by a factor of eight. It also contains the power transformers and separate analog voltage supplies. There are a pair of inputs on the back panel of the digital module which are selectable from the front panel. The front panel also features a polarity or absolute-phase reversal switch that operates in the digital domain. The digital inputs accept not only standard CD format data, but also DAT format and satellite digital audio. This bit of flexibility may prove useful in the future as DAT units begin to proliferate.

Bitwise is skeptical of extensive adaptive digital processing, à la Wadia and Theta Digital. That type of data smoothing is absent in the Musik System One because, according to Bitwise, once you take care of the basics, it is neither needed nor desirable.

The digital module is connected to the analog module via two cables. A computer ribbon cable carries the digital data and voltage supply to the DACs while the analog voltage supplies and grounds are carried by the other cable. Here's where the second design criterion for the Musik System One comes in: the analog circuitry must be of audiophile quality. The DACs are 18-bit Burr Brown chips. The analog power supplies are heavily regulated. Separate printed circuit boards are used for each channel. The power supplies are heavily regulated. Passive RC circuits are used for the final analog filtering and de-emphasis circuit. Parts quality is high throughout. An active analog gain stage or a volume pot are not provided, so that the Musik System will have to be used together with a line-level preamp.

The sample that I evaluated was pre-production. I'm told, however, that except for minor cosmetic changes, production units will be identical. An even earlier sample did not
have a “keyed” ribbon cable, which made it difficult to properly connect the two modules. This was corrected in the second sample.

Preliminaries
After a 24-hour warmup, I undertook an exploratory listening session. A considerable warmup proved essential in smoothing out the upper-octave response; I therefore recommend that you simply leave the unit powered on at all times. There is no power On/Off switch anyway, so the intent is apparently to let the unit cook while not in use.

The objectives of this session were to investigate the specific needs of the Musik System One in terms of line-level preamps, CD-player transports, and interconnect cable. I tried both the Threshold FET-10/e and Cary CAD-5500 CD analog processor, and the Luxman D-1050 and Sony CDP-705ESD CD players used as transports. Several first but obvious impressions were fairly quickly established. Unlike the Theta DS Pro, which I used as a reference throughout, the Musik System One did not mind being fed into the Threshold preamp. The treble of the Theta/Threshold combination was pretty edgy. With the Musik System One, the highs were much better behaved. The mids were liquid in texture, and the overall delivery was fluent and effortless.

The Luxman transport proved a better match than the Sony. With the latter, the sound became less tubey! There was more detail to be had, but image size was reduced, the mids were less liquid, and the highs a bit harder. Bruch’s KoNidrei (cbs 6060, Collected Works for Cello and Orchestra), which ordinarily presents a breathtaking and dramatic soundstage full of dynamic bloom and harmonic richness, was emaciated by the Sony. The sound became pinched and restrained. Harmonic textures were lean, sounding far less robust. The size of the cello was diminished by being squeezed into a tighter space within the soundstage.

The cable used as a digital link between the player and the processor proved to make a huge difference with the Musik System One. The Kimber KCAG just did not work well in this context. The Kimber strangled the mids, and the sound in general became harder and darker. It turned out that nothing worked as well as the Lindsay-Geyer interconnect. The Cardas HexLink proved to be less dimensional and less vivid through the midrange. Both its focus and spatial resolution were inferior to the Lindsay-Geyer. Overall, the Cardas got me far less involved in the music. The folks at Bitwise acknowledge the crucial sonic role cables play. As a matter of fact, they’ve been experimenting with a variety of cables and have found AudioQuest Z to work very well. I tried a sample of AudioQuest Z and found it to be second only to the Lindsay-Geyer, mainly because of losses in the areas of image palpability and focus.

Bjorn Bjerede mentioned that the AudioQuest cable was found to sound better when connected with a particular directionality—with the double-banded RCA plug at the source end. This sounded intriguing, so naturally I had to try it. Amazingly enough, there was a noticeable directionality effect. For example, take a good listen to the Lesley Test, track 13 of the Stereophile Test CD. Try to visualize Lesley’s spatial outlines as you reverse cable directions. In the preferred direction, Lesley’s image outline is much tighter and more rounded or palpable in extent. At first I was quite surprised by all this. But then it dawned on me that the analog logic signal representing the digital bitstream is not symmetrical in shape with reference to the voltage baseline. Therefore, it is theoretically plausible for an unbalanced interconnect, especially one of coax geometry, to evince directionality. Next, I tried the same experiment with the Lindsay-Geyer. Again, I found a preferred direction which gave better image focus. This seemed to be the main effect of cable directionality. Image outlines became broader and less tightly defined spatially within the soundstage with a particular cable direction.

The main fare
Because the Musik System One worked so well with the Threshold FET-10/e, I decided to launch into a long listening session with that coupling before making any changes. It did not take me long to realize that I was enjoying myself, at which point I had to force myself into an analytical mode and try to home in on the MSO’s specific attributes. The most impressive of these was the ease with which the music ebbed and flowed. Most CD players imbue the music with an edgy or bright quality that detracts from long-term listenability. In contrast, the MSO’s relaxed manner invited me to just sit back and enjoy the show. An example of just how inviting it can be was gleaned from
Ariel Ramirez’s *Misa Criolla* (Philips 420 955-2): There was no treble edge or glare. Sibilants were well-controlled. Choral blasts were reproduced with full force without any evidence of compression. The soundstage was transparent and deep. Jennifer Warnes (track #6, Rob Wasserman’s *Duets*, MCA-D42131) sounds so good with lots of reverb. In fact, I’ve never heard her any other way. The breathy quality of her voice on this track, laden with artificial reverb, was clearly resolved with good control over her sibilants. The immediacy with which she occupies the soundstage was also well-reproduced.

Bypassing the Musik System One at this point by running the Luxman directly into the FET-10/e revealed just how much assistance the processor was giving an already expensive CD player. On its own, the Luxman was unable to fully resolve the layering of the reverb surrounding the vocal. Image outlines lost considerable degree of focus and the soundstage appeared fuzzier and more opaque. Basically, the presentation had lost immediacy and interest.

Moving on to another favorite vocalist of mine, Julianne Baird (*Greensleeves*, Dorian DOR 90126) shone with pure and liquid upper registers. There was plenty of hall information to immerse oneself in. The confines of the Troy Savings Bank Music Hall were clearly resolved, as was the lovely interplay between direct and reflected sound.

That same sense of refreshing harmonic liquidity was also evident on the Simax recording of Brahms sonatas for cello and piano with Mork and Lagerspets (Simax PSC 1029, available through Graham Engineering, Tel: (617) 270-0094). The Sonata in e, Op. 38, features a somber, introspective cello tone that came right through the Musik System One with tight bass lines. The passionate interplay between the cello and piano was readily accessible, as was the clear reproduction of the church acoustic. Another gem from Simax (PCS 1024) is the recording of Bach Sonatas for Viola da Gamba and Harpsichord with Laurence Dreyfus on gamba and Ketil Haug sand on harpsichord. A pair of B&K omnis were used for the harpsichord and a pair of Schoeps for the viola. Recording engineer Arne Alselberg must be a genius when it comes to mike placement, for despite the number of mikes and the disparity in pickup patterns, the soundstage is cohesive and deep, exuding believable and palpable image outlines. That wonderful and joyous harpsichord tone was allowed full freedom of expression by the Musik System One.

The next phase of the evaluation involved a direct comparison of the MSO with my reference—the Theta DS Pro. The Pro is quite a bit more musical than the already excellent Pro Basic that RH enthused over recently. Both Theta units share a startling transparency that allows you to see more clearly into the soundstage than any other processor I’ve heard. Couple that with an amazing familial ability to resolve low-level detail and preserve spatial detail, and you’ve got the best CD sound I’ve heard to date. The Pro Basic is more brash and electronic sounding than its more expensive brother, lacking the latter’s rounder and more liquid harmonic textures. This round of listening clearly defined for me the Musik System One’s strengths and limitations when pitted against some of the best money can buy.

With the Threshold FET-10/e, the Theta easily outdistanced the Musik System One in several key areas but failed to emerge a clear winner. Let me give a specific example. Monteverdi’s *Complete Seventh Book of Madrigals* performed by Ensemble “Concerto” on the small Italian label Tactus (TC 560310 3/4, 2 CDs; also available through Graham Engineering) is delightful in many ways. Foremost, the music is performed with great sensitivity. The voices of the ensemble, especially the sopranos, are just lovely. And the sound quality is excellent. The soundstage is wide and deep and is occupied by stable and palpable image outlines. The Theta excelled in retrieving spatial detail. The acoustic space of the recording was easier to reconstruct as more hall information was resolved. The depth perspective improved, as did image specificity. With the Theta, it was easier to localize voices within the soundstage. On tracks such as “A Quest’ Olmo” and “Non E Di Gentil Core,” the soprano voices were not only better focused but also presented a much greater sense of image palpability. The sensation of being able to reach out and touch someone was dramatically heightened with the Theta. I was startled by the amount of hall information that the Theta was able to retrieve. With the Musik System One I had to work much harder to reconstruct the space of the recording and the relationships of the performers within that space. But to its credit, the Musik System One was smoother and more natural than the Theta through the upper octaves. Soprano voices sounded a bit grainy and tinged with a hint of brightness through the Theta. The upper mids and lower treble of

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the Theta were not quite as round and liquid.

These impressions were consistently reinforced. The Theta in general was spatially more convincing, image outlines being more precisely focused and soundstage dimensions easier to reconstruct. The acoustic signature of a particular hall was much more clearly resolvable. Such hall ambient information as the decay tail of the reverb, while veiled with the Musik System One, was readily resolvable through the Theta. There was simply more low-level detail noticeable—such as small nuances in instrument intonation. As a result, the Theta was able to coax a greater sense of tension and drama from the music than did the Musik System One. However, the upper octaves of the Theta were chronically grainier and not as smooth and edgeless as those of the MSO.

Enter the Cary Audio CAD-5500 analog CD processor. It became clear that the Cary benefited the Theta more than did the Musik System One. All of my objections regarding the Theta's upper octaves vanished. This range was now smooth and quite sweet-sounding. Re-listening to the Lesley Test convinced me that the upper mids and lower treble were as smooth and pure as they ought to be.

If anything, the Musik System One was even more texturally soft and laid-back than before. Its analog-like liquidity was no doubt enhanced by the vacuum-tube signature of the Cary. Again, soundstage transparency suffered by comparison with the Theta. Its window on the soundstage was more opaque, with less feel for the acoustic space of the hall.

Summary

The Musik System One's most captivating sonic quality lies in its ability to deliver musical lines in a relaxed and flowing manner. One is not detracted from the enjoyment of music by an underlying mechanical or electronic character. The midrange and lower treble are very analog-like in that harmonic textures are reproduced with a round, liquid, edgeless quality. The MSO offers a welcome relief from the brash, canned sound of most mass-market CD players, and is fully capable of pushing even an expensive mass-market player over the threshold of greatness: with the help of the Musik System One, the Luxman player was able to transcend its own basically uninspired presentation and enter the realm of high-end sound quality.

The essence of the Musik System One's musical qualities reminds me of the sound of a good moving-magnet cartridge: long-term listenability coupled with textural integrity. To carry the analogy a bit further, the Musik System One's spatial resolution is also in the class of what is afforded by a MM cartridge. Image focus and soundstage transparency are good, and probably satisfying... until you hear what a good moving-coil cartridge can do. The Musik System One lacks the incisive low-level detail and spatial resolution of either the Theta DS Pro or the Pro Basic.

The latter unit competes head-on with the Musik System One in the $2000 price class. The Theta is a finer resolving instrument, and therefore could be said to yield more information for your money. Its downside is that it lacks the textural finesse and smoothness of the Musik System One. The Pro Basic is brasher, more forward, brighter-sounding, and should appeal to audiophiles who have preferred a similar balance from their MC cartridge all along. I can visualize many audiophiles dancing in the streets over the sound of their new Pro Basic—and I can understand why.

From the above comparative analysis, you should have realized that the Musik System One processor is worthy of a serious audition. If you already own solid-state electronics, you may find the MSO much easier to live with over the long haul. The reverse situation, with vacuum-tube electronics, probably calls for the inclusion of the Theta Pro Basic.

And when you do get a chance to audition the Musik System One, be aware of the crucial role that interconnects play in digital data transmission. Unless something on the order of Lindsay-Geyer or AudioQuest Z is used, your listening impressions will not be valid.

Postscript:

JA adds some measurements

As implied by Dick's comments regarding digital interconnects, the Musik System One is fussy about its grounding arrangements. I used a Meridian 208 to provide it with digital data in order to conduct the measurements and found that it was almost impossible to rid the system of a residual hum at around -70dB. Finally, the hum was minimized with the 208 floating and the Musik System chassis separately grounded to the Audio Precision analyzer. This was how the spectral analysis of the processor's output while reproducing a dithered -90.31dB
1kHz tone (fig.1) was taken. It can be seen that the 60Hz component is at a low -116dB or so. Note, however, both the increased level of high-frequency noise and the large amount of second-harmonic distortion overlaid on the tone. With the preamp volume control all the way up, this could easily be heard as a doubling of pitch. Together with the exaggerated level of the tone—recorded at -90dB, it replays at -84dB—this suggests that the Burr-Brown DACs have not been adjusted for maximum linearity. This may be a sample fault, or it may be a systematic manufacturing error. What’s interesting, however, is that, as with the Wadia processors, this misalignment does not result in poor sound.

The departure from low-level linearity is shown graphically in fig.2, which plots the departure of the right channel’s playback level from its intended level from -60dB to -120dB.
using the 500Hz fade-to-zero track on the CBS Test CD. (The left channel was slightly better.) Fig. 3 shows the waveform of an undithered 1kHz tone at -90.31dB, captured with a 30kHz bandwidth. The data representing this signal should actually reproduce as a three-stepped wave, not the spiked signal shown here.

The Musik System's impulse response with the polarity switch up is non-inverting, as can be seen from fig.4, the symmetrical ringing revealing the linear-phase nature of the digital filter chip used. This filter clips at the CD's maximum operating level, as can be seen from fig.5, which shows a 1kHz squarewave at 0dB. (The waveshape shown in fig.5 is the average of 32 different measurements, due to the presence of a considerable degree of random ultrasonic noise present in the processor's output. As no antialiasing filter was used for this measurement, this noise passed through into the storage 'scope and had to be minimized by averaging.)

In the analog domain, the Musik System One was well-behaved, with a flat frequency response (fig.6), low de-emphasis error (fig.7), channel separation better than 60dB across the band, and an excellent rejection of signal-related ultrasonic spurious. Fig.8 shows the spectrum from 300Hz to 30kHz with the processor reproducing a 1:1 mix of 19kHz and 20kHz tones, the composite signal having a peak amplitude of 0dB. The 21kHz product due to the aliasing of the 20kHz tone with the 44.1kHz sampling frequency is well-suppressed, as is the 1kHz difference product, both these things suggesting a clean sound.

Finally, the processor’s output impedance was to specification at 496 ohms, while its maximum output level was a little higher than standard, though still pretty much to specification, at 2.334V.

—John Atkinson$^\dagger$

$^\dagger$ Provided the 'scope triggers at the same point with respect to the repetitive signal waveform every time it captures its samples, the noise, being uncorrelated, is reduced by 3dB compared with the wanted signal each time the number of samples averaged is doubled.

### THRESHOLD STASIS SA/12e

**POWER AMPLIFIER**

Thomas J. Norton

Class-A monoblock power amplifier. Power output: 250Wpc (24dBW) continuous, 500W peak into 8 ohms (resistive or reactive) from 20Hz–20kHz at no more than 0.1% THD. Power bandwidth: DC to 100kHz. Slew rate: 50V/µs. Output current capability: 70A continuous (200A peak).


"Tomorrow we’ll go over to Larry’s house and pick up the Threshold amplifiers."

It seemed like an intimidating project to me, but Danny Sandoval, Stereophile’s intrepid chief of Shipping and Receiving, didn’t bat an eye. But then, anyone who’d schlepped the Thiel CS-5s out to the desert in the predawn hours—to be photographed for Stereophile’s June 1990 cover—wasn’t likely to be defeated by a pair of measly 130-pound amplifiers.

As for me, well, I’ve been known to go into training at the prospect of moving loudspeakers half that weight. Still, the anticipation of reviewing a pair of monoblock amplifiers which (to my knowledge) would break the Stereophile review record for size, weight, and (not coincidentally) cost, made the effort seem tolerable. LA had been using Threshold’s flagships on and off for a few weeks while I was ensnared in other reviews. But the time had come for me to give them a listen. I’d prepared the way by building a pair of support bases$^1$ to elevate them off the carpet and provide proper ventilation.

Danny and I managed to move the Thresholds without major incident, despite my trepidations. Handles are provided front and rear for “easy” two-man carriage. But I recommend against trying to handle these amplifiers by yourself unless your health insurance is paid up and you can afford a long-term relationship with your chiropractor. When I mentioned all

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$^1$ A fancy name for two painted sheets of 0.75" plywood with feet made of eye-bolts anchored in T-nuts.

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of this to JGH, he suggested that it was time for some enterprising manufacturer to market an "Ampli-Hoist."

The Stasis SA/12es appeared even larger when moved from LA's wide-open spaces to the more typical 15' by 20' (Stereophile) listening room that DO and I currently share. Placing them between the loudspeakers—the only practical location—made me feel as if I were in a CES exhibit. I felt like putting out brochures and brewing coffee. I had to turn the SA/12es sideways to allow room for DO to set up other amplifiers for his listening sessions, obscuring Threshold's striking front-panel cosmetics but providing easy access to the rear input and output terminals. No one ever claimed high-end audio was easy.

Aside from its sheer bulk and obvious quality construction, there's not much to say about the outside of the SA/12e. The large meters of earlier generations of Threshold amplifiers are conspicuous by their absence—but then, meters in general appear to be disappearing from high-end amps (they were never of much practical use). A massive on/off switch (which, backing up the line fuse, also acts as a circuit breaker that trips if a significant fault occurs) is the only front-panel control. On the rear are the sockets for the four power-supply rail fuses, balanced and unbalanced inputs (and a switch to disable the latter), and heavy-duty output terminals. The latter are not five-way binding posts, but are designed to be used with spade lugs. I initially had mixed feelings about these terminals. They are, as I understand it, custom-made for Threshold and are certainly impressive-looking. But they require a wrench to fasten down tightly (I know of no nut-driver large enough). To use the wrench without obstructions requires that you do the tightening before connecting the input and power leads. And the spade lugs provided on most audiophile brands of loudspeaker cable are just not large enough to make the best use of Threshold's terminals (though they'll work well enough). But despite these disadvantages, I really appreciated these terminals when I looked at them from inside the amplifier and saw their long, solid, rear shanks and the heavy output-stage to output-terminal leads soldered onto large, metal plates firmly attached to them. Anyone who's seen the skimpy rear solder lug on the amplifier end of conventional five-way binding posts would be similarly impressed. The lugs on ordinary posts simply don't permit the attachment of internal leads comparable in size to the loudspeaker cables currently used by many audiophiles. Threshold's do.
The huge heatsinks of the SA/12e hint more than subtly at the works inside. All circuit boards are military-grade glass epoxy; the front-end boards have gold-over-nickel paths and gold plated-through holes. There are no capacitors in the signal path, making the Thresholds DC-coupled. (As with all such amplifiers, the user should insure that his or her preamp or other source does not feed DC into the amplifier.) Outside the signal path, capacitors are film and silver mica. Resistors are metal-film and wire-wound, depending on application. The output stage of each amplifier consists of 64 transistors, each rated at 200V, 250W, and 20 amperes—with peak-rated amperage and wattage at twice those values. This represents a power-dissipation margin of about 50W of output device for each output watt. Sort of a conservative design, no? Because of this seeming “engineering overkill,” neither protective circuitry (other than thermal shutdown protection for overheating, which is incorporated) nor fusing between output transistors and loudspeaker load is provided for or required. The power-supply fuses provide the only protection needed. No amplifier is unsinkable, but Threshold clearly feels that they have made the risk low enough to justify elimination of circuitry which has a reputation for degrading sound quality.

The power supply of the SA/12e consists of twin 1200VA toroidal transformers (with a short-term capability of twice that value) and 250,000μF of total filter capacitance. You can get some feeling for the sheer size of this power supply from the caution in the owner’s manual to position “hum-sensitive” equipment at least 18” away to guard against possible noise generation. The quality of the supply is also indicated, perhaps surprisingly, by Threshold’s 0dB dynamic-headroom rating for the amplifier. They argue that headroom specs provide a measure of the difference between an amplifier’s continuous and short-term capabilities. That distinction blurs in an amplifier such as this, with its extremely rugged, stiff power supply. And in an amplifier this powerful, who’s concerned about “dynamic headroom” anyway? One could argue, with some justification, that this is, again, “overkill,” that music is a dynamic phenomenon in any event, and that a less “brute-force” approach is perfectly adequate. Threshold clearly is not shooting here at a target of “perfectly adequate.”

**Design**

There’s more to the SA/12e than just quality parts and fortress-like build quality. The design thoroughness begins at turn-on, in which internal components are protected against surges by a controlled power-supply charge-up. To give you an idea of the initial current draw of these amplifiers, turning one of them on caused the line voltage to dip from 118 to 106V for an instant; with both amplifiers idling, the line voltage stabilized at about 114V—a 4V drop from the level sans Thresholds. The SA/12e, being fully class-A from input through to and including output stage, draws its maximum power from the line at idle—about 1000W for the pair. Its heatsinks, however, are efficient; they get quite warm, but never to the point where you cannot keep your hand on them indefinitely. The heatsinks of the class-A Levinson No 20.5, on the other hand, operate decidedly hot to the touch despite that amplifier’s considerably lower power rating.

To maintain constant bias within the amplifier under dynamic conditions, Threshold uses a patented optical bias system. By the use of so-called “opto-isolators,” the necessary current information is obtained from the output stage without the bias circuitry interfering with its operation. Optically coupled circuitry also adjusts the front-end bias for perfectly balanced operation. Threshold also claims that the optical bias system maintains the active elements at a much more constant temperature than conventional bias circuits, reducing the stress on these devices and thereby prolonging their life.

The input of the Threshold uses proprietary circuitry requiring no additional active components for balanced operation beyond that used in the unbalanced mode. The input stage itself consists of N-channel J-FETs in a cascoded configuration having a high input impedance and only a few dB of local feedback. In fact, one of the design criteria of the entire line of Threshold amps appears to have been the elimination of overall, “global” feedback.2

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2 If using other than a Threshold preamp, check with the maker of your preamp or other source, such as a CD player which is fed direct or via a passive preamp or attenuator.

3 That’s not a misprint. 64. As in 8 by 8.

4 Feedback from the output of an amplifier to the input. As contrasted with local feedback, encompassing usually one gain-stage.
Threshold is not the only high-end company attempting to minimize or eliminate global feedback, and not without some justification. In theory, feedback gets you "something for almost nothing." It trades gain (which modern solid-state active devices can provide in cheap abundance) for improved linearity (lowered distortion) and improved bandwidth. But the case against negative feedback argues that it really only performs its function perfectly with continuous signals. It thereby makes another tradeoff: good test-bench figures for less predictable performance with real-world, non-continuous musical signals. It must be said here that not all high-end amplifier manufacturers agree with this; some have produced well-received amplifiers, using significant amounts of feedback, to prove their case. Still, the prevailing trend appears to be the minimization of global negative feedback.

With or without feedback, the basic problem in any amplifier is how to get its output to exactly replicate its input, only more so. The easily understood concept of anemic little electronics struggling from the preamp to the input of our power amplifier, where they enter a Gold's Gym of circuitry, only to be pumped up to do battle with our awaiting loudspeakers, is serviceable but misleading. In actuality, the inputs of our amplifiers merely act to control the reservoir of current capability in the power supply. The varying voltage of the input is increased by the early stages of the amplifier. Finally, the output of the last voltage amplifier stage literally acts as a gate on the output transistors, which provide power to the loudspeakers sourced from the amplifier's power supply in a manner which varies in accordance with this control voltage. At least that's how it usually works.

Threshold's approach to providing the required drive to the loudspeakers without the need for global feedback is slightly different, and is centered around their patented STASIS circuitry. This configuration, developed for an earlier generation of Threshold amplifiers, is continued in the new "e" series. A small, high-quality, class-A-operated voltage amplifier is connected directly to the load (the loudspeaker). This amplifier must be able to deliver, in theory, whatever voltage is required across the load to provide the sound level demanded—within the power limitations of the amplifier. Notice that I said "in theory." In actuality, it would not be able to do this unaided; a voltage amplification stage does not like to supply current into low impedances of the sort typical of our loudspeakers. The output voltage sags badly under load (which is, simplistically, why your preamp won't make much of a sound driving your loudspeakers directly). Threshold's voltage amplification stage is a bit more capable than that: it will put out between 5 and 10 amps of current before its output voltage linearity starts to suffer. To provide the remainder, a current source (which Threshold refers to as a current mirror bootstrap) is connected both to the load and to the voltage amplifier. The latter then establishes the required voltage while the former (actually the output transistor complement of the amplifier) furnishes the current needed through the load—drawing on the power supply to provide it. The voltage amplifier is therefore able to maintain the required voltage without sagging. (Of the 64 output devices in the circuit, 60 appear to be in the "current mirror bootstrap," four in the voltage amplifier stage.) Put more simply, in the STASIS design the final voltage stage and the output (power) stage operate in a symbiotic, tandem arrangement. The bottom line: high intrinsic linearity without recourse to global feedback.

All Threshold amplifiers incorporate this STASIS circuitry. The differences from one amplifier to the next are in the number of output devices and the size of the power supply—altering the available power—and in the use of full class-A bias (the SA series) or a combination of class-A and class-AB bias (the S series, which operates at class-A until about 20% of rated power, then transitions to -AB) in the final current bootstrap section. In the case of the class-A amplifiers, of which the SA/12e is the most powerful, they will operate, at 8 ohms, in pure class-A at their rated power, but things become more complex at lower load impedances. The amplifiers will roughly double in continuous power output capability for each halving of impedance (to a point), but will not continue to operate in class-A up to that power level. In the case of the SA/12e, it will put out 500W continuously into 4 ohms, but will leave class-A at 125W into that impedance. It will deliver about 800W into 2 ohms (though distortion rises to about 1% there), but only about 65W of this will be class-A. Into 1 ohm the
respective values are 1300W (1% distortion), overall about 30W class A. The SA/12e is rated to operate into impedances below 1 ohm and into highly reactive loads, but continuous operation at these extremely low impedances will be limited by the power-supply fuses and thermal limiting. Again, the bottom line: Threshold’s claims would seem to argue that the SA/12e will be unflustered by any known loudspeaker load.

It should also be pointed out that Threshold rates the SA/12e for 60 amperes continuous output. I’ll admit that I have a problem with this figure—it seems hypothetical at best. Sixty amperes into 8 ohms gives a continuous output figure of 28,800W, a patently nonsensical figure which bears no relationship to either the continuous power output rating or the 250W continuous dissipation rating of each output device. I asked Threshold’s designer Nelson Pass about this, and he stated that this rating refers to the amplifier’s ability to supply current into very low impedances—fractions of an ohm. Unless the conditions are more carefully specified, I consider the continuous power rating per se to be academic in real-world use at best, potentially misleading at worst. But Threshold is not the only company quoting output current capability.

Threshold also makes a point of the fact that their STASIS designs maintain a constant (and high) damping factor over the full audio band. Contributing to this is the lack of overall feedback and the elimination of the ubiquitous output inductor (between the final output stage and the output terminal) required in most conventional designs.

**The System**

OK, so we know that the big Thresholds are built like tanks compared with the go-cart construction of more real-world (pricewise) amplifiers. Two questions must be answered here. Are they among the best amplifiers in the world? (They better be, to justify the cost.) And are they really superior to considerably less expensive amplifiers?

To attempt to answer these questions, I used the SA/12es in a system consisting of the Oracle Delphi Mk.IV turntable with Oracle 345 arm and Dynavector XX-1L cartridge, Sony CDP-X77ES CD player used as a transport with coaxial link to an Esoteric D-2 D/A converter, Rowland Consonance preamp, and B&W 801 Matrix Series 2 loudspeakers (no LF equalizer used). Interconnects were AudioQuest Lapis (with the exception of the coaxial CD transport to processor link, which was a garden variety but 75 ohm video cable); loudspeaker cables were AudioQuest Clear Hyperlitz (bi-wire pair). The preamp-to-power-amp link was about 25', the loudspeaker cable length was 7'. A balanced preamp-to-power-amp link was used throughout the auditions on the reasonable (I believe) assumption that anyone purchasing an amplifier in this price category offering balanced inputs will want to use those inputs—if not now, then certainly eventually. If you already own a good pair of unbalanced pre/power amp interconnects for which you paid an arm and a leg, the manufacturer should be able to re-terminate them with balanced connections for far less than the cost of new cables. And practically all new high-end preamps are designed with a choice of unbalanced or balanced outputs.

I encountered only one problem with the hookup of the SA/12es. Used with a normal three-prong AC cord, a ground loop was formed (the preamp also uses a three-prong plug, and with the usual result: hum. Threshold states that this should not be a problem with balanced interconnects, but I did not find this to be true in my case. I found it necessary to use cheaper plugs (which I have also had to use with other amplifiers) on the SA/12e power cords to eliminate the problem. Threshold recommends that it is more desirable for “cheating” to be done at the preamp, but it was not convenient to do so in my setup.

**Sound**

After letting the big Thresholds “cook” in my listening room for a day or so, I was ready for a serious listen. First up was a recording that has had a lot of play around here lately: *Fairy Tales* (Odin CD-03). The image was precise and stable. High-frequency response was clean, with sibilants clearly audible (as they tend to be on this recording) yet totally free of spit or sizzle. Radka Toneff’s voice was there, suspended in space between the loudspeakers. It was somewhat breathy in timbre (again, this seems to be a recording artifact), but convincingly real. The sound was open, with believable ambience. The analog-mastered cut (band 5) was clearly different in sound from the digital; both voice and piano were a bit sweeter, with a striking sense of space surrounding.
both. Not a bad start.

And the positive first impressions held up. The most consistently recognizable qualities of the SA/12es were a gorgeously clean, natural high end with superb yet subtle detailing and an almost tactile midrange. Solo voice was consistently well-reproduced. The driving vocal and guitar rhythms on “Better Than Any-

thing,” from Tuck and Patti’s *Tears of Joy* CD (Windham Hill Jazz WD-0111), were thrilling. Especially notable here were Patti Cathcart’s terrific scat singing, tightly defined and detailed — totally devoid of harshness even at quite high playback levels. The real value of a good ampli-

fier in a good system is not so much what it gives you as how well it lets you enjoy the music without being distracted by sonic flaws. The Thresholds passed this test with colors fly-

ing, on this and other recordings.

On “Stardust,” from Rob Wasserman’s *Duets* LP (MCA-42131), I found myself forgetting to take notes. Putting on my old, shopworn critic’s hat became a chore. Definition was beautifully drawn yet never clinical—sweet but with no feeling of loss of detail. Voices in the mix were well differentiated. The midrange was strik-

ingly clear. Natural sound is a complex mixture of the soft and rounded punctuated by tran-
sients of all descriptions; the Threshold ren-

dered all of these subtle shadings in a musically rewarding fashion.

You’d expect a powerful amplifier with a high damping factor to produce a deep, solid, well-controlled low end, and you’d be right in the case of the Threshold. The bass drum on José Neto’s *Mountains and the Sea* LP (Water Lily Acoustics WLA CS 02) was punchy as I’ve ever heard it through the 801s. The collapse of “The Beast” on *Dafos* (Reference Record-
ings RR-12CD) was thunderous, and the “Beam” in *Psychopomp* on the same recording was deep, growling, and downright eerie. The 801’s bass tends to some warmth — especially in my current listening room, which is slightly smaller than the previous one and has a suspended floor — and the Thresholds were not able to make it as taut as I would like. But that’s hardly the fault of the amplifiers. The low end was still very impressive.

My only reservation about the sound of the SA/12es came in the area of soundstaging. Lateral imaging was most precise — witness the drum set on “Brekkens Farm” from Flim & the BB’s *Neon* (DMP CD-458). The individual parts of the set could be precisely located from left to right — within inches. But on this and other recordings I didn’t always get quite the same sensation of three-dimensional depth that I have obtained with other amplifiers. It was a sometime thing, however. I never felt a specific lack of depth when listening to the Thresholds by themselves. But the Thresholds do not have a laid-back sound. They are punchy and driving, and that up-front character tends to make depth less evident than it is with more retiring amplifiers. More on this shortly.

Listening to the SA/12es in isolation left no doubt about their quality. But how do they compare with other top-drawer units? Amplifiers of the price and power rating of the SA/12es are not exactly thick on the ground, even here at *Stereophile* Central. I decided on an end-run: the Mark Levinson No.23 (comparable in power) and a pair of Levinson 20.5s (class-A monoblocks comparable in price,7 but at 100Wpc having considerably less oomph).

The results in both instances were intriguing. While I have to say that the Threshold came out on top, overall, in my judgment, the votes were decidedly mixed in many areas and the race was in no way a runaway. The No.23 was the first in the docket.

On the aforementioned *Tears of Joy*, the Threshold appeared the more coherent and dynamic. It actually seemed louder than the Levinson, though the relative levels had been closely matched by measurement. The Threshold reproduced Patti’s voice in a more solid, gutsy manner — more “there.” The Levinson was more laid-back, with highs that were a bit more prominent; sibilance was stronger, less smooth. But in no way was the Levinson over-

etched. Score a close point for the SA/12e. On Jay Leonhardt’s *Salamander Pie* (DMP CD-

442),8 the Levinson’s high end was crisper and more obvious, but in a highly attractive way. It sounded airier and more three-dimensional. But the double-bass was marginally more lively over the Threshold, and the latter continued to present a more live-sounding midrange. This one was a draw. On the Astrée sampler CD (E7699) the baton was passed back and forth.

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6 This is not necessarily an analog vs digital issue, as this cut was recorded in a different studio under different conditions.

7 Well, sort of. $12,000/pair (Levinson) vs $14,400/pair (Threshold).

8 The lyrics of the title song alone are worth the price of admission.
the Levinson ultimately edging out the Threshold; the Levinson's slightly more prominent top end and laid-back quality gave it an airiness, depth, and "see-through" transparency which counted for more on most of the bands on this recording than did the Threshold's punch, drive, and, I feel, somewhat more accurate timbre and perspective. The opposite was true of Fantastic Journey, one of Telarc's (CD-80231) seemingly inexhaustible series of "theme" albums from Eric Kunzel and the Cincinnati Pops. Here the top end of the Levinson was overly crisp, the blat of the brass and shimmer of the cymbals taking on an edge that the Thresholds lacked. And the latter had the punchier bass, but only by a hair. The major difference in the low end between the Thresholds and the Levinson was in tauness (the Levinson being somewhat fuller and warmer), not in weight or extension.

Again, the race was a tight one. But the points started to add up in the SA/12es' favor. One particularly telling selection—though the CD set on the whole is far from reference quality sonically (I consider it dynamite in both music and performance, however)—was "What a Waste," from the original London cast recording of Miss Saigon (Geffen 9 24271-2). Early on a chorus enters, largely female in the center, largely male to the left and right. Through the Levinson the distinction between these groups was subtly smeared; the definition from the Thresholds was marginally but tellingly superior. And Jonathan Pryce's performance on the same piece seemed more "on" through the Thresholds, his vocal inflections more precise. I knew—this doesn't seem like the sort of thing an amplifier can do. All I know is that I found this selection more of a knockout through the Thresholds: the difference between a superior performance and a show-stopper.

And what about the Thresholds in comparison with the Levinson No.20.5s? First of all, the 20.5s were closer in sound character to the No.23 than to the Thresholds. Clearly the Levinsons had a family sound. The 20.5s seemed a bit sweeter at the top than the 23, though both had quite similar timbres in this region. Both were less punchy and palpable than the Thresholds through the midband, and both gave a more obvious sense of depth. Compared with the Thresholds, I found myself strongly attracted to the airiness of the No.20.5s and their way with a three-dimensional sound-space. But the Thresholds seemed to have a timbre that was right. The Levinsons were more immediately impressive for their detailing, and while that detailing never seemed overt or etched, the more subtle top-end presentation of the SA/12es was a powerful draw, as was their midband vitality. And while we're on the subject of power, the Levinsons had a lot more sock than their 100W rating would lead you to expect, though they definitely ran out of steam—evidenced by congestion of the sound and reduction of fore-aft depth and transparency—before the Thresholds. Not exactly an unpredictable outcome, considering the power difference. It must be noted that with all four of these current-happy monoblocks running at once, the line voltage dropped to between 106 and 109V. This put the Levinson at something of a disadvantage against the more powerful Threshold, though the former's power supply is heavily regulated. The Threshold's is not.

Measurements

I didn't really expect any surprises in our measurements of the SA/12e, and none were found. It would, in fact, be hard to imagine better objective performance at the current state of the art. Frequency response was a total non-event—that is, flat within 0.1dB from 20Hz-20kHz (fig.1). Fig.2 shows the Threshold's THD+noise. The three lowest curves indicate respectively the low power figures of 1W into 8 ohms, 2W into 4 ohms, and 4W into 2 ohms. The third curve from the top is the 250W into 8 ohm measurement. It edges just barely over the 0.1% specification above about 18kHz, but by a trivial amount which could be accounted for by slight differences in line voltage and grounding. Note that at 850W output into 2 ohms, the distortion remains well below 1%. Although not shown here, levels of intermodulation distortion were equally low.

Clipping of the SA/12e (for 1% THD) was measured at 310.9W (24.9dBW) into 8 ohms (line voltage 115.5V), 542W (24.3dBW) into 4 ohms (line voltage 114V), and 898.9W (23.5dBW) into 2 ohms (line voltage 111.5V). Gain measured 27.5dB unbalanced and 26.7dB balanced (source impedance 50 ohms), both measured with the amplifier loaded with 8 ohms, implying a balanced sensitivity for full output into

9 Though you should know that some of the lyrics are R-rated.
briefly, the Wilson Audio WATT/Puppies.

8 ohms of 2.3V.

Output impedance from 20Hz–1kHz remained below 0.032 ohms for any load from 2 to 8 ohms; it rose slightly at 20kHz, but still below 0.04 ohms with the same loads. This verifies Threshold’s claim of a high damping factor across the entire audible bandwidth, and indicates that the SA/12e response should be a constant with virtually any real-world loudspeaker/loudspeaker cable load. (Remember, when a loudspeaker “looks back” at the amplifier, it sees not only the amplifier’s output impedance but the impedance of the cable as well—including the loudspeaker’s internal wiring. That will determine the ultimate damping at the loudspeaker, and may also have an effect on the latter’s actual response, though rarely a significant one.)

Conclusions

Before closing out my listening sessions with the Thresholds, I was able to audition them, briefly, in my listening room driving a different pair of loudspeakers: The Wilson Audio WATT/Puppies. This was clearly a loudspeaker with a different character from that of the B&W 801s—more high-end energy, a leaner, tighter midbass, and a less extended extreme low end. But through these very different transducers the Threshold continued to display its open, lively midrange, detailed yet not overdone high end, and controlled bass. It is too early to judge if this is the best amplifier for these loudspeakers; a full review of the Wilsons is scheduled for a later issue. But I was not disappointed by the combination.

So do the Thresholds justify their lofty price? Is this trip really necessary? Yes and no. They provided, overall, the best performance I have ever obtained from my 801s. The latter, combined with the Levinson No.23, had been happy campers in the past, and that combination remains rewarding today. The Thresholds do not “blow it away” in any dramatic fashion. But they do differ from the No.23 in ways that will be significant to some listeners, subtle or unimportant to others. The same may be said of the Levinson No.20.5 comparison. The power output of the No.23, at least, is comparable to that of the Thresholds, but the price of the former is less than 40% of that of a pair of SA/12es. Threshold’s own S/550e offers the same power (in a stereo, single-chassis, class-A/AB design) for less than half the price of a pair of SA/12es. And I intend to compare the two for an update when RH finishes his pending review of the S/550e.

The SA/12e is an imposing, stunningly good-sounding amplifier. Of that much I am absolutely certain. What is far less certain is the value of this amplifier to any given buyer. No one in his or her right mind, of course, would consider such a purchase without an extensive home audition—at this price, nothing less would be acceptable. For most of us, of course, amplifiers such as the SA/12e will remain pie in the sky. For those who might be barely able to afford the stretch in our audio budgets, the money might be better spent on one of the many excellent but less expensive amplifiers (Threshold’s included) and a new pair of loudspeakers. Or a new turntable. Or acoustic treatment for the listening room. Or a trip around the world. But the SA/12e is worthy as a benchmark of state-of-the-art thinking in amplifier design. For those few readers who can genuinely afford and justify it, I can’t imagine their being anything but ecstatic with the results.

10 As I write this, news has arrived of a new Levinson No.23.5, a substantial, and somewhat more expensive (early word: $5900 vs $5295) redesign of the No.23. Stay tuned.

Stereophile, December 1990
ICON PARSEC LOUDSPEAKER

John Atkinson


"My vision for the future is one where all manufacturers sell their products directly to the end user. In this way, even the audiophiles in Dead Horse, Alaska can have access to all the audio manufacturing community has to offer." Thus wrote loudspeaker designer David Fokos in a letter introducing his new company Icon Acoustics to the press at Stereophile's High End Hi-Fi show last April. Mr. Fokos, a Cornell graduate who for some years worked for Conrad-Johnson Design and designed that company's well-regarded Synthesis and Sonographe loudspeaker models, feels very strongly that the traditional retailing setup is inefficient when it comes to exposing audiophiles to a wide enough choice of product, particularly when it comes to loudspeakers. With 300 speaker manufacturers listed in the Audio directory issue but even a major retailer restricted to probably six brands, even big-city audiophiles will only be able to audition a fraction of the total number of brands. "Our industry is suffering from product saturation of its retail distribution network."

Dave went on in his letter to develop the theme that, in an analogous manner to personal computer retailing, where Dell Computer became immensely successful by bypassing the entire retail setup, a loudspeaker manufacturer can better serve his customers by selling directly to them. By doing so, he ensures that the customer can audition the loudspeakers at length in the best possible location: his or her own listening room. "Rather than the 20 or 30 minutes you usually have to make a decision in the store, Icon gives its customers 43,200 minutes,"

Dave claims, due to his policy of shipping a pair of loudspeakers via Federal Express for 30 days' home trial to the customer who calls Icon's 800 number. At the end of that period, if the customer is not satisfied, he or she returns the speakers to Icon at Icon's expense, again via Federal Express, and receives a full refund (provided the speakers are undamaged).

Icon is not the first loudspeaker manufacturer to go this route. Henry Kloss's Cambridge SoundWorks has done very well with its range of inexpensive systems (including the $250/pair Ambiance that I reviewed last March), and has now extended its mail-order operation to sell Denon, Magnavox, and Pioneer portable CD players, laser disc players, and Dolby-surround processors. And the commercial success of The Audio Advisor, Crutchfield, and Audio Express confirm that many audiophiles like to buy by mail-order. But Icon Acoustics is the first company, as far as I am aware, to sell exclusively high-end loudspeakers by mail.

Icon's range currently consists of two models: the two-way, stand-mounted Lumen at $695/pair, and the floorstanding, three-way Parsec at $1495/pair, which marries the Lumen's drive-units to a 10" woofer. (Both prices include Federal Express delivery charges.) After some discussion with Dave, I decided to request a pair of Parses for review.

The Parsec's large, well-proportioned cabinet is constructed from ¾" MDF (medium-density fiberboard), veneered on both sides, and is extensively braced in its bottom half.

1 The Icon room at the show, which featured their speakers driven by a Mark Levinson No. 23 power amplifier via AudioQuest Green Hyperlitz cable, came in an excellent 15th in the visitors' poll on the best-sounding room.

2 Though well-protected in its double shipping carton, the Parsec lacks any kind of plinth, so it is essential to unpack it on to a carpeted floor if the veneer is not to be chipped at the speaker's base. I also think it would be a good idea for Icon to mark the inner carton as to which is the Parsec's base and which ends its top, to avoid the carton being opened upside-down. I learned these things the hard way, of course.

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both front to back and from side to side. The review samples were finished in a light oak veneer—Black Oak and American Walnut are also available—and were visually somewhat imposing. The enclosure is filled with what appears to be 1.5"-thick polyurethane foam and some acrylic wadding. In the top half of the cabinet, a 45° sloped internal board completely separates the woofer enclosure from that of the midrange driver and tweeter. The two ports, each 14" deep and 2" in diameter, are placed on the front baffle just above the woofer, which is held in place by no less than eight hex-head bolts. The woofer uses a graphite-impregnated pulp cone with a rubber half-roll surround and has a putty-like damping material applied between its magnet and chassis. The midrange unit is made by Vifa in Denmark and features a shallow-flared polypropylene cone of approximately 5" radiating diameter. Completing the lineup is a version of the familiar 1" aluminum-dome tweeter from SEAS in Norway, this recently heard in the Signet SL280 as well as in the Meridian D600.

As with the Allison floorstanding speakers, because of the close spacing of the Parsec's woofer to the floor, the normal "floor dip" in its response, due to the interference between the driver's direct output and the reflection of its sound from the floor, will be pushed up to around 500Hz, well above its passband. Similarly, because the midrange unit is 36" from the floor, its floor dip will occur at around 170Hz, an octave below its passband. Unlike conventional stand-mounted or floor-standing loudspeakers, therefore, the Parsec will maintain its full response throughout the lower midrange. Whether this is appropriate or not is open to question. There is no doubt that the human ear and brain are used to hearing a dip in a sound source's spectral response in this region—it happens every time someone speaks to you, for example—and it is possible that human beings have learned to tune it out. In addition, this drive-unit layout results in the maximum excitation of floor-to-ceiling axial room resonances. With its close proximity to a boundary, the woofer's efficiency will be also increased somewhat compared with its behavior in free space.

As befits its high-end heritage, the Parsec's crossover is no ordinary beast. Following the electrical signal on its journey from the two pairs of elegant Tiffany binding posts, doubled
runs of AudioQuest Type 4 cable take it to the bass low-pass filter. This is a second-order type with more of a slow-rollout Bessel characteristic than the more usual Butterworth, and consists of a series ferrite-cored choke—said to handle more than 500W before saturation—and a shunt capacitor, this a polypropylene-dielectric type from Solen in France bypassed with a smaller-value polystyrene. The signal, now with frequencies above 350Hz filtered from it, is taken to the woofer with another doubled run of AudioQuest Type 4.3 The tweeter/midrange crossover is constructed on a separate board, with all the components hard-wired to short lengths of tag strip. Both high-pass and low-pass slopes for the midrange unit filters are second-order, with a Bessel characteristic. Air-cored coils are used, but again the capacitors are Icon's parallel mix of low-value polystyrenes and Solen polypropylenes. The tweeter carries the signal above 1500Hz—a lowish frequency, considering that it is fed by a first-order filter. Some tonal shaping is also applied to the tweeter's drive signal. Single runs of AQ Type 4 cable are used for the two upper-frequency units.

All things considered, the standard of construction and quality of parts are outstanding for what still must be regarded as an affordable loudspeaker. Without a dealer's margin to be allowed for in the price, Dave Fokos has apparently passed on all the saving to his customers. Cool, Dave! (Are we baby boomers still allowed to say "cool" in the '90s?)

**Review context**

Source components used in the preparation of this review consisted of a Revox PR99 to play 15ips master tapes, a Linn Sondek/Lingo/Ekos/Troika setup sitting on an ArchiDec table to play LPs, and the Meridian 208 (Bitstream) CD player. Amplification consisted of a Mod Squad Phono Drive EPS hooked into one of the line-level inputs of the Meridian 208 CD player, which in turn drove either an Audio Research Classic 60 or a pair of Mark Levinson No.20.5 monoblocks via 15' lengths of AudioQuest Lapis unbalanced or balanced interconnected, respectively. Speaker cable was 5' lengths of AudioQuest Clear Hyperlitz, doubled-up for biwiring.

I use a mixture of nearfield, in-room, and quasi-anechoic FFT measurement techniques (using primarily DRA Labs' MLSSA system with a B&K 4006 microphone, but also an Audio Control Industrial SA-3050A \(\frac{1}{2}\)-octave spectrum analyzer with its calibrated microphone) to investigate objective factors that might explain the sound heard. The speaker's nearfield low-frequency responses and impedance phase and amplitude were measured using the magazine's Audio Precision System One.

**Sound**

The Parsec Owner's Manual advises that the speakers sound best after 50–100 hours of use to break in the drive-unit suspensions. Accordingly, I ran them in with pink noise at a high level for two days. (The speakers were wired in anti-phase and placed face to face during this process.) The serious listening could then commence: following some experimentation, I ended up with the Parsecs some 6' from the longer rear wall (which is faced with books and LPs) in my 20' by 17' by 9' listening room, and first 5', then approximately 4' from the shorter side walls (which also have bookshelves covering some of their surfaces). This gave minimum excitation of the room resonant modes between 50 and 120Hz, but also the best balance between a good feeling of upper-bass power and low-bass extension. (Sitting Duck Software's Listening Room program, reviewed elsewhere in this issue by Tom Norton, confirmed that this placement was pretty much optimal, the boundary reinforcement of the speaker's output between 70Hz and 250Hz being effectively flat with frequency with only a slight peak at 180Hz, a dip at 55Hz, and 10dB or so of room gain below 40Hz.)

With the speakers in this optimal position, I inserted three of the supplied spikes into the base of each one. These are not threaded and are a tight fit. The easiest way to insert them was to work them as far as possible into the pre-drilled hole, then let the weight of the speaker do the work. Though the Parsec is supplied with a large black-fabric grille which surrounds the tweeter area with thick gray foam, I was advised that the speakers sound best without the grille; accordingly, I left it off. (Later mea-

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3 Icon can take orders for AudioQuest cable at a special price from their customers; AudioQuest will ship the cable directly to them.

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4 I enthusiastically echo Tom's recommendation for this program. Even if you don't own a computer, bully your dealer into buying The Listening Room to help his/her customers get the best from the loudspeakers they buy from him/her.
surement showed the effect of the grille was quite minor, however, at least on the on-axis sound.)

Listening first with the Classic 60 driving the Parsecs, my first impression was of a warm-balanced sound with a generous bass response and an open, uncolored treble. Listening on a high chair so that my ears were level with or above the cabinet top accentuated the midrange, giving a somewhat "squeaky" character, while listening on the tweeter axis exaggerated the top two octaves a little. But on the midrange axis, my ears some 36" from the ground, the Parsec's high-frequency balance complemented my ancillaries and listening-room acoustics to give perhaps the most natural treble balance that I have yet heard in this room. The strings on the Sheffield Lab Firebird recording (LAB 24), which was made with a coincident pair of Coles ribbon microphones, were about as natural-sounding as I have ever heard them. Some listeners, however, may think that the Parsec sounds a little dull; nevertheless, I prefer errors in this direction, given that, with a few exceptions, most amplification tends to err in the opposite direction. And to be honest, when was the last time you heard live violins with the kind of electronic tizzy sheen so often heard from reproduced strings?

Overall, the Parsec's midrange was pretty neutral, tenor and treble instruments sounding very true to the original, as did female voices. The trumpets and trombones on the Firebird featured the appropriate degree of "blatty brassiness," to borrow a phrase from J. Gordon Holt; in fact, orchestral music in general had an uncolored, musically natural presentation in the midrange and above. Via the Parsecs, the Chesky reissue of Richard Strauss's Der Rosenkavalier Waltzes from the RCA Symphony Orchestra conducted by Chuck Gerhardt (CD35), a Kenneth Wilkinson recording and a current CD favorite of mine, swept me up in its Romantic embrace, aided by the loudspeaker's warm lower mids.

Lower down in frequency, however, I did find some coloration, as well as a degree of tonal imbalance. "Generous" was the adjective I used to describe the Parsec's bass performance, but let me expand on that rather nebulous word. This loudspeaker managed to deeply excavate the nether regions, yet without the lows degenerating into a muddy, murky roar. An organ recording spending much time in my CD players these days is Jean Guillou's inaugural recital at the Church of Saint Eustache near Les Halles in Paris (Dorian DOR-90134). The last track in particular, Liszt's Fantasy and Fugue on B.A.C.H., thunders out four nearly identical bass notes (in German music notation, B is B-flat and H B-natural) in quick enough succession that the quite reverberant church acoustic seems in danger of sound-swirling overload. Certainly on reflex speakers that have any propensity to bass boom, the whole low-frequency spectrum clags up, the result being that pitch definition suffers. Via the Parsecs driven by the Mark Levinsons, even at high (greater than 100dB) SPLs, you could still easily differentiate the individual notes, implying a degree of musically appropriate overdamping to the speaker's ported bass alignment.

This was confirmed by the bass-drum thunderclaps that punctuate the "Infernal Dance" in the Sheffield Firebird recording. Possessing Levinson-sourced cataclysmic weight over the Parsecs, these mighty strokes remained free from low-frequency overhang. Even with the speakers driven by the Classic 60, there was a good degree of control even though the tube amp could not produce anything like the same sense of air motion.

These impressions were all gained with the speaker used as designed. In case some listeners do find the lows to be still a little under-controlled, however, Dave Fokos recommends rolling up a plastic report cover and inserting it all the way into each port. Even with the Classic 60, which has an output impedance of about a third of an ohm from its 4-ohm taps, I felt that this tuning tip dried up the low bass too much. With VTL, Quicksilver, Lazarus, Carver, or Conrad-Johnson amplifiers, however, all of which can have output impedances of up to or exceeding an ohm, it would probably prove effective in allowing the amplifier to better hang on to the woofer's excursions.

Having satisfied myself that the speaker's low bass was excellent, in absolute terms, I felt the Parsec to have too much mid- and upper-bass energy. While this added a quite exciting degree of impact to typical rock recordings—the Stigian synth just purred in Simple Minds' "Let it all come down," from the band's The Amsterdam EP (Virgin SMXCD 6)—it was a little too good to be true. Not that I'm complaining, mind. But I should point it out, particularly as this midbass balance will make finding the opti-
In her eponymous track from *Growing Up in Hollywood Town* (Sheffield Lab LAB 13) uncomfortably coincided with a top-panel resonance, this again adding a hooty quality and smearing the otherwise precisely maintained image of her voice. In general, however, I was surprised at how little effect these panel resonances had on the Parsec's ability to represent the musical values within a recording. Cello, for example, which has the bulk of its energy in the Parsec's problem region, seemed little affected, and hardly any tracks on the Astrée sampler CD (E7699), most of which feature light-toned baroque-era instruments, suffered from noticeable coloration. I can only conjecture that the placement of these resonant frequencies and their Q factors are such that, with the exception of the instances mentioned above, the kind of music that tends to excite them will also mask their effect to a large extent. Not all the time, however. With complex sounds having a good deal of midrange energy, choral music for example, the Parsec's presentation was occasionally less transparent, more confused, than I would have expected.

Putting tonal aspects to one side, the Parsec's imaging performance was generally excellent. Sound sources had a good degree of palpability, though those in the center of the image were a little wider in the lower midrange than they were in the treble, presumably due to the cabinet resonances "pulling" the imaging toward the speaker positions. Depth rendition was also good, the addition of reverberant information to the direct sounds of voices and instruments unambiguously moving them further back in the soundstage. The LEDR "Up" test on the Chesky Test CD (JD37) produced a reasonable sense of image height, though again there was a degree of instability, even with the speakers well away from room boundaries and obstacles, that was presumably cabinet-related.

Dynamically, the Parsecs would play very loud before a sense both of hardness in the treble and confusion in the midrange set in. With the Levinsons, 105dB spls could easily be reached. Jump factor was also good, there generally being a good deal of slam apparent in the sounds of percussion, though as noted earlier, timpani and similarly pitched tom-toms featured a rather hooty, "wooden"-sounding overhang which reduced the speaker's otherwise quite transparent presentation. Nevertheless, upon returning to Celestion SL700s, I was
struck by how undynamic they sounded by comparison with the Parsecs.

**Measurements**

The Parsec's plot of electrical impedance magnitude and phase is shown in fig.1: with a phase angle between +3° and -33° in the audio band and dropping below 7 ohms only in the mid-bass, it implies that the speaker will be an easy load for even inexpensive amplifiers to drive, especially with a measured sensitivity (with a 1/2-octave-wide 1kHz warble tone) of around 91dB/W/m (this somewhat higher than specification). The port tuning is indicated by the minimum at 22Hz and the tweeter "oil-can" resonance by the dimple at 25kHz. Note, however, the glitch just above 130Hz in both magnitude and phase plots; this indicates the presence of a serious cabinet resonance at this frequency.

To look at the cabinet behavior further, I placed the Parsecs facing each other, positioned as closely as possible, and drove them...
in antiphase with the MLSSA pseudo-white noise signal. In this way, nearly all the direct output of the speakers would be canceled, leaving the cabinet panels as the main radiating surfaces. I then placed the measuring microphone very close to each panel and calculated the impulse response of that panel with MLSSA. The resonance at 130Hz or so turned out to be due to the Parsec's back panel which, as noted during the auditioning, was extremely "live." Fig.2 shows the cumulative spectral-decay plot calculated from its impulse response (a 200ms, \( \frac{1}{2} \) of a second, time window is shown): both back and side panels could be felt to vibrate strongly between 60 and 90Hz, and a strong ridge can be seen centered on 65Hz. As this is also the frequency of the fundamental floor-to-ceiling mode in my listening room, it is possible that this has affected the measurement. Note instead the ridge at the cursor position, 133Hz, which indicates a strong panel resonance at this frequency. Feeding the speaker with a pure 133Hz sinewave tone revealed that the back panel did indeed vibrate very strongly!

As tapping the back panel at different places produced different "notes," I repeated this measurement at a point about 6" below the top of the cabinet. The resultant cumulative spectral-decay plot is shown in fig.3. Again, it is possible that the low-frequency resonances are room modes, but there is a series of strong resonances noticeable as ridges at 385, 280, 205, and 170Hz. (Close inspection of figs.2 and 3 reveals that all the resonances are present in both plots, but at different intensities at the different positions on the rear panel.) These were all frequencies at which this panel felt very lively with sinewave tones. The side panels were generally less live-sounding as judged by the knuckle-rap test; measurement proved this to be the case, though mild resonant modes at 135Hz, 205Hz, and 283Hz were found.

I went into this detailed analysis of the Parsec's cabinet resonances because of the large radiating area of the panels and the persistent colorations I noted on male voice, timpani, and piano to which they undoubtedly contributed. Their less-visible effect on other kinds of music I can only put down to the fact that as these resonances appear to be of reasonably high Q and therefore will need to be excited by a signal pretty much having the same frequency, only relatively sonically pure music having a strong content between 100Hz and 300Hz will be colored to any significant effect. In addition, as it was the rear panel that was most resonant and as this faces away from the listener, the subjective effects will be reduced in amplitude. Nevertheless, the presence of the higher-frequency cabinet modes might well have contributed to the subjective hardness noted at high playback levels and both to the occasional feeling of confusion in the lower midrange and the unevenness on treble piano notes.

Turning to the time domain, fig.4 shows the Parsec's impulse response captured on the midrange axis at a distance of 48". (The speaker was placed on a 36"-high table outside for this measurement, which gave a time window of more than 7ms before the first reflection of the sound, from the floor, reached the microphone. This means that the quasi-anechoic response derived from this impulse response will be accurate down to a frequency of approximately 150Hz. Because of noise from neighbors and traffic, eight separate measurements were averaged to produce the final curve shown.) This response, actually averaged across a ±15° lateral window, is shown to the right of fig.5. Impressively smooth through the midrange and treble, it is broken by a degree of prominence in the low mids and the top octave of treble, with a corresponding "saddle" in the low treble. As this latter range corresponds to the brightness region, this slight depression will correlate with the rather mellow treble featured by the Parsec.

Fig.6 shows how the Parsec's anechoic response changes as the listening height changes, these again derived from impulse responses taken outdoors. The curve at the bottom/front was taken on the port axis. This is an unrealistically low axis for listeners other than Snow White's seven companions, but the trace reveals that Dave Fokos has appropriately arranged the drive-unit phasing so that the inevitable cross-over cancellation notches are well away from the listening axis. The next curve was taken midway between the ports and the midrange unit, while the central curve is on the midrange axis, this some 36° off the floor, equating with my usual listening height. The next curve was taken on the tweeter axis, while the top/rear curve shows the response 15° above the cabinet top, representing the balance heard by a standing listener at the back of the listening.
room. This has an excess of midrange energy—remember that I found the speaker's balance on this axis to sound "squawky"—but apart from that, the Parsec should not be too finicky regarding listening height. Listening with your ears either level with the midrange axis or just above will give the smoothest balance, as noted in the auditioning.

The lefthand side of fig.5 shows the responses of the woofer and ports, measured in the nearfield. The woofer can be seen to peak up a little in the midbass, with then a reasonably slow rollout, reaching −6dB at a low 39Hz. Although not shown, repeating the nearfield measurement with the MLSSA system set to a bandwidth of 1kHz reveals the woofer to have a very clean spectral decay, with minimal resonant behavior apparent until well above its passband. The response of the ports is somewhat enigmatic, as although their apparent tuning of 20Hz agrees with the plotted impedance...
in fig.1, it rolls off much less smoothly than usual, with blips noticeable at 60Hz and 80Hz, these probably not coincidentally the third and fourth harmonics of the port tuning. A blip can also be seen at 133Hz, the rear-panel resonance frequency. The port’s output also rolls off more gradually than usual, being only 12dB down at 300Hz.

How the output of the ports, with their minimal radiating area, and that of the woofer integrate is hard to assess from the individual nearfield measurements, which is one reason why I carry out an in-room ½-octave measurement, spatially averaged across a 72"-wide window at the listening position to minimize the effects of room resonances. This is shown in fig.7 and was taken with the speakers at the original 5' distance from the side walls. As suspected from the auditioning and predicted by the nearfield curve in fig.5, there is a degree of mid- and upper-bass exaggeration in-room, perhaps due to the closeness of the floor boundary to the drive-unit. A generally sloping-down response from the upper bass to the midrange is also apparent. Note, however, the Parsec’s astonishingly smooth response throughout the upper midrange and treble. This is due both to the speaker’s intrinsically flat response in this region and its wide, even dispersion, and will contribute to the Parsec’s natural reproduction of treble instruments and voices. The slight rise in the high treble is presumably due to the tweeter’s increasingly narrow directivity in this region, while in the low bass, the ports reinforce the woofer output to give a –6dB point referenced to the level at 200Hz of 25Hz — excellent in-room bass extension if not flat to the port tuning frequency, this presumably due to the overdamped low-frequency alignment.

Finally, fig.8 shows the cumulative spectral-decay plot for the speaker on the midrange axis at 48", derived from the impulse response in fig.4 and featuring a frequency resolution of 90Hz or so. The tweeter resonance again can be seen at 25kHz; apart from that, the treble is pretty flat and clean, apart from a degree of liveliness noticeable around 3kHz and 5kHz, probably due to midrange-unit breakup modes. The cursor position shows that there is something peculiar happening around 1250Hz, there being a complicated pattern of a ridge broken by reflections at this frequency. This behavior might again correlate with my feeling of occasiona

sional hardness in the low treble at high levels and the propensity for some high piano notes to jump forward.

**Conclusion**

My exploration of the Parsec’s panel behavior illustrates how easy it is for reviewers to wander away from what is important with a component. You spot something with a measurement that inspires further measurement that in turn pins down a characteristic behavior that appears to correlate with something that was heard. Case closed. Except that it is then all too easy to forget that that description is at best partial and at worst irrelevant to the subjective experience.

Such is much the case with the Icon Parsec. Early on in the review I had convinced myself that the large panels of its cabinet were too lively and must therefore contribute something to the speaker’s sound. Yet record after record went on to the turntable, CD after CD on to the player, and with the exceptions noted earlier, I could hear little that indicated that the supposed panel problems were interfering with the music—even after I had established the presence of the enclosure resonances by measurement.

So much for the oft-repeated claim of “establishment” writers that “subjective reviewers only hear what they expect to hear.” To confirm that I was hearing/not hearing the Parsec’s measured cabinet problems, I invited Tom Norton over to take a listen. My experience has been that Tom has a better ear than mine when it comes to detecting midrange colorations—he also has very different musical tastes—but he too felt that the Parsecs were pretty uncolored throughout this frequency region. Only on timpani, male voice, and piano did he feel that the enclosure was making its presence noticeable, and then only to a minor degree much of the time.

To sum up the Parsec’s positive attributes, it is well-made, has one of the best treble balances I have experienced from a moving-coil loudspeaker, has an uncolored mid-to-upper midrange, plays loud, throws a well-defined soundstage, and has excellent low-bass extension. On the downside, its tonal balance is a little tipped up in the mid- and upper-bass,
though this will not be that important to listeners who play mainly rock music unless they have a room that is rather on the small side. More important, the Parsec's lively cabinet can add a hooty coloration to male voice and piano and can be heard smearing the sound of timps and low-pitched drums. Although I felt this to have a minor, music-dependent effect on the speaker's sound quality, it did add a degree of confusion to the midrange at high playback levels and possibly contributed to my feeling that the sound lacked transparency some of the time.

But even with that, I found myself liking my music a lot via the Parsecs. In my judgment, therefore, Icon's Parsec is excellent value for money at a hair under $1500/pair, offering a balance between good, solid musical sound and coloration levels in the midrange and above more typical of a dynamic loudspeaker costing up to twice that price. If you are looking for a reasonably moderately priced dynamic speaker with a generous proportion of bass and the ability to play loudly cleanly, try the Parsec out. You have nothing to lose considering the manufacturer's 30-day, money-back guarantee, and everything to gain in the way of hearing your music played with plenty of meat on its bones.

ESOTERIC P-2 CD TRANSPORT

Robert Harley


The whole idea that different CD transports have different sonic characteristics when driving the same digital to analog converter is a vexing problem. It is easy to prove that even the cheapest CD players recover the data stored on most CDs with bit-for-bit accuracy, thus disproving the widespread and erroneous belief that errors in the digital code are commonplace and affect presentation aspects such as imaging, soundstage depth, textural liquidity, etc. If the datastream driving the digital converter is comprised of the same sequence of ones and zeros,
regardless of the transport, what other factors could account for the sonic differences between CD drives reported by many listeners?

The argument that CD transports absolutely cannot affect the sonic character—proposed, I might add, by engineers who reject the idea on a strictly theoretical basis without ever listening—goes something like this:

"Bits is bits. If the ones and zeros are the same, there can be no difference in the analog output signal. Higher-precision drives and laser mechanisms make no difference because the system must distinguish between only a one and a zero. There are no intermediate values. Even if the signal recovered from the disc at the photodetector is cleaner and has less jitter (timing variations) with a better transport, it is irrelevant because that signal is squared, buffered, decoded, and clocked out of another buffer with quartz-crystal accuracy. Any timing variations are removed by the buffer, eliminating jitter from the list of the audiophile's sonic gremlins. Now, since the data are identical, and jitter is not a factor, what's left as a source of the difference? And even if there were some slight differences in the data stream, how could that affect something like soundstage depth? Those naïve audiophiles who believe such things don't realize that digital either works perfectly, or doesn't work at all: the variability associated with analog has been removed by digital's perfection. Your computer doesn't perform differently when you run a copy of a program rather than the original program disc."

This way of thinking was reflected in a recent Pro Sound News article about CD tweaks. Here are some quotes from engineers at CD manufacturing plants: "It's black magic" (Jim Boyer, American Helix). "Lasers read a straight binary code. That's zero and one every time. It doesn't matter what color the disc is, the laser still will not read one and a half. CDs are like typewriter keyboards. When you hit m, it always comes out m" (Scott Bartlett, Digital Audio Disc Corporation). "There's just no scientific credibility surrounding these activities" (Joe Robinson, Philips DuPont Optical). "It's a gimmick" (Dave Williams, Nimbus Records). However, one representative from Disctrionics, Ramin Ghadimi, did go way out on a limb and speculate that "The same CD may sound different in a different player." 2

During the past year, I've had some fascinating discussions with designers of well-respected high-end digital converters and CD players. Of particular interest to me is the question of how jitter and noise in the recovered HF signal could propagate through the buffers and decoding circuitry to affect the transport's S/PDIF output, much less the analog output signal. This interest was sparked by my experiences with the Esoteric P-2 transport. I heard a significant improvement in the musical presentation with the P-2 and, perhaps not coincidentally, measured much lower jitter in its HF signal than that measured in other transports. 3 None of the designers with whom I spoke knew the answer to how variations in the HF signal could possibly get through to affect the analog output, yet all heard differences when the HF signal was changed. The collective attitude was, "Our charter isn't to do basic research into these things. We don't have dozens of engineers to figure it out. Building good-sound products is our business, and if cleaning up the HF signal results in better sound, we're going to do it despite the lack of a theoretical basis." Many of these designers, I should add, have advanced engineering degrees. 4

This brings us to the Esoteric P-2 CD transport, a $4000 product that represents a complete rethinking of CD transport design. What are the musical effects of this radically different drive mechanism? How important is the transport to CD playback?

Technical description

The Esoteric P-2 is the matching transport to the D-2 digital converter reviewed in Vol.13 No.10 (along with Esoteric's two other converters). Priced at $4000, it represents the top of the Esoteric line that includes the $2000 D-10 and $1000 D-500 CD transports. It should

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1 See "CD: Jitter, Error, and Magic," Vol.13 No.5. The article also contains a description of how data are recovered from a CD, an understanding of which is helpful in the following discussion of the P-2.

2 See JA's sidebar to the Meridian 208 review this issue. His experiments in introducing jitter by computer simulation reveal a remarkably analog-like variability to the reproduced signal.

3 The HF signal is the raw signal reflected from the CD and picked up by the photodetector. It is comprised of nine discrete-frequency sine waves (196kHz to 720kHz) that correspond to the nine pit or land lengths encoded on the CD. Although the HF signal looks very analog, digital data are encoded in the zero crossing transitions.

4 Designers with whom I've had discussions include Kevin Burke and Steve Taylor (Madrigal), Edmund Meitner and Gregory Soo (Museteax), Mike Moffat (Theta Digital), Don Moses (Wadia Digital), and Bob Stuart (Meridian).
be noted that the $5595 Wadia WT-2000 CD transport is based on the P-2. Wadia buys the unit from Esoteric and fits it with Wadia's proprietary optical interface.

The P-2 is one of the most beautiful pieces of audio equipment I've seen, both aesthetically and in terms of build quality. It is solid, luxurious, and finely appointed. The front and top are anodized a dark champagne color, while the side panels are finished in 3M's Nextel, an unusual textured material. All exterior metal chassis parts (front and top) are made from very thick (18mm) and beautifully machined shaved aluminum. The metalwork is gorgeous and lavish, contributing to the P-2's overall elegance.

Rather than clutter the P-2's front-panel appearance, most of the transport functions are provided on the remote control. The only controls provided on the front panel are power on/off, drawer open/close, track skip, play, and pause. The panel's centerpiece is a very thin gold-plated drawer that recedes into the unit. The bulk of the drawer itself is Nextel: the gold-plated surface is on the outside edge visible when the drawer is closed. Below the drawer, an LED display panel provides the user with a variety of information, including track and index number, total or remaining time, and programmed play status.

Instead of incorporating the power transformer inside the chassis, it is mounted on the rear panel. Whether this was done for sonic reasons or space requirements, I don't know. The transformer does, however, increase the P-2's already substantial depth. The rear panel also holds an IEC line-cord jack and the four digital outputs. The two coaxial digital outputs are on gold-plated RCA jacks, while the two additional optical outputs are on standard EIAJ (TOSLINK) jacks.

Three small recessed knobs on the P-2's right side panel allow the user to adjust the front-panel display brightness and control the drawer's open and close speed.

The full-featured remote control supplied with the P-2 also controls the matching D-2 digital processor. Like the P-2's side panels, it is finished primarily in Nextel, with a champagne-colored top. The remote control's functions include open/close, track skip, index skip, search, play, stop, pause, display on/off, repeat, A-B, time search, time mode (elapsed or remaining), check (programmed playback contents), delete (programmed memory contents), direct track-access buttons, and track programming controls. When programming random play, the total programmed playback time is displayed, handy for making tapes. Other convenience features include time search, allowing the user to start the transport at any time specified within a track via the numeric keypad. The autospacing function creates a four-second pause between tracks. The P-2 is clearly a full-function machine.

Inside, the P-2's build quality mirrors the exterior's extraordinary construction. When looking at the P-2's mechanism and electronics, one sees the precision and craftsmanship of a fine Swiss watch.

The heart of the P-2 is the drive mechanism, which is radically different from conventional transports and is proprietary to Esoteric. It is called VRDS, or Vibration-Free Rigid Disc-Clamping System. As can be seen in fig.1, rather than holding the disc at the center hole, the P-2
firmly clamps the CD over its entire surface area to a zinc turntable slightly larger than the CD. This reportedly reduces surface vibrations, improving the precision with which the data are read. In addition, the turntable is slightly concave, correcting any warping or eccentricity of the disc. The laser is adjusted to the disc’s slightly concave surface so the beam always stays perpendicular to the disc surface.

Besides reducing vibration, the turntable/disc’s stability as rendered by this mechanism is said to reduce servo current demands. A slightly warped disc on a conventional transport results in the reflection of the laser beam at a deflected angle, greatly increasing radial servo activity. Indeed, disc flatness is often specified by the maximum radial tracking voltage allowable (typically 250mV RMS after filtering and processing). The Esoteric P-2 mechanism also eliminates eccentricity, an out-of-round condition analogous to a misplaced center hole in an LP. Just as the tonearm must swing back and forth to follow the eccentric LP groove, the CD mechanism’s radial tracking servo must drive the laser sled back and forth to follow the eccentric track of pits. Eccentricity in a CD is introduced by a misplaced center hole, with the maximum allowable deviation 0.4mm.

One potential source of problems in many CD players is the fact that the focus and tracking servo signals, with their large fluctuating currents, are carried in a thin ribbon cable along with the HF signal, possibly corrupting it. In fact, I believe that many mechanical CD tweaks like rings improve the sound by reducing servo current demands, especially in players with poor isolation or marginal power supplies. It should be noted that the P-2’s clamping mechanism precludes using additional damper discs, rings, or any other device that changes the CD’s size or shape. Presumably, the P-2’s mechanism obviates the need for additional stabilizing tweaks.

The zinc turntable is designed to have a low resonant frequency and high vibration-damping characteristics. Because the turntable is so heavy, a special motor was developed employing samarium-cobalt magnets instead of standard ferrite magnets. This motor is mounted on a diecast aluminum bridge assembly that straddles the turntable and drawer sled. Because of space constraints, rotational drive motors are typically mounted beneath the turntable next to the laser head rather than above the rotating mechanism. The drive system’s mechanical rigidity is thus compromised in conventional designs. By positioning the motor and mount assembly above the turntable and away from the laser sled, Esoteric engineers were given the freedom to make the drive system as rigid and as large as was felt necessary. Finally, the entire motor/support system is mounted to a massive 1kg (2.2 lbs) diecast zinc base.

The attention paid to making the P-2 mechanically rigid is extraordinary. Even the chassis and front panel were designed to increase the P-2’s vibration resistance. What effect this will have on the recovered HF signal and, more important, on musical reproduction, are interesting questions. There is no doubt, however, that the HF signal recovered from a disc on the P-2 has substantially lower jitter than when recovered on a standard Philips CDM1 Mk.2. During my investigation of CD tweaks on error rates and jitter mentioned earlier, I used a Kenwood jitter analyzer to measure the possible effects of different CD treatments. The Kenwood analyzer measures the period of 13 (the shortest pit or land length on a disc, which should ideally be 694ns) and displays the distribution (typically Gaussian) around this value. Although the study didn’t include transports, I measured the P-2’s jitter out of curiosity just before I had to return the analyzer. The difference between the P-2 and a standard transport was startling.

I had set the analyzer to display the percentage of 13 values that fell outside a <50ns window around the ideal value of 694ns. With the Philips transport in a Magnavox player, 78% of the recovered 13 periods fell outside this window. With the P-2 (and the same disc), only 28% of the 13 periods deviated more than <50ns from the ideal value. Note that this jitter is in the raw signal recovered from the disc before being relocked out of the FIFO (First In, First Out) buffer and will be very great due to rotational speed variations in both the CD mastering machine and the player drive mechanism. This large amount of jitter (tens of nanoseconds) in the raw HF signal is contrasted with the relatively small amounts of jitter (hundreds of picoseconds) in the clock signal at the converter that still creates sidebands and noise as described in JA’s Meridian 208 review in this issue.5

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The P-2's power supply is on an upside- down pcb about 7" square mounted at the top rear of the unit. It is enormous and elaborate for a CD transport. The board is populated by large (4700µF and 6800µF) electrolytic caps, many smaller electrolytics, two full-wave bridge rectifiers, high-power transistors, and five three-pin (TO-220) voltage regulators. This power supply is extraordinary for a CD transport. It is difficult to imagine any servo-system interaction through the power supply in the P-2.

Lying on the chassis bottom beneath the transport mechanism, a large pcb holds an extensive array of chips and a few discrete components. I've never seen so much circuitry associated with a CD transport. This board provides the servo systems, decoding, error correction, formatting, and control/display functions.

To sum up, the Esoteric P-2 is innovative in design and elaborate and lavish in execution. The unique disc-clamping mechanism, tank-like construction, and elaborate power supply confirm that the P-2 is a no-holds-barred attempt at a state-of-the-art transport. In addition, the P-2's beautiful styling and extraordinary fit and finish place it among the most luxurious and elegant of audio components.

But is the P-2 just a $4000 piece of audio jewelry, or does it significantly improve the musical experience from CD playback over less ambitious designs?

Listening

I've been listening to the Esoteric P-2 for about six months with a variety of digital processors. My current reference system is comprised of Hales System Two Signature loudspeakers driven by VTL 225W Deluxe monoblocks via 3' runs of bi-wired AudioQuest Clear. Digital processors auditioned with the P-2 included the VTL tubed unit reviewed in this issue, Stax DAC-Xlt, Theta DSP Basic, and Proceed PDP. Other digital processors used with the P-2 in the past few months include the Melior Digital Center, Aragon D2A, Esoteric D-2, D-10, and D-500, Wadia 2000, and Wadia X-32.

Rather than use an active preamp, the digital processors' respective outputs were attenuated with an Electronic Visionary Systems Stepped Attenuator, which puts only two resistors and a switch in the signal path. All interconnects (digital processor to Stepped Attenuator, Stepped Attenuator to VTLs) were the extraordinary Expressive Technologies IC-1.

I've been experimenting with different digital interconnects and had a variety at my disposal, including the Aural Symphonics Digital Transmission Line, one from The Anodyne Group, a JVC coaxial cable, and an Audio-Technica premium optical interconnect. I also had DAT master tapes from which CDs were made (Stereophile's Poem and a jazz album I engineered) for comparisons between CD playback from the Esoteric and DAT playback from the JVC DAT machine driving the same digital converter. Finally, I compared the P-2 with the digital output of the $400 Rotel RCD-855, thus comparing an inexpensive CD player transport to an ambitious dedicated unit. Although this may seem like an unfair comparison, it nevertheless answers the question "What effect does a CD transport have on the musical presentation?"

My dedicated listening room has dimensional ratios chosen for room-mode distribution, with a high sloped ceiling. All AC power (except the VTL monoblock amplifiers) was conditioned with a Tice Power Block and Titan Energy Storage System.

I began by comparing the P-2's digital output with the Rotel RCD-855, decoded by the Stax DAC-Xlt digital converter. Identical lengths of Aural Symphonics Digital Transmission Line cable connected the P-2 and Rotel to the Stax. The multiple-input Stax allows direct comparison of two digital sources by selecting a different input. In this situation, all variables are removed (playback level, impedance matching, polarity inversion, cables, etc.) except the transports under audition. Since I had become accustomed to the P-2 from six months of exclusive listening, switching transports for the first time for this review threw into sharp relief the differences between a state-of-the-art transport and a typical inexpensive mechanism found in many CD players. (Note that all references to the Rotel RCD-855 in this review are to it used as a transport only.)

Every aspect of the presentation changed for the better through the P-2. Although the difference was quite apparent, it was far less than the difference between, say, a good digital proces-

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sor and the Stax DAC-X1t or VTL D/A. In conversations with audiophiles, I've noticed a belief that the transport has as much, or greater, influence on the reproduced sound than the digital to analog converter. I strongly disagree with this contention. A good transport is essential to realizing the best digital playback, but the overall system performance is much more dependent on the D/A converter. A $1000 transport with a $4000 digital converter makes more sense than a $4000 transport driving a $1000 digital processor.

Nevertheless, music from CDs recovered by the P-2 is more analog-like than from other transports I’ve tried. This is perhaps the highest compliment one can pay any digital product. The presentation took on a sense of ease and relaxation, with less strain and fatigue. This perception could be the result of the P-2’s ability to present instrumental textures with a liquidity and roundness not heard through lesser transports. Instruments and vocals bloomed within the soundstage with a natural texture that gave them a realism and palpability. For example, listen to Dianne Reeves’s vocal on David Benoit’s This Side Up CD (En Pointe ENP 0001). This vocal track, recorded with a tube microphone live to 2-track, is particularly revealing of changes in a component’s presentation. When reproduced through the P-2, it had a warm, rich bloom that made it seem to exist in space between the loudspeakers. Its complex, finely woven texture was engaging, drawing the listener into the performance. When playing the same track through the Rotel RCD-855 used as a transport (again decoded by the Stax DAC-X1t), the vocal became a little less round and more two-dimensional. It seemed to shrink in the depth axis, imparting what JA vividly describes as a “cardboard cutout” perspective to the image. In addition to losing this bloom, the image tended to become homogenized with the other instruments. The feeling of the image surrounded by air, spatially distinct and existing independently in front of the loudspeakers, was reduced. There was less apparent reverberation, rendering the presentation drier, more sterile. The reverberation seemed slightly truncated as the RCD-855 failed to resolve the low-level information that provides the listener with that last bit of reverberation decay.

In addition, Reeves’s voice lost some of the fine structure and detail that made it so compelling through the P-2. The subtle tonal shading and harmonic detail that give her voice so much character were less apparent from the RCD-855. The analogy of fabric comes to mind: through the P-2, her voice was like finely woven silk; through the RCD-855’s transport it was more like burlap. This analogy is a gross exaggeration of the differences, but does convey the essence of my impressions.

These perceptions were duplicated with each disc I played, with different music revealing different aspects of the CD transport’s effect on the musical presentation. When comparing the RCD-855’s transport with the P-2 with Dick Hyman Plays Fats Waller (Reference Recordings RR-33CD), recorded direct-to-CD, I immediately had the impression that the soundstage was narrower through the RCD-855. It didn’t take long to realize, however, that this perception was not due to a difference in the spatial position of the piano. Instead, the P-2 presented an apparently wider soundstage by allowing the Stax to resolve an aura of ambience, space, air, and reverberation around the instrument not heard from the RCD-855’s transport. Through the P-2, the piano existed between the loudspeakers, surrounded by room reflections which gave the feeling of a wider soundstage. Fed by the RCD-855, the Stax failed to resolve these ambience cues (created with great thought and effort by engineer Keith Johnson) that add so much to the recording.

In addition, there was more inner instrumental detail through the P-2, making it easier to distinguish left- and right-hand lines, especially during complex passages. It was as though the instrument’s inner detail came to the listener without effort when reproduced by the P-2, rather than the listener straining to hear fine detail. Additionally, the sound of the hammers striking the strings was affected by the transport. The RCD-855 tended to introduce a slightly metallic, or brittle character to the attack, while the P-2 was softer and more gentle. Finally, the P-2 sounded more natural harmonically, with less grain, more liquid textures, and an overall greater feeling of ease. Of all these impressions of the P-2’s effect on the musical presentation, the most salient were the apparently wider soundstage, greater resolution of spatial cues and air around the instrument, and the lack of hardness in the hammers’ attack. Ironically, the same description of the P-2’s presentation in relation to the inexpensive
transport could be used to describe the differences between analog and digital.

Intrigued by the P-2's greater resolution of spatial information, I turned to Three-Way Mirror (Reference Recordings RR-24CD), a recording with a wealth of spatial detail and nuance (also recorded, not coincidentally, by Keith Johnson). The P-2's superior ability to portray space was even more apparent. Besides producing a greater overall feeling of presentation size, specific instruments took on different spatial perspectives through the different transports. For example, at the end of the first track, the eschete (a percussion instrument) recedes into the distance over the repeated acoustic fretless-bass figure. Through the RCD-855, it begins to acquire more reflected and less direct components, making it appear to move away from the listener as it picks up space, then stops. Through the P-2, it recedes much farther into the soundstage, with many more gradations of apparent distance. I should add that one's ability to hear differences in low-level cues like the ones described improves as listening level increases. This phenomenon occurs in the recording studio when mixing: the louder the monitoring level, the less reverberation the engineer tends to add, making the recording sound dry at low playback levels. The reverberation seems to end when it drops in level below the ambient noise floor. Consequently, a higher playback level raises the point at which the reverberation is lost in the noise floor. Fortunately, my listening room is in a very quiet, rural location, putting the ambient noise floor below these very low-amplitude components. At low playback levels in a noisier environment, the differences in spatial presentation between transports will tend to be diminished.

I repeated the listening, this time comparing the P-2 with the digital output of a Marantz CD-94. The same differences were apparent, but to a lesser extent. In fact, the CD-94, which uses the best Philips drive, was quite a bit better than the Rotel RCD-855. The CD-94's presentation didn't match the P-2's, but did offer very musical performance. Listening to my own jazz recording, the CD-94 was detailed and transparent, but with slightly hard textures. The treble seemed brighter and the presentation more forward than through the P-2. Although the CD-94 had more bloom than the Rotel, the P-2 was in a different league in this regard.

Why the P-2 sounds better is a mystery. What is different about the P-2's datastream, appearing on the digital-out RCA jack, that could affect textural liquidity, spatial resolution, and overall musicality? One can point to the P-2's innovative and exacting design aspects such as the massive power supply that isolates subsystems, the extraordinary vibration-reducing disc-clamping mechanism that improves the HF signal and eliminates the effects of disc eccentricity and warp on servo current demands, and the sophisticated control electronics. The bottom line, however, is that the P-2's S/PDIF output must be different from other transports' digital outputs. But in what way? And how does a change in the datastream cause an analog-like variability in the musical presentation? I think it is no coincidence that the P-2 exhibits much lower measured HF signal jitter than common transports.

Conclusion
The Esoteric P-2 CD transport clearly offers superior sonic performance over conventional CD drive mechanisms. Its presentation tended to make digital playback closer to analog in many respects: more liquid textures, greater resolution of spatial detail, increased soundstage transparency, and more natural timbral shadings. Apart from these specific areas, listening to music through the P-2 was more involving, engaging, and enjoyable. The presentation took on a relaxed, unstrained feeling that made it easier to concentrate on the music and forget about the playback system.

The Esoteric P-2 is innovative in design and extraordinary in execution. It represents a complete rethink of what a CD transport should do. The drive mechanism in particular addresses aspects of CD data retrieval either ignored or considered insignificant by other manufacturers. In addition to being a technical tour de force, the P-2 is a joy to use ergonomically, lavish in build quality, and elegant in appearance.

Very often, comparing the musical merits of two components results in ambivalent feelings: component A does this better, but component B does that better. With the Esoteric P-2, there were no such tradeoffs: every aspect of the presentation was superior, resulting in a greater intimacy with the music. These comparisons with conventional CD drives revealed just what a good transport will do for digital playback. This is perhaps the beginning of our explora...
tions into CD drives: I am eager to find out how the P-2 compares with other high-end transports such as the Krell MD-1 ($5400), Krell MD-2 ($2700), or Wadia WT-2000 ($5595). Equally important, I would like to find a drive that offers similar performance upgrades at a lower price. The $2000 Esoteric D-10 uses a nearly identical mechanism to the P-2 and may have sonic performance close to its more expensive brother, but with a more cost-effective build. Watch for a review soon.

The Esoteric P-2 is a landmark product, making a strong case for the importance of the CD drive in achieving the best in digital playback. While the transport is a far less important factor in a system's overall performance than, say, a D/A converter, a good transport like the P-2 is nevertheless essential in a demanding high-end system. Give the P-2 a listen. Your ideas about CD transports may never be the same.

VACUUM TUBE LOGIC
DIGITAL TO ANALOGUE CONVERTER

Robert Harley


I find it more than a little ironic that in 1990 the only two digital-to-analog converters to employ a new state-of-the-art DAC also use vacuum tubes. Many in the audio community consider tubes an anachronism, and find it surprising and humorous that they are still used in newly designed audio products. The fact remains, however, that these two tubed digital processors achieve the best digital playback currently available—and by a wide margin. Moreover, their respective designers’ technical savvy and passion for building leading-edge products is reflected in their choice of these superlative and very expensive new DACs. Is it mere coincidence that both designers also chose vacuum tubes to realize their vision of no-compromise digital playback?

The two converters to which I refer are the extraordinary $12,000 Stax DAC-Xlt Vacuum Tube Output Reference D/A Processor reviewed in Vol.13 No.8, and the new $7000 Vacuum Tube Logic Digital to Analogue (sic) Converter reviewed here. The two processors are distinguished not only by their use of vacuum tubes, but also by their inclusion of the UltraAnalog DAC modules, devices that redefine what can be expected (both musically and technically) from digital to analog converters.1

Despite the outward similarities between the Stax DAC-Xlt and the VTL DAC, they are substantively different in design. First, the UltraAnalog DACs in the VTL are custom-made to VTL’s specifications, with more signal processing done outside the module with tubes. Second, the tubes in the VTL assume more functions (de-emphasis, analog low-pass filter, gain) than the Stax’s cathode-follower output buffer. However, the VTL is much less tweaky and more modest in build quality. You may remember the Stax used three AC power cords; Ohno Continuous Crystal (OCC) copper throughout, from transformer windings to pcb traces; lead-

1 The UltraAnalog DACs (and ADCs) represent the state of the art in D/A conversion. The modules, a combination of monolithic and discrete devices, undergo rigorous calibration during manufacture. They are also very expensive, about 20 times the price of a Philips TDA1541, Burr-Brown PCM64, or Analog Devices ADI8600. For a complete technical description of the UltraAnalog DACs, as well as a discussion of R-2R ladder conversion, see my review of the Stax DAC-Xlt in Vol.13 No.8.
less resistors soldered to the pcb top; and massive power supplies; all in a gorgeous and luxurious chassis.

In my review of the Stax, I concluded that it was significantly superior in musical (and technical) performance than any existing digital converter. Indeed, many digital processor designers hold the DAC-XI as the benchmark against which their efforts are measured. Does the VTL D/A, priced $5000 less than the Stax, represent a serious challenge to the Stax's reign as the best digital playback currently attainable?

Technical description

The VTL D/A converter is a slim, 19"-wide unit with rack-mount holes in the front panel. Although well made, it embodies a no-frills design philosophy that places sonic performance above user convenience and styling elegance. The front panel and chassis are machined from aluminum and screwed together, rather than the less expensive and commonly used bent sheet metal. The side panels and a border around the front panel are anodized red, while the top, rear, and bottom are black. The hand-machined metalwork is excellent, with a nice bevel to the front panels' edges.

The front panel holds three toggle switches and four red LEDs. A power on/off switch is located to the far right-hand side, with the power-on indicator appearing at the panel's center. At the far left, a row of three LEDs indicates the incoming digital signal's sampling rate: 32kHz, 44.1kHz, or 48kHz. Next to these LEDs, a polarity inversion switch marked "90" (up) and "180" (down) allows the user to invert absolute polarity (in the digital domain). The third toggle switch selects one of the converter's digital inputs.

Moving to the rear panel, three digital inputs are provided on gold-plated RCA jacks, and three parallel UHF jacks are located just above the RCAs. UHF jacks are found primarily on older Tektronix oscilloscopes: this is the first time I've seen them an a piece of audio equipment. VTL supplies a UHF to BNC adapter with the processor for those applications where the digital source appears on a BNC jack. (The Wadia transports, for example, use BNC outputs.) Note that no optical inputs are provided. In the rear panel's center, a pair of XLR connectors are mounted above a pair of RCA jacks. Balanced operation (via a transformer) is available in the professional version of the converter (in conjunction with other professional features like AES/EBU input), which adds $2000 to the consumer price of $7000. In converters equipped with the balanced option, a small toggle switch selects between the balanced or unbalanced output pairs. The consumer version does come with the XLR jacks wired (pin 3 hot), but in an unbalanced configuration. An IEC line-cord jack and fuse holder finish off the rear panel.

Removing the top cover revealed the VTL's construction and layout. The right-hand third of the unit is dedicated to the power supply, with a thick aluminum shield isolating it from neighboring circuitry. A pcb holding four 6201 tubes lies horizontally next to the power-supply shield. Vents in the chassis top and bottom panels provide tube ventilation. The remaining half of the chassis is filled by a large pcb that contains the digital circuitry, some power-supply regulation, and the very large UltraAnalog DAC modules. Unlike most IC DACs that are fairly small, the UltraAnalog units are 2" by 3", consuming a sizeable portion of the board's real estate. The ubiquitous Yamaha YM3623B decodes the incoming S/PDIF signal, and an NPC SM5813APT performs the 8x-oversampling digital filtering.

Looking at the VTL's topology in more detail, the power supply is comprised of four transformers and four full-wave bridge rectifiers driving a total of eight independent power supplies. Five supplies, each with their own three-pin voltage regulator, are located on the DAC board and supply the DACs and logic circuits. The other three supplies serve the tube circuits, which share common heater and high-voltage supplies. The high-voltage supply filtering includes eight 68μF, 450V electrolytic capacitors.

The VTL converter uses two 6201 dual triodes per channel, which is a military version of the 12AT7WA. The four triode elements per channel provide gain after the DAC, perform active de-emphasis, and form an ultra-low-impedance totem-pole cathode-follower output driver. One of the 6201s is also used in the fourth-order Chebyshev anti-imaging filter, of which two poles are passive, two active.

Gain is required after the DAC because of the custom nature of the UltraAnalog parts used in the VTL converter. A stock UltraAnalog DAC D20400 (as used in the Stax DAC-XI) puts out 5V at full level, provided by an op-amp internal to the D20400. Rather than use an op-amp for
signal gain, VTL designer David Manley specified that the op-amp be removed so he could provide gain with a tube instead. The 0.5V output of the customized DAC is then amplified by one of the 6Z01 triodes. In addition to removing the op-amp, other changes were made to the D20400 that are exclusive and proprietary to VTL. These include making the part single-channel rather than dual-channel, and using the additional space inside the module to use larger, upgraded passive components. This modified version of the D20400 carries the VTL name and logo.

An interesting aspect of the VTL's design is the attention paid to reducing jitter in the recovered clock signal. Since the S/PDIF interface (a transport or DAT machine digital output signal) incorporates left- and right-channel audio data along with the clock signal in the same conductor, the outboard digital processor must generate a new clock with a Phase Locked Loop (PLL) based on the incoming clock frequency. In a standard implementation of the Yamaha YM3623B S/PDIF receiver chip, between 4 and 5 nanoseconds of clock jitter are introduced, increasing the noise floor and adding inharmonic information in the form of sidebands as well as intermodulation products of those sidebands. The VTL D/A uses a proprietary jitter-reduction circuit to reduce clock jitter and thus improve the unit's sonic performance. For a further discussion of jitter's effects, see JA's sidebar to his Meridian 208 review elsewhere in this issue.

The entire design is dual-mono, from power supply to analog output. Passive component quality is quite high, with polystyrene caps used throughout and many metal-film resistors. Four optocouplers, two per channel, switch in the de-emphasis circuit. It should be noted that these optocouplers are not in series with the signal path. The polarity inversion is performed in the digital domain by inverting the bit-stream's polarity. No output muting relay is used, resulting in a very unpleasant burst of noise under the following conditions: when the input selector switch is thrown; if the unit loses lock with the incoming data (as would happen when disconnecting or turning off the digital source); or if the VTL's power is turned off. Digital converters typically have several relays (output muting, de-emphasis switching), but David Manley feels they compromise the sonic quality as well as long-term reliability. I found, however, that the lack of a muting relay was a serious shortcoming when more than one digital input was connected and it was necessary to switch between them. When comparing transports or alternating between DAT and CD sources, I avoided the problem by selecting a different input on the passive Stepped Attenuator. This liability was mitigated after I got into the habit of de-selecting the VTL's output, but the learning curve's beginning was quite unpleasant.

Overall, the VTL Digital to Analogue Converter is well-built and typically VTL: an emphasis on the primary design aspects that affect sound quality rather than peripheral or esoteric aspects. These latter considerations, espoused by some highly regarded digital designers, include massive ground planes, Teflon pcbs, digital circuit shielding, no signal-carrying pcb traces longer than 2", consideration of air convection currents within the chassis, sonic effects of voltage-regulator style (can or TO-200 package), necessity of having a chassis machined from a solid block of aluminum, and effects of AC line-cord copper purity, to name a few. By contrast, VTL put its design effort into the heart of any D/A converter: the DAC and subsequent analog electronics. This is reflected in the extensive work that went into upgrading the UltraAnalog D20400 (already an exceptional device), to the point that it is became proprietary to VTL, as well as the analog section realized entirely with vacuum tubes.

Listening
I was particularly eager to audition the VTL converter for several reasons. First, I wanted to hear the UltraAnalog DACs in a design other than the extraordinary and expensive Stax DAC-Xlt. The DAC-Xlt provided a qualitatively different musical experience from digital playback, and I wondered if its superb performance was due primarily to the previously unheard UltraAnalog DACs, or to its no-compromise build. Second, I am quite enthusiastic about other VTL products, especially my reference amplifiers, the 225W Deluxe monoblocks. Could the VTL converter equal or better the $5000-more-expensive Stax?

The VTL D/A converter was auditioned in my usual reference system: Hales System Two Signatures driven by VTL 225W Deluxe mono-
blocks via 3' runs of bi-wired AudioQuest Clear cable. Level control and matching between processors under audition were through the Electronic Visionary Systems Stepped Attenuator, while interconnects were Expressive Technologies IC-1 (Stepped Attenuator to power amplifiers) and Music Metre (processors to Stepped Attenuator). The VTL was driven by the Esoteric P-2 CD transport (reviewed in this issue) and with a 48kHz signal from a JVC DAT machine playing my own master tapes. Digital interconnect was the Aural Symphonics Digital Transmission Line. All AC power (except to the VTL power amplifiers) was conditioned by a Tice Power Block and Titan Energy Storage System. My dedicated listening room's dimensions were chosen for best modal distribution.

I had not heard the Stax DAC-X1t in my system for several months after completing the review. It found a temporary home in Larry Archibald's system, LA feeling that it was the only converter worth listening to digital through. (Ah, the advantages of being the magazine's publisher.) At any rate, I had become used to listening to the Theta DSPro Basic as my reference digital playback. As I heard the first few seconds of music through the VTL D/A converter, I immediately felt a shock of recognition: the VTL sounded very close to what I remembered the Stax sounding like. These two converters are significantly different in their musical presentations from any other digital processors I've heard, and bear many remarkable sonic resemblances.

First, the presentation through the VTL was very "un-digital." No glare, no graininess, no hard textures, yet significantly, no "tubey" sound that achieves smoothness at the expense of musical detail. The presentation took on a very analog-like ease and liquidity that was like climbing into a hot tub on a cold day. The music flowed with a relaxation and comfort not often associated with digital playback. Instrumental textures were smooth and velvety yet finely woven and highly detailed, creating the sense of ease noted, while simultaneously riveting the listener to the performance with the abundance of detail and musical nuance. It is just this ability to deliver these two often mutually exclusive qualities that puts the VTL and the Stax in a league by themselves. More on this later.

The treble was exquisitely smooth and free of edge. Cymbals had more of the delicate quality of brass being struck, with their harmonic structure intact, rather than sounding superimposed on a layer of whitish grunge. The treble grain that often obscures musical detail in CD playback was noticeably absent, allowing the listener to hear the wealth of nuance at the lowest level of presentation. Similarly, sibilance was not spitty and annoying, as it often tends to be from CD. Instruments' high-frequency harmonic characters seemed natural, utterly free from stridency or edge. The brittle quality often heard from CD that imparts a metallic hardness to treble reproduction was utterly absent in the VTL. In fact, the VTL achieved the most natural timbral rendering of any digital processor I've heard. Compared with most other processors—including the Stax DAC-X1t—the VTL's treble was more laid-back and polite. The Stax tended to be a little more analytical, presenting treble detail with greater contrast. For example, the harpsichord in the "Suite in F" from Handel's Water Music (Harmonia Mundi HMU 907010) assumed a more forward position in the soundstage, increasing its musical contribution to the work when reproduced by the Stax. Conversely, the harpsichord was more subtle and less etched through the VTL. Although the VTL's presentation was soft, sweet, and mellow, it was never overly romantic or syrupy. Instead, I heard an abundance of detail, coupled with resolution of fine textures, that belied its relaxed presentation. I've found that other smooth-sounding digital processors—the Melior Digital Center reviewed last month, for example—tend to obscure musical nuances and low-level information.

Interestingly, my impressions of the VTL D/A's rendering of detail was remarkably similar to my feelings about the VTL 225W Deluxe monoblocks I reviewed last January (Vol.13 No.1), and which subsequently became my reference amplifiers. I wrote: "Instead of having detail thrust at the listener, I had to 'lean into' the music to hear it. The latter was a more rewarding experience: I felt drawn into, and intimate with, the performance instead of listening from a distance." This is exactly how I felt about the VTL D/A: the presentation of detail didn't keep me at arm's length from the music.

On most recordings I preferred the VTL's presentation of treble textures and rendering of detail to that of the Stax. On a few less-than-bright recordings, or those lacking detail, I felt
the VTL had less air and life than the Stax. Overall, however, I think the VTL is closer to live music in this regard. Both processors, though, are far better at resolving musical nuances than any other units I’ve heard.

It is just this fine and delicate nuance that makes music so much more interesting, compelling, and immediate. I believe that this is a major reason that digital often sounds less involving than analog. Listening to digital reproduction in isolation may give the impression that nothing is overtly wrong, but it fails to achieve an intimacy with the listener. However, if an analog reproduction of the same music is heard in comparison, the digital’s loss of low-level information is striking.³

However, the VTL D/A (and the Stax) have made a quantum leap forward in bridging this gap. Both these processors achieve an unprecedented level of performance in resolving minute detail. I am surprised by the fact that as D/A converters make huge leaps in performance—giving the listener a more powerful microscope, if you will—they reveal more and more musical detail in existing CDs, despite the fact that nearly all CDs have been encoded with low-resolution A/D converters.

The VTL’s midrange performance was similarly impressive, with smooth, velvety textures. There was also a nice sense of bloom around instruments not even approached by any processor except the Stax. My impressions of the VTL’s smooth treble textures and presentation of detail apply equally to the midrange. Lead instruments and voice tended to be slightly recessed in the soundstage, and with soft textures. Scott Kreitzer’s tenor sax, on his Kick ‘n Off album (Cexton CR11264), was laid-back, effortless, and had a texture that can only be described as luscious. It had a warm roundness, yet with a rich breathy quality, that pulled the listener into the performance. I attribute this impression to the VTL’s complete lack of glare and hardness through the midrange and treble. Again, the Stax tended to present a more vivid, forward, and immediate rendering, with a slightly etched character.

I found the VTL’s soundstaging abilities to be extraordinary, rivaled only by the Stax’s. The feeling of instrumental images existing in three-dimensional space, each surrounded by a cushion of air, was remarkable. The VTL’s presentation was the antithesis of flat, cardboard sterility. Some instrumental outlines were clearly heard behind others, conveying a convincing illusion of depth. Although image outlines were not bloated or frequency-dependent, they did tend to be slightly blurred and indistinct around the edges in comparison with the Stax. This created the effect of homogenizing images with each other, making an individual instrument harder to isolate in the presentation. This was especially evident on acoustic duets. For example, Julianne Baird’s voice was slightly melded with the lute on The English Lute Song (Dorian DOR-90109). There was not the sense of each instrument existing independently in space heard through the Stax. Similarly, there was less differentiation between Baird’s voice and the natural reverberation of the hall. Through the Stax, the hall reflections could clearly be heard behind and around her voice. It was also more difficult to isolate an individual instrument and hear it on its own through the VTL. The vibes, for example, in Jazz at the Pawnshop (Proprius PRCD-7778) tended to be slightly obscured and indistinct when comparing. Through the Stax, the vibes’ sharply defined outlines tended to allow them to exist independently of the other instruments without congestion. This contributed to the Stax’s slightly better sense of soundstage depth. In addition, I felt the Stax had a slightly wider soundstage than the VTL. Although both processors achieve unparalleled soundstage transparency, the nod goes to the Stax for its better resolution of image outlines. However, I felt that the VTL resolved low-level cues better than any processor I’ve heard.

I must stress that in these descriptions of the VTL’s presentation and performance in relation to the Stax, one should keep in mind that the differences between these two extraordinary processors are more subtle than the differences between them and all other processors I’ve auditioned. They are both, in my opinion, significantly better than other Class A contenders.

Moving to low-frequency reproduction, I found the VTL’s bass to be rounder and warmer than that of many other processors, including

³ Sheffield Lab recorded some of their later projects digitally for the CD release simultaneously with the direct-to-disc LP lacquer cutting. I have both the CD and direct-to-disc LP (in mint condition) of James Newton Howard and Friends (CD24). The comparison is striking. The difference is made all the more apparent by the fact that the LP signal was never stored on analog tape.

Similarly, all Reference Recordings projects are recorded simultaneously on digital and analog tape, with the digital master providing the source for the CD release, the analog master creating the LP.
the Stax. Pitch definition was less precise through the VTL, lacking the trampoline-like tautness heard from the Stax. The lowermost component of bass drum was lacking a little meat and dynamic impact through the VTL.

Although I feel that the Stax errs in the direction of being overly lean and dry in the bass (noted in my original review), the VTL is a little on the warm side of reality. However, one could argue that the Stax is overly analytical in the bass, while the VTL has bloom and musicality. Some listeners may find the VTL's low-frequency presentation more satisfying, despite the less articulate rendering.

**Measurements**

The VTL's output level when decoding a 0dB, 1kHz signal was 3.26V (left channel) and 3.22V (right channel). This is 4.2dB higher than the standard 2V output for a full-scale signal. Frequency response was flat (fig.1), down just 0.2dB at 20kHz. Note also that the right channel is about 0.1dB lower in level than the left. Fig.2 shows the VTL's de-emphasis error. This plot is actually the decoder's frequency response when playing an emphasized test signal, but since the VTL's frequency response was flat, this graph represents only errors in the VTL's de-emphasis curve. The sharp corners in the trace are a result of the measurement being taken at five discrete frequencies (125Hz, 1kHz, 4kHz, 10kHz, 16kHz) rather than with a swept sinewave as is frequency response. At any rate, this is the worst de-emphasis error I have measured in a CD player or digital processor. Typically, digital decoders with some de-emphasis error exhibit a few tenths of a dB deviation. The VTL's error was +0.5dB at 3kHz and worsened to +1.5dB at 16kHz. This will make pre-emphasized discs sound bright or fizzy. The fact that both channels have the identical error indicates that component tolerances are probably not responsible.

Looking at the spectral content of the VTL when decoding a dithered -90.31dB, 1kHz sinewave (fig.3), we can see a fairly high level of 120Hz full-wave rectified power-supply-related noise, as well as harmonics of the power-supply noise at 240Hz. The amount of high-frequency spuriae is generally low, with no harmonics of the 1kHz signal apparent. Notice also the exceptional linearity, indicated by the 1kHz tone's amplitude falling exactly at the ~90dB horizontal division.

The departure from linearity plot (fig.4) re-
veals the extraordinary linearity of the UltraAnalog DACs. The Fade to Noise is virtually a straight line, while linearity error at −100dB is remarkably low.

Channel separation (fig.5) was moderately good, with the L–R slightly different from the R–L. Note the different curve shapes. This measurement is made by decoding discrete frequencies in one channel and measuring the crosstalk in the other channel. The best separation was R–L at 125 Hz (95dB), the worst was R–L at 16 kHz (62dB). This is generally adequate, but is far from the Stax DAC-X11’s separation of better than 130dB through most of the band, decreasing in one channel to 110dB at 16 kHz.

No interchannel phase error was measured, typical of dual D/A converter designs. Output impedance was 324 ohms at 1 kHz, 341 ohms at 17 Hz, but 3456 ohms at 20 kHz. The 1 kHz, 0 dB squarewave (fig.6) is typical of the NPC digital filter in that the Gibb’s phenomenon ringing is clipped. Looking at a −90.31 dB dithered 1 kHz sinewave was fairly difficult due to the somewhat high level of 120 Hz noise. (There was also some very low frequency noise present on the unit’s output.) However, we can see from fig.7, which shows an undithered 1 kHz waveforms at the same level, the remarkable precision of the UltraAnalog DAC. The steps at +1, 0, and −1 are clearly visible, indicating the DAC’s precision.

Finally, fig.8 shows the VTL’s output spectrum while decoding a signal representing a 1:1 mixture of 19 kHz and 20 kHz tones with the composite waveform peaking at 0 dB. While the aliased image of the 20 kHz component at 24.1 kHz (44.1 kHz–20 kHz) is buried in the noise—which is excellent—the 1 kHz intermodulation product at 1 kHz is higher in level than usual at −62.1 dB, shown by the cursor position. This is a severe test of a CD player’s or D/A processor’s HF linearity, however, though this behavior might contribute to my feeling that VTL homogenized instrumental outlines when compared with the Stax.

**Conclusion**

The VTL Digital to Analogue Converter sets new standards for digital playback quality in some areas. The presentation aspects in which the VTL excels—and clearly beats the competition—are also the most important musically. These include exquisitely smooth and liquid midrange and treble textures, complete freedom from hash and grain, and resolution of the smallest musical detail and nuance. These qualities combined synergistically to create an involving intimacy with the music not equalled by any other digital processor. Although the Stax DAC-X11 came very close in these areas, I felt the VTL offered a more satisfying musical experience.

However, the VTL fell short of the Stax’s performance in other regards. The VTL didn’t have the razor-sharp edge to image outlines, instead tending to homogenize individual instruments with the entire presentation. Low-frequency reproduction was on the warm side, rather than
articulate and well-defined. Pitch definition was superior through the Stax, as was LF extension and dynamic impact. Overall, the VTJ can be characterized as warm, round, silky-smooth, and liquid. This is contrasted with the Stax's slightly etched treble character and bass dryness, which contribute to a lean and more detailed presentation. Note, however, that I believe both these processors provide a qualitatively different experience from digital playback, unmatched by units employing conventional IC DACs, regardless of their design.

I must reiterate what I consider to be a serious liability of the VTJ D/A: the lack of a muting circuit. The horrendous burst of noise that occurs under a variety of conditions (those that cause the processor to lose lock with an incoming signal) is most disconcerting. Although one learns to work around this problem, it is never far from one's mind when considering changing digital cables, switching inputs, etc. In addition, I am concerned about the quite large de-emphasis error of 1.5dB at 16kHz.

Despite the presentation tradeoffs with the Stax, the bottom line is that the VTJ D/A Converter provided the most musical and enjoyable digital playback I've heard. On that basis, it earns a hearty recommendation, provided the reader is aware of the caveats in the previous paragraph. However, since my review sample was serial number 003, it is not unreasonable to expect design refinements in future production.

Imagine the reaction in 1982 of the CD’s promoters (and the general public) if you told them that in 1990, the benchmark of performance for digital playback would be set by digital processors realized with tubes.

MERIDIAN 208 BITSTREAM CD PLAYER / PREAMPLIFIER

John Atkinson

CD player with integral preamplifier and full remote control of functions via supplied 209 handset, two line-level inputs, one tape loop and optional phono input, fixed and variable outputs, one pair of optical outputs, and one coaxial digital output. CD player specifications, fixed outputs: Frequency response: 20Hz–20kHz ±0.2dB. THD: <0.004%. Noise: <94dB. Conversion: Bitstream, PDM, differential time-aligned mode, 256x-oversampling digital filtering with passive final low-pass filtering. Precision: 16 bits. Output impedance: 12.6 ohms, fixed outputs. Maximum output level: 2.208V, fixed outputs. Preamplifier specifications: Output impedance: 12.5 ohms, variable outputs. Maximum output level: 10.02V (for 1% THD), variable outputs. Sensitivity: 50.7mV in for 500mV output. Line stage gain: 19.9dB. Dimensions: 12.6" (320mm) W by 39" (99mm) H by 12.6" (320mm) D. Serial number of unit tested: F100386. Price: $2950 including handset (phono module costs $250). Approximate number of dealers: 50. Manufacturer: Boothroyd/Stuart Ltd., 13 Clifton Road, Huntingdon, Cambs. PE18 7EJ, England. North American Distributor: Meridian America Inc., 14120-K Sullyfield Circle, Chantilly, VA 22021. Tel: (703) 818-3028. Fax: (703) 830-7625.

"Desperation is the Mother of Invention." Isn't that how the proverb goes? Certainly it applied ten years ago in the case of the Philips engineers working on the development of the Compact Disc system. Given a specification that had included a 14-bit data word length, they had duly developed a 14-bit DAC chip, the TDA1540, only then to be informed that the CD standard decided upon after Sony joined forces with the Dutch company would involve 16-bit data words. (Thank goodness!) Philips having already committed the 14-bit design to silicon, they would not have a 16-bit DAC ready in time for the medium's launch in the Fall of '82. They were thus faced with the problem of squeezing four times the resolution from their existing 14-bit DAC. The result was an ingenious digital filter that combined 4x-oversampling and noise-shaping—the latter is effectively a digital feedback loop, the error produced when the filtered digital data are truncated to 14 bits being fed back to the beginning—to give a digital system with full 16-bit resolution. Philips's true 16-bit DAC chip, the TDA1541, followed in 1985, but the seeds of ingenuity had obviously been sown: if the combination of oversampling and noise-shaping can increase the resolution of a DAC using too few bits, then why not go
all the way and implement a system that used a simple 1-bit DAC and make up for the shortfall in resolution by taking the oversampling, noise-shaping process to the limit?

The result was a D/A system, internally referred to by Philips as “DAC3” (the two earlier systems were DAC1 and DAC2, of course), which was introduced in the summer of 1989. I discussed the design of the system in detail in June 1989 (Vol.12 No.6, p.57), but briefly, the SAA7321 DAC3 chip massively oversamples the input data at a 256x rate, interpolating the new sample values to produce a 17-bit datastream sampled at 11.02MHz. The data words are then fed to a 1-bit DAC, with the 16-bit error fed back in a noise-shaping loop. Mathematically, this should—and does—result in the pulse stream output by the DAC having the full 96dB+ dynamic range of a conventional 16-bit system. But unlike multibit systems, this “Bitstream” DAC is inherently linear and monotonic over its entire range—the reasons why were given in Peter Mitchell’s “Industry Update” in January 1990 (Vol.13 No.1, p.36)—requiring no laser-trimming of on-chip resistor values or in-production adjustment of linearity, both of which add to a CD player’s manufacturing cost, hence price.

I was told by Philips last year that the Bitstream DAC was therefore intended to be used in low-cost and portable players, the company saying that they would remain with their TD1541-based chip set for high-performance players. Very rapidly, however, once designers had tried the Bitstream approach, it became apparent that, correctly implemented, it could surpass traditional D/A conversion in the preservation of low-level detail. (Even Philips has now introduced a Bitstream player, the LHH500.)

Hard on the heels of the introduction of

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1 Meridian launched their 602 transport and 603 D/A processor at the SCES in June, the latter using Philips’s second-generation Bitstream DAC chip, the SAA7350BS. This runs at a 384x oversampling rate of 16.9MHz and allows its user to match it with a proprietary digital filter. These products will be more expensive than the 200-series components, however.
Meridian's 206 CD player, which I favorably reviewed last July and which uses Philips's conventional multibit DAC, the English company redesigned their 207 CD player/preamplifier to incorporate the Bitstream DAC. The result was the 208, the subject of this review.

Technical details
Superficially identical in appearance to the 206, the 208 consists of two extruded aluminum chassis faced with glass and bolted together. The 208's transport is on the left, this sliding out in its entirety to allow discs to be loaded and unloaded. When closed, the transport is sealed against airborne vibration. The right-hand side carries function buttons, some of these lit by LEDs when operated, and a green 7-segment display panel. Three LEDs also display signal polarity, disc pre-emphasis, and errors. Two yellow buttons on the far right control volume up and down, there being 64 discrete steps as well as a mute function. There are also source-select buttons for analog line, tape, and the optional phono inputs, these latching on the first push, reverting back to the CD output when pushed a second time. Although there is a back-panel power switch, Meridian recommends the 208 be left on continuously, a front-panel Standby switch shutting the display down but leaving the circuitry powered. All front-panel functions are duplicated with the supplied model 209 remote handset, this also having an absolute-polarity button, fast search buttons—unusually, the output mutes during search—and a numeric keypad for direct track access.

The rear panel carries three pairs of analog outputs—fixed from the CD player, variable from the preamp section, and tape out—and three pairs of analog input phonos. There is also a headphone output. A pair of TOSLINK optical data outputs are provided, as is one coaxial phono data output. There is also a DIN "Communications" socket to allow the 208's functions to be controlled by the remote supplied with the Meridian D600 "digital" active loudspeakers.

The SAA7321 incorporates two channels of digital filtering and DACs as well as output op-amps; a single chip can thus be used for the complete analog signal reconstruction for a stereo player. Meridian uses two chips in a more sophisticated manner, however. Each is fed both the normal digital datastream and an inverted version of that data. One chip outputs pulse streams representing normal and inverted analog left-channel signals, \(-L,\) and the other pulse streams representing \(R\) and \(-R.\) These four pulse streams are passively low-pass filtered, reconstructing the analog waveforms in the process; then, rather than being fed to the on-chip op-amps, they're taken to two NE5534 integrated-circuit op-amps, these low-noise types with a good output drive capability. The two inputs of each op-amp are fed the non-inverted and inverted analog signals for one channel; its output therefore represents the difference between the two signals, and any even-order harmonic distortion or correlated (common-mode) noise will be canceled as a result. Departures from linearity common to both DACs on the one chip will also be canceled, with increased low-level resolution being the result. A second 5534 appears to be used in this stage's overall feedback loop, while an LF353 op-amp provides a DC-servo action to keep the direct-coupled output's average value at ground potential. FETs pull the output to ground when the mute button is pushed. As with other Meridian products, the construction is first-rate. All the audio circuitry is carried on computer-grade, four-layer printed circuit boards, these incorporating a full ground plane. Much design attention has also been paid to the Philips transport mechanism, and a high-precision central quartz-locked clock is used to minimize the effects of data jitter (see later).

Sound
Amplification used with the Meridian 208 consisted of either an Audio Research Classic 60 or a pair of Mark Levinson No.20.5 monoblocks fed via 15' lengths of AudioQuest Lapis or Audio Research unbalanced interconnect. Loudspeakers used during the auditioning included the Celestion SL700, Avalon Eclipse, Icon Parsec, Monitor Audio Studio 10, Infinity Modulus/Modulus active subwoofer, Meridian D600, and Dick Olsher's Black Dahlia design, all except the active Meridian bi-wired with 5' lengths of AudioQuest Clear.

For reference, LPs were played on a Linn Sondek/Ekos/Troika setup sitting on an Archi-Dee table with RIAA equalization and gain provided by a Mod Squad Phono Drive EPS, this feeding one of the line-level inputs of the Meridian 208. (The Linn was fitted with the new Lingo external power supply—enthusiastic.
I first used the 208 as a line-level preamplifier, comparing the effect it had on the sound of other sources with my Mod Squad Deluxe Line Drive AGT passive control unit. (The Mod Squad is still the most transparent full-function passive control unit I have heard.) It might be thought that a preamp stage inside a CD player, with all that RF energy floating around, and in particular one that uses op-amps for gain and FET-switching to implement the remote volume control, might be compromised in sound quality. That didn't prove to be the case here. Though it did add a slight veiling compared with the Mod Squad unit, the 208's line stage was superbly clean, with excellent bass weight and a freedom from electronic glare. Not only is the luxury of remote control of volume addictive, I feel the 208 is good enough when used as a preamplifier that those whose priority is to get the best CD sound should seriously consider using a 208 as the heart of the system, its line inputs used to take tape and tuner sources or even the output of an auxiliary phono stage. (The review sample was not fitted with Meridian's own $250 phono stage, so I can't comment on its sound.)

I also used the 208 to drive the Meridian D600 active loudspeakers that I reviewed a year or so ago (in Vol.12 No.11), its two optical digital outputs allowing each speaker to be driven separately. This proved to give the best sound I had heard from these speakers. If you own D600s, you should seriously consider acquiring a 208. Taking an analog feed from the 208's fixed outputs in order to compare Bitstream D/A conversion with the D600's oversampling multibit DACs wasn't possible, however, as it didn't prove possible to match levels closely enough for rigorous comparison.

Used as a conventional CD player with its fixed outputs feeding the Mod Squad control unit, it was immediately obvious that the 208 produced one heck of a fine sound: open and detailed, with excellent bass extension and a solid, deep, well-defined soundstage. There was little of the sense of treble hash that so often overlays digital sound quality. If you've heard Wendy Carlos's excellent recorded essay on reconstructing the sounds of real instruments with synthesizers (Secrets of Synthesis, CBS MK 42333), you'll be familiar with my feeling that, no matter how closely its advocates say their efforts approach reality, synthesized sound is more akin to shaped and textured noise than to real instruments. Right from the start, no matter how good it may be in some ways, CD playback has always had a similar character, in my opinion, the sound of complex sources like the orchestra tending to become overlaid with HF buzz. This the 208 does to a considerably lesser extent than the norm, to the benefit of the music.

Some might find the 208's sound to be rather laid-back, preferring a more vivid presentation of music's high frequencies. My tastes veer in the opposite direction, however, provided that this laid-back balance is not achieved at the expense of suppressing detail, and detail is something the 208 has no problem in decoding. The piano sound on my recordings on the Stereophile and HFN/RR Test CDs was both harmonically and spatially correct, the piano image suspended unambiguously in the space between the loudspeakers.

Dispensing with the control unit and driving the power amplifiers straight from the 208's variable outputs gave an even more musical sound, something that surprised me considering that I had felt the 208's line stage to be a little veiled compared with the Line Drive. Used in this way, the 208 approaches Class A performance in the magazine's biannual "Recommended Components" feature. My only criticism would be a slight leananness to its lower midrange.

Reviewing products in isolation is useful in that it gives you a broad idea of their absolute merit. Stereophile readers, however, need to be told of a product's relative performance, how it stacks up against the current benchmark products. I had on hand the Kingeretics KCD-40 and Meridian 206 CD players that I reviewed in Vol.13 Nos.1 and 7, respectively, and the Meridian 203 and Stax DAC-Xt Bitstream and multibit processors. I carried out two sets of tests with the five units. The first set was with the reference processor or player feeding the 208's line input and the 208's variable outputs feeding the power amplifier; A/B switching could thus be performed with the 208's remote control. In this situation, however, the 208's line stage is in circuit for every source. As it might be felt that the active circuitry would homogenize any differences, I therefore carried out a second set of tests with all the units' outputs driving the Mod Squad Line Drive Deluxe, this in turn feeding the power amplifier.
All interconnects were 1m lengths of AudioQuest Lapis. My impressions that follow are based on the results of both sets of tests.

My first comparison was with the Meridian 203 processor that has been so enthusiastically reviewed by Bob Harley and Sam Tellig in recent months. Retailing for $990, the 203 basically packs the Bitstream D/A circuitry from the 208 into a single box, omitting the absolute phase switch and error indicator light. For the comparisons, the 203 was driven from one of the 208's optical data outputs with a 1m optical fiber link supplied by Meridian. To show how critical level matching is with CD player tests, Tom Norton and I were listening to the 203, referring back to the 208; we had listened to a couple of tracks just out of curiosity, concluding that the 203 was more detailed and dynamic. But: "The 203 sounds louder," said Tom. I agreed. It was —by just 0.5dB! Though this would introduce two more sets of contacts into the 203's signal path, I had to lower its output with series potentiometers to match the 208's level before proceeding with my more critical auditioning. (All levels were subsequently equalized within 0.1dB at 1kHz.)

At first, it was hard to hear any difference between the 203 and 208 in either of the test conditions. Tonally, the units were almost identical—which is to be expected, given the fact that both of them are from the pen (pen?) of the same designer and feature identical DACs and output stages. But after several tracks had been played, I began to feel that the 208 was slightly more open in its sound quality. I find the purist guitar and double-bass recording on the Stereophile Test CD, with its fragile recorded acoustic, to be particularly good at revealing small differences in soundstaging ability. The 208 was that little bit better at enabling you to hear the way in which the guitar transients were reflected from the Chapel of Loretto's stone-faced walls. By contrast, the 203 presented the instruments as though they were in a somewhat less reverberant, more anonymous-sounding acoustic. But it was close. I could happily live with the 203.

I said above that the two Meridians were tonally almost identical. The "almost" is because ultimately I felt that the separate processor had a rather less-well-defined, less extended low-bass register. The 203 was leaner; though the 208 had a fatter midbass region, it also had a low bass which seemed to just keep on going down compared with the 203. Curiously, this reminded me of J. Gordon Holt's experience of the two-box Sony R1 CD player, the transport of which supplies an accurate, low-jitter clock signal to the D/A processor in addition to the time-multiplexed stereo audio datastream via a separate optical link. Perhaps—and this is a big perhaps—the better bass performance of the 208 is due to the fundamentally lower jitter offered by an integrated player. (See my discussion of the audible effects of jitter in the appendix to this review.)

The next comparison was with the Meridian 206, this player using the traditional 16-bit, 4x-oversampling Philips chip set. In my review of the 206 last July, I had remarked that it was the best player to use this chip set that I had heard, even better than the massive two-box Philips LHH1000. In particular, I felt the 206 to have excellent bass weight, well-defined imaging with good depth, and a refreshing freedom from the grainy treble so typical of ordinary CD replay. With a Stereophile test CD playing in each machine, the tonal differences between them were a little easier to hear than with the 203. The older player was both somewhat brighter and more forward in the midrange and sounded "louder" as a result. The flute on Stereophile's Poem album was consequently more full-bodied on the 206, while piano perhaps had somewhat more harmonic richness than on the 208. Low frequencies were similar, though the 208 did occasionally sound thinner in the lower midrange, the 206 having more midbass slam. As a result, the leading edges of bass instruments, the rosiny guttiness that starts the woody thrum of well-recorded double-bass, had a little more bite via the 208, though they had their full weight with the 206.

Again, however, even though the multi-bit player was no slouch in this regard, the Bitstream player was that little bit better at decoding the sense of space in a recording. On both my piano recording and Robert Harley's guitar and bass recording on the Stereophile Test CD, there was just that essential bit more of a sense of sonic reality via the 208. And on Peter Mitchell's organ recording on the same CD, the ostinato offbeat eighth-notes at the work's beginning were more easily placed in space.

How did the 208 stack up against the Kinetetics KCD-40, a player that has received universal approval in the high-end press for its musicality? Again, tonally, there were audible
differences between the two players. The Kinergetics was softer-toned in the highs, the 208 leaner in the lower mids; both fell slightly behind the 206 in bass weight. But spatially, I was hard put to hear any difference. Both had a similarly solid sense of a soundstage hanging between and behind the loudspeakers. Both had equally valid presentations of the music.

The 208 is obviously up there with the best-sounding players and processors. It seemed appropriate, therefore, to put it in the ring with the best-sounding CD sound I have heard, that from the Stax DAC-XII, a processor which both gets the closest I have heard to analog and costs a cool $12,000! Again, one of the 208's optical data outputs was used to feed the processor.

With the exception of the occasional listening session at LA's or RH's, I hadn't listened to the Stax for some months—since I compared it with the 206, in fact. With the first track to bounce back the laser beam, Jennifer Warnes's "Ballad of the Runaway Horse" from Rob Wassergerman's Duets (MCA MCAD 42131), that feeling, as Sam Tellig put it, of there being "more there" came back in spades. Not only did Miss Warnes's lispy contralto hang there in space between the speakers, but there was a believable but admittedly totally artificial sense of space occupying the loudspeaker end of the room. "Delicious" is the only word to describe the spatial spread of the accompanying "Ooohs" that come in the second verse as decoded by the Stax. Switching to the Meridian closed-in sense of space slightly but also flattened the individual images within that space. It was still excellent; it just didn't have the same degree of palpability as the Stax. Tonally, the more expensive processor presented the voice with somewhat less of a phlegmy edge, the 208 sounding a little leaner through the midrange. The 208's midbass was also fatter than that of the Stax, the tube processor having lows that were as deep but more cleanly defined.

All things considered, however, the 208 produced some of the finest sound from CD I have heard in my listening room, even if, as Larry Archibald remarked after we had spent an afternoon auditioning the Infinity Modulus system fed by the 208 and the Linn, "Your LP player still sounds better." I decided, therefore, on one final listening test, one that I rarely try as, with the exception of the Stax, I have yet to hear CD replay come close. This was a particularly cruel test, as it involved playing the Chopin track from the Stereophile Test CD on the 208, its fixed outputs feeding the Mark Levinson No.20.5s directly, then comparing that sound with that of the original 15ips analog master tape with the balanced outputs of the recorder (a Revox PR99, my A77 on which the recording had been made suffering from senility), again feeding the Levinsons directly. There was therefore no preamplifier or volume control of any kind to degrade the sound. Loudspeakers were the Monitor Audio Studio 10s, interconnects AudioQuest Lapis. As I mentioned earlier, the 208 sounds particularly fine on this track, decoding an excellent sense of space and throwing a well-defined piano image. But when I played the tape, as much as I enjoyed the sound of the 208 in isolation, the tape had a sense of solidity, of reality, that transcended the sound from CD. Okay, no matter how good the player, a CD is only as good as the A/D converter with which the original analog signal, from microphone or tape recorder, had been transferred to digital. In this case, I had used the Nakamichi A/D to transfer the analog tape to R-DAT, a processor which had seemed to sound very good. But even played on the otherwise excellent-sounding 208, it was like comparing superb, even enjoyable hi-fi with something that had much of the palpability of the real thing.

Operationally, the 208 was a dodder to use, track access being fast and the remote-control functions intuitive to grasp. Unlike the 206, the control logic now allows tracks to be selected directly with the "Next" button or the numeric keypad, without the "Play" button having to be pushed. Like the 206, though, the 208 still ignores subsequent commands while it is acting on the current one; you can't control volume, therefore, while the player is searching for a selected track, which is a minor inconvenience.

Measurements
Looking first at the 208's preamplifier section, the output impedance from the variable outputs was a low 12.5 ohms, meaning that the 208 should not be fazed by long or very capacitive cables, or low power-amplifier input impedances. The maximum output level (for 1% THD) was a hefty 10.02V RMS, this obtained with a 1.02V RMS input and the volume control at maximum (64). (With a CD, this maximum output was obtained from a 0dB signal
with the control set to 57.) The volume control itself showed excellent channel matching, the difference between channels averaging less than 0.05dB from level 64 down to level 16, below which the difference reached a maximum of 0.3dB at the lowest setting (1). The steps themselves varied between 0.7dB and 1.3dB in a regular pattern.

The line stage is non-inverting, but its frequency response showed a somewhat anomalous behavior. With the volume control at "64" and a 100mV input level, the response drooped by 1.2dB at 20kHz, as can be seen from the bottom curve in fig.1. Yet at lower settings of the volume control the response peaked up in the top octave by a fraction of a dB, again as shown in fig.1, implying that the HF rolloff of the 208's line stage is inversely proportional to the volume control setting, something I have not seen before. Apart from the premature rolloff when the volume control is near maximum, I doubt that this will be audible, however.

Distortion levels for the 208's line stage were astonishingly low. Fig.2 shows the THD and noise measured with a 1V input and the volume control at 48 averaging 0.03% across the band. Intermodulation levels also measured less than 0.01%. Channel separation was also excellent, as can be seen from fig.3, being greater than 95dB across the band with the undriven input shorted.

Turning to the CD player section with all measurement taken from the fixed outputs, fig.4 shows the frequency response, with a slight amount of passband ripple visible from the digital filter. The de-emphasis error (fig.5) shows the somewhat anomalous behavior that Robert Harley also found in the Meridian 203's performance last month. Channel separation was better than the 206; at worst, it was 78dB at 16kHz. The output impedance from the fixed outputs was a low 12.6 ohms, while the maximum output level was 0.86dB higher than
the 2V standard at 2.208V. (Actually, I can’t remember when I measured a CD player that had a true 2V maximum output level; presumably every manufacturer wants his player to sound that little bit louder than the competitor in the dealer’s sound room, hence the overall creep upward.)

A 1kHz squarewave at maximum level reproduced with the Gibb’s phenomenon “ringing” due to the linear-phase bandwidth limiting (fig.6), this unclipped. As with the Meridian 206, the 208’s output is polarity-inverting. Flipping the polarity is a piece of cake with the remote control, however; owners should remember that the 208’s CD output signal is non-inverted when the red polarity LED is lit. (This inversion is achieved by inverting the digital datastream from CD; the switch therefore has no effect on the 208’s analog inputs.)

Robert Harley enthused about the 203’s linearity last month; the 208 was equally superb, as can be seen from fig.7, computed by the Audio Precision system from the data gathered while the player reproduced the 500Hz fade-to-noise with dither on the CBS Test CD. Almost equaling the performance of the $12,000 Stax, the 208’s actual output level is within a fraction of a dB of what it should be down to below –100dB and within +2dB to –114dB! (The curve shown is for the left channel; the right channel was identical.) The excellent linearity was confirmed by sweeping a bandpass filter across the audio band while the player plays the dithered 1kHz tone at –90.31dB from the CBS Test CD. (The dithering means that any distortion apparent on this tone is due to the player’s electronics and not to the coarse signal quantizing at this level.) Note the absence of power-supply noise and of HF distortion harmonics in the resultant spectrum (fig.8).

Listening to both the 128x-oversampled bonger track on the Chesky Test CD (JD37) and the CBS fade-to-noise track revealed a total absence of harmonics and heterodyne-type (shortwave radio) whistles superimposed on the pure tone as it descended into silence some 120dB down from peak level. Looking at the waveform of an undithered 1kHz tone (fig.9), the stepped waveshape can just be made out, overlaid with audio-band noise, reinforcing the 208’s excellent low-level resolution. (See fig.10 in the Stax review, August 1990, p.110, for the best low-level resolution we have measured.)

Error correction was among the best I have experienced—Meridian does claim much-im-

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**Fig.6** Meridian 208, 1kHz squarewave at 0dB

**Fig.7** Meridian 208, departure from linearity, left channel

**Fig.8** Meridian 208, dithered 1kHz tone at –90.31dB with noise and spuriae, right channel dashed (1/3-octave analysis)

**Fig.9** Meridian 208, undithered 1kHz tone at –90.31dB

**Fig.10** Meridian 208, HF intermodulation spectrum, 300Hz–30kHz, 19+20kHz at 0dB
proved error handling. The only tracks on the Pierre Verany Test CD to give the 208 any trouble were those featuring one or more 2.4mm gaps in the spiral data path—extreme groove damage!

Finally, I examined the 208’s intermodulation performance with a signal consisting of a 1:1 mix of 19 and 20kHz tones, the composite waveform reaching a peak level of 0dB. The spectral analysis of the Meridian’s output is shown in fig.10; there are no intermodulation products visible, apart from residual spikes at 18kHz and 20kHz, some 70dB down from the 19kHz level. The aliasing product at 24.1kHz (44.1kHz–20kHz) can be seen at −55dB, shown by the cursor position; though better suppressed than with machines using the Philips 4x-oversampling, 16-bit linear chip set, it is still a little higher in level than with the very best-sounding players.

### Conclusion

If typical CD sound resembles shaped and textured noise, Meridian’s 208 joins that select group of components that more closely approaches the ease and spectral purity of good analog sound. Yes, I still preferred the ridiculously expensive Stax processor, but remembering that the 208 costs a quarter that high-flying component’s price, and considering that it includes a superb-sounding, remote-control line-level preamplifier, and that it is, at least in the eyes of this audiophile, beautiful, it can almost be considered good value for money. Buy it and live happily ever after. But to be honest, if you have an older CD player with a good transport—something like the Marantz CD94, for example, or even the Meridian 206—you can probably get quite close to the 208’s sound with the $990 Meridian 203. Now that’s a bargain!

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**Jitter, bits, & sound quality**

Jitter is not what digital sound quality induces in the listener; rather it is the instability in the clock signal that controls exactly when the analog waveform is sampled in the original A/D conversion, or when the digital word input into a DAC results in an analog voltage being produced at the chip’s output. “So what?” is the response of digital advocates, “As long as a digital bit is recognized as a one and a digital zero as a zero, then how can there be any difference in sound?” goes their argument, normally culminating in a fervently expressed “Bits are bits!”

Would that things were that simple. As my violin teacher used to say (and Lewis Lipnick still does say), “The right note in the wrong place is the wrong note.” It’s the same with digital data. Uncertainty in the precise timing of that digital one or zero results in a loss of system resolution, with audible effects on the finally recovered analog signal. In November’s “Industry Update” (Vol.13 No.11, p.78), Stereophile’s Dutch correspondent Peter van Willenswaard neatly showed how an uncertainty of well below 1ns—one billionth of a second! — in the timing accuracy of a 16-bit digital data stream resulting from an original analog signal sampled every 22.7μs, a time interval nearly 23 thousand times larger, equated with a loss of one bit’s worth of resolution. As Meridian’s Bob Stuart was the first engineer I had ever read who discussed the effect of digital data jitter, and had explained to me at the 1990 WCES that one of the factors behind the 208’s sound quality was not so much its use of Bitstream technology but a much-improved transport and data-recovery electronics, I thought it worth looking further at the subject of jitter.

In a recent issue of the *Journal of the Audio Engineering Society*, Steven Harris of Crystal Semiconductor looked at the effect of timing jitter on A/D converters. Included in his paper was a Basic program for simulating the effect of any amount or kind of timing jitter on any frequency or level of sinewave signal with A/D converters running with any bit resolution at any sampling frequency. The program outputs a data file consisting of the integer numbers representing the digitized sinewave; with a 16-bit system these range from −32,768 to +32,768. It was a moment’s work to write a couple of extra program lines so that these time-data files could be imported by the DRA Labs MLSSA software. I could therefore synthesize the action of jitter on a digitized waveform and examine the resultant analog effects with the MLSSA sys-

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1. In Stereophile Vol.9 No.2, March 1986, where he said in his interview with J. Gordon Holt (p.110) that “One least significant bit of amplitude is equivalent to 200 picoseconds of time... if the timing is off, the output... will not correspond in amplitude to the digital code.”

tem’s post-processing power in its distortion analysis mode.

(The Harris program is specifically intended for A/D converters, where not-totally-synchronous sampling produces data which are then read with a highly precise clock—something that is easy to synthesize. The situation with a CD player’s DACs, where nominally highly precisely clocked data are decoded with a degree of time uncertainty in the sample timing, is clearly the mirror image. The implications of these simulations will clearly, therefore, be transportable to DACs.)

I set up the parameters for a 16-bit ADC sampling at 44,100Hz—the CD standard—and synthesized a series of unfortunate 10kHz sine-waves afflicted with jitter ranging from none to 2 ns peak-peak (ie, the exact sample time can vary by +1ns or −1ns), with the jitter either random (white) noise or a 1kHz sine wave. I chose 1kHz, not because it is typical of the kind of frequency a jitter signal might have, but because it represents a readily identifiable spurious signal. Jitter of 1ns is typical of a good D/A processor (though Robert Harley tells me that the phase-locked loop that relocks the data stream in the common Yamaha S/PDIF receiver chip is specified at no better than 5ns jitter). The MLSSA FFT program was then used to examine the spectra of these signals, which are shown in figs.1 through 3.

The four graphs in fig.1 show the effect on a 10kHz signal at the 16-bit system’s maximum level (0dB) of jitter having this 1kHz periodicity. The top graph shows the spectrum of the pure 10kHz signal with no jitter. A single spike at 10kHz rises above noise components that lie between 112dB and 122dB down. (Summing all these noise components in an RMS manner will give the theoretical 98dB dynamic range of a 16-bit digital audio system.) The second curve has had 2ns p-p of 1kHz jitter applied to the data. While the noise components remain the same in level, note that sidebands at 9kHz and 11kHz have sprung up on either side of the fundamental, at −83.9 and −84.4dB respectively. This 1kHz spacing is, not coincidentally, the exact frequency of the jitter signal. Manipulating the purely digital data has therefore changed the final analog signal, something that the “bits-is-bits” school of commentators would have you believe to be an impossibility. The final two graphs in fig.1 show the effect on the analog spectrum when the jitter amplitude is
lowered, first to 0.4ns (400ps) and then to 40ps—40 Trillionths of a second! With reducing jitter amplitude, the sidebands drop until they eventually disappear back into the noise.

Fig. 2 shows what happens to the sidebands when the 1kHz jitter amplitude is kept constant and the signal is reduced in level (the sidebands drop with the signal, keeping the same −84dB relationship), while fig. 3 shows what happens to a 0dB, 10kHz signal when the jitter signal is changed from a pure tone (which is unlikely) to random (white) noise. By comparing fig. 3 with the top graph in fig. 1, it can be seen that the addition of 2ns worth of jitter has lifted the entire analog noise floor by 10dB. In other words, 2ns of p−p noise jitter reduces the simulated signal resolution from 16 bits to less than 15!

If you think about it, it is to be expected that digital-domain jitter prior to the DAC will produce effects in the analog domain. With data representing a sinewave signal, every time the sampling instant is late it is as though the shape of the reconstructed sinewave has bulged out a little at that instant. Conversely, if the sampling instant is early, the final sinewave shape will appear to have been sucked in a little. For a given sample time indeterminacy, the relative effect of that bulge or depression in the sinewave shape will be greater the higher in frequency that sinewave. Data jitter therefore has a more severe effect on high than on low frequencies.

A shape change on a sinewave is the fundamental description of analog distortion, and with jitter can be seen to produce an effect very similar to classic frequency modulation. In the case of a pure noise jitter, the reconstructed sinewave shape will be overlaid with that noise, giving the reduction in dynamic range seen in fig. 3.

Are these effects audible?

At the AES Convention in Montreux earlier this year, I sat in on a workshop examining the audibility of peculiarly digital distortion, including the effects of jitter. On pure high-frequency tones, low levels of sinewave jitter could easily be heard. Jitter, however, is unlikely to consist of a pure sinewave applied to the data; it will usually have a noise−like character. In addition, the data in a CD player are reclocked with crystal precision from a FIFO (first-in, first-out) RAM buffer, or have the clock signal extracted and stabilized with a phase−locked loop (PLL) in a D/A processor. Any jitter produced in the datastream by the CD player's laser pickup or present in the data output by the transport feeding the processor will therefore be very much reduced in level. (Though any jitter introduced at the time of the original A/D conversion will be treated as an intrinsic part of the signal, as in my simulations above, and will be preserved intact.)

Nevertheless, these results tie in with work by others that indicates that 16−bit data jitter of any kind needs to be less than 200ps or so if it is not to produce measurable effects in the analog signal,4 which in turn means that even though the data are reclocked, the crystal clock in the CD player or the PLL in the processor that do that reclocking need to hold their word−to−word timing accuracy to better than 10 parts in a million. And that time precision needs to be preserved during the digital data's travels on its way to the DAC, something that in my opinion is, frankly, unlikely.

The audible effect of jitter suggested by these simulations would be to add a signal−related grunde and lack of resolution as the analog signal's noise floor rises and falls with both the signal and the jitter, while any periodicity in the jitter—at the power−line frequency and its harmonics, for example—will throw up frequency−modulation sidebands around every spectral component of the music. The "clean" nature of the original analog signal will be degraded, "fuzzed up" if you like, to produce the typical, flat−perspective, often unmusically grainy CD sound.

Does anyone still feel that "bits is bits"?

—John Atkinson

4 Although other writers have felt that bit−bit jitter is important, I can't see that this matters, as all this affects is the exact time the stream of 16 ones and zeros is fed into the DAC's serial−to−parallel input register. A one remains a one and a zero a zero; in this respect, the "bits is bits" proponents are correct. Consider an abacus: it makes no difference to the result how fast, how slow, or how unevenly its user manipulates the individual beads. All that matters is the final state of those beads. If you need your abacus to produce its answer at a specific instant, however, then any variation in that time will have an effect. Similarly, jitter in the word−word timing, which will affect the exact time at which the DAC puts out its analog voltage or an ADC takes its analog sample, and which has been examined in this appendix, seems to me to be what is important here. With jitter applied to the datastream, bits may indeed still be bits, but only if you never convert them to analog—a truly Zen situation!

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3 In his paper, Dr. Harris examined whether his simulations were correct by building an experimental setup whereby precisely known quantities and types of jitter could be injected into an A/D circuit. The measured effects corresponded very closely to those predicted by the program.

Stereophile, December 1990
THE LISTENING ROOM

Thomas J. Norton

MS-DOS (IBM compatible) room analysis program. Requires DOS 2.11 or better, 256k of RAM, and Hercules-compatible, CGA color, EGA color, or VGA color monitors. Price: $29.95. Available direct from Sitting Duck Software, P.O. Box 130, Veneta, OR 97487. Tel: (503) 935-3982.

How often has it happened, and to how many buyers? You buy that long-anticipated new pair of loudspeakers—the ones with all the rave reviews—that sounded like dynamite at your friend’s house. Or (less likely) in the dealer’s showroom. Checkbook lighter by a grand or (probably) more, you agonize over the placement. Flanking the window or straddling the doorway? Two feet out from the wall or five (and will I be able to get away with the latter with the local decorator)? Does the whole room need to be rearranged, with possible major disruption to domestic tranquility? Finally, your best guesses having been made, you sit down to listen to the first few bars of music. Aaaarrrgh! The Listening Room Blues.

Setting up a pair of loudspeakers to give their best in a specific environment is something of an art. We’ve all done our share of moving, tweaking, listening, and moving again, seemingly ad infinitum. Wouldn’t it be nice if there were a way that we could determine the optimum placement for our loudspeakers without pushing and shoving them around the room for days (or weeks) of experimentation?

That’s apparently what the folks at Sitting Duck Software thought. They did something about it. Their program, which will run on most IBM-compatible personal computers with graphics support, is designed to do let your fingers and computer keyboard do most of the work, not your back.

The Listening Room performs two primary functions. It will graphically show, at 10Hz intervals from 20–220Hz, peaks and nulls (at the listening position) due to standing waves. The program also looks at boundary effects—a separate phenomenon in which reflections off of adjoining surfaces reinforce or cancel the primary radiation from the loudspeaker, causing peaks or dips in the response. The default setting in the program, which may be manually altered, considers reflections occurring within the first 20ms. The program only considers the boundary effects from the nearest walls (the primary culprits): floor, rear wall, near side wall and, optionally, the ceiling.

The user begins by entering the dimensions of his or her listening room at the prompting of the program. At that point the computer calculates the standing-wave pattern for a standard “starting position”—with the listener against the back wall, his or her ears 36” from the ground, and the loudspeakers in the front corners—and graphically displays the results. The display is in color; those without color monitors can still get full use out of the program, but the black and white display is slightly less easy to intuitively interpret and use. At this point the user moves the loudspeakers and the listener around the monitor screen in three dimensions, using specific command keys (clearly noted on a key on the screen display—reference to the manual is helpful, not vital, in this program). As the loudspeakers and listener are “moved,” the display changes, indicating a new standing-wave pattern within the room.

The room’s axial modes (the standing waves set up by any two opposing ‘room surfaces’) are labeled L, W, or H on the display, depending on which pair of opposing surfaces caused them. Tangential modes (which involve two pairs of room surfaces) and oblique modes (which bring in all six room surfaces) are ignored; their effects are generally far less significant than those of axial modes.

The object is to minimize or avoid severe standing-wave patterns at the listening position. A “target area” on the screen, ranging from +6dB to −4dB, is highlighted; positioning should be adjusted until as many of the modes as possible are within this range—close to 0dB, if possible. Using the F1 command at any time during this exercise will bring up a new display: the boundary analysis for the currently selected placement. The objective on this display is to minimize severe, broad dips between 50Hz and 300Hz.

A few words here about what this program will not do: The program’s author does not cur-

1 Love that name!
rently recommend it for use with dipole radiators—though it would seem to be appropriate for loudspeakers which are bipolar in the low end (with front and back radiation in phase), such as the Mirage M-3. It cannot account for the effect of a cathedral or vaulted ceiling. Provision is made within the program to disregard the effect of the ceiling; this option should be selected if your ceiling is not flat. It will not account for other room idiosyncrasies—such as openings into other rooms and hallways, variations in wall rigidity, and room furnishings—all of which will affect the strength of the standing waves to some degree. It cannot combine the relative impacts of the standing-wave pattern, boundary effects, and the direct sound to give any kind of "all-encompassing" display. And, of course, the program only gives you information about timbral changes caused by placement, taking no account of whether or not a specific placement will be optimum for other factors—such as soundstaging.

And if you haven’t already figured it out from the above, The Listening Room is very much a manual, hands-on program. It will calculate and display the modes for any given room setup, but won’t choose a “best fit.” That’s up to the user, and is perhaps the most difficult part of the entire exercise—only if you’re exceptionally fortunate will you find a setup which doesn’t involve compromises. More than likely you’ll find several arrangements, each involving various tradeoffs; that’s when you must get down to actually listening to each computer-assisted setup to select the layout providing the best overall sound quality. The Listening Room will help you narrow down your choices; it won’t make the final decision.

An example or two will give you an idea of what I mean, and illustrate the sort of results you can expect. The figures shown are from dot-matrix—printer originals (letter-quality mode), the type available to most home computer owners. Since the problems of small listening rooms are inherently more severe than those of large ones, I arbitrarily selected a room 14’ L by 12’ W by 8’ H. Fig. 1 shows the results for a “first-guess” arrangement—one you

\[ \begin{array}{|c|c|c|c|c|c|} 
\hline
\text{Frequency in Hz} & \text{0} & \text{2} & \text{4} & \text{6} & \text{8} \\
\hline
\text{Effect} & 0 & 0 & 0 & 0 & 0 \\
\hline
\end{array} \]

2 Sloped ceilings have a less pronounced effect on the standing-wave patterns in a room than flat ceilings. In that respect, they are superior. Though their effect is smaller, however, it is also less predictable.
3 The program assumes a constant reflectivity coefficient (0.9) across the entire frequency range, which makes at least some provision for nonrigid walls, although a quite general one.

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might choose as reasonable without access to a computer setup program. (All dimensions in the room plot—right side, fig. 1—are in inches.) The woofer has been placed 12" off the floor—perhaps a "floor-standing" system on a low stand. The standing-wave diagram is not bad, but we should be able to do better. The boundary analysis (fig. 2) shows a dip centered at just under 100Hz, and another at 250Hz. The numbers at the upper-right-hand corner of the graph area are an aid to possibly indicate which loudspeakers and boundaries may be responsible for individual dips. *le, 105 LSpkFW* means that the distance from the left loudspeaker to the front wall *in isolation* would result in a dip at 105Hz. But reflections from other boundaries may serve to minimize or eliminate this dip. As a further aid in determining the cause of a specific dip in the response, the side and/or rear walls may be "toggled off" (as may the ceiling, as discussed above) to study the isolated effects of the remaining boundaries.

Experimenting with *The Listening Room* proved to be a learning experience. But that is part of its value: within the limitations of the program, you just might find yourself developing a new awareness of how rooms interact with the loudspeakers and listener. I could describe in pointless detail my many false starts and unrewarding detours, but to no end; as with any computer program, the user must ultimately develop a feel for it through actual use. *The Listening Room's* basic operations are simple to learn. Ultimately, with my hypothetical example, I arrived at the room configuration shown in fig. 3—not a setup I would have intuitively chosen for this room. But the standing-wave pattern was much improved, and the boundary plot in fig. 4 was marginally improved, though dips remained. It is impossible (or so it seemed from my experimentation with the program) to totally eliminate such dips in a real-world room—especially a small one. The rise at very low frequencies which is evident in all of the boundary plots is normal low-frequency room reinforcement. Which is a good reason for not wanting a loudspeaker which is anechoically flat down to very low frequencies (unless you have a very large room).

There has been some discussion of late over the use of certain "rules" in setting up a listening room, one of which is the "Rule of Thirds"—in which the left and right loudspeakers are a third of the way in from the sidewalls and the listener and loudspeakers are each a third of the way from the front and rear walls, respectively. *The Listening Room* can access this setup immediately at the touch of a function key. According to the documentation, however, this is not generally the best possible setup. Neither are two other "rules": the "Rule of Modified..."
Fifths" and the "Thirds/Fifths compromise," both of which are also accessible by function keys. None of them provided a standing-wave plot as good as those in either fig.1 or fig.3, although the boundary analysis of the Rule of Thirds looks promising (see figs. 5 & 6). But note the left/right loudspeaker positioning required in this room by the Rule of Thirds, and the distance from loudspeakers to listener!

As you can see, however, you are unlikely to arrive at a single computer solution which will be unequivocally "the best." Ultimately, some actual experimentation with positioning will be required, with the computer solutions as guides. Again, the value of this program is in its ability to limit the range of possibilities, not give you an immediate, obvious answer. And it is for that reason that a fully automated program is unlikely to see the light of day. If you ever see such a program, you can be sure that the programmer has decided on the "appropriate" tradeoffs. While The Listening Room can be tedious to use, it ultimately leaves certain qualitative decisions in the hands of the user—where they belong.

As a "real-world" check, I also fed the dimensions of my actual listening room into the program. It turned out that the positions I have most recently used for loudspeaker setup were close to optimum, given the limitations imposed by room access and the large (and not readily mobile) equipment area to one side of the room. This necessitates a slightly asymmetrical loudspeaker layout—which The Listening Room can accommodate readily. The boundary plots for this setup were less promising than the standing-wave diagram. Since change in the room layout is planned which will allow a more symmetrical loudspeaker placement, there will be further experimentation as part of an ongoing study of this room's response. Stay tuned.

I haven't discussed some of the program's other features. Treat the "listener" position as your turntable location, and select the best positioning for siting your LP playback—except that you are now looking for low-frequency nulls, not flat response. Unfortunately, these nulls are usually in mid-room, not along the wall where most of us have to place our turntables. The Listening Room also lets you choose between live, average, or dead room acoustics—which I did not find made much of a difference at the frequencies of concern. And several degrees of resolution may be selected for the plots. The tradeoff here is time vs ultimate resolution of the full depth of the dips on the boundary plot. The time differences were not significant on my computer. There is one resolution setting called Showave, which gives the average of the boundary plot for five adjacent points in the symmetrical mode; in the asymmetrical mode it averages the two channels, then gives the average of five adjacent points on the combined curve.

As in any computer program, the author is easily able to make continuous changes. We've had what we thought was the latest version for less than a month, and already there have been updates. You can now toggle off the standing-wave indicators for H, W, or L separately to make the plot less busy and allow you to concentrate on one opposing pair of walls at a time. In our version, while the results may be printed out at any point to retain a hard copy of your progress, it's not possible to store a setup to disc for later recall. The most recent version allows you to store and recall one setup. And one new version of the program supports a math coprocessor.

No computer program can do more than work with the inputs provided or substitute for intelligent analysis of the output. And it won't do you much good if you don't have an appropriate computer. If you do, or have access to one—or one of a number of dealers who provide setup assistance based on this program—The Listening Room can provide you with a valuable supplement to your own good judgment and careful experimentation. Used intelligently, I recommend it. At the price, it's a genuine bargain.

S

4 I didn't feel that this was enough. There should be a way to store to disc as many setups as you desire. It would also have been nice to immediately recall any given setup for instantaneous comparison with the setup currently being worked. I mentioned this to Bill Fitzpatrick, the program's author. He apparently implemented it immediately—it will be available on new versions of the program.
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So before you purchase just any headphone, think about it. You're serious about your music. Go to a STAX dealer and enjoy it as never before – truly for the first time.

Pictured top: SR-Lambda Signature earspeaker with SRM-T1 Direct drive amplifier.
Center: SR-Gamma Pro earspeaker with SRD-7 Pro adaptor.
Bottom: SR-80 Pro earspeaker with SRD-4 adaptor.
Stax Kogyo, Inc. 20620 S. Leapwood Ave., Carson, CA 90746.
Music in the Middle of the Country

Barbara Jahn talks with Leonard Slatkin, conductor of the St. Louis Symphony

I met Leonard Slatkin during a recent visit to England. Before I could speak to him, he had to settle, with both RCA and the LPO's manager, upon dates, programs, and soloists for his extensive range of concerts and recording. I wasn't at all surprised to overhear plans centering mainly on English music. I asked Slatkin if this was what he believed English audiences wanted from him . . .

Leonard Slatkin: It seems to me, outside of England, there's very little identification with English music. So, a few years ago, I began to think, since I really do enjoy the repertoire very much, that maybe a more worldly view of it all might not be so bad and might arouse some interest in repertoire which seems to be sitting there quietly, doing nothing. All musicians have certain areas of focus; on tour with my own orchestra, the St. Louis Symphony, it is gener-
ally thought and expected that we will do American and probably Slavic repertoire, which we love recording. At home, it doesn’t mean I don’t do everything else, because a Music Director of a major orchestra must run the gamut of repertoire. But the image outside of home is different. When I’m in German countries I’m doing Strauss and Mozart; I try to bring some American and English music there, but for the most part they don’t want to hear it.

Barbara Jahn: The English, I think, have been a little wary of non-English conductors in Elgar. You’ve come along and broken the mold. In this respect, wasn’t it daunting to take on our music?

LS: Maybe a long time ago it would have been a little more risky, but you have to remember, Boult and Barbirolli were contemporaneous to a certain degree with the composers they championed. Now there are very few people left who either knew them or worked closely enough with them to be able to be so-called authentic practitioners. So, whether you are English or American, the time has come to look at this music with at least one generation having passed, and, because of the time in which we live and the accessibility of other people’s performances, understanding certain traditions that are passed down, and ultimately having in front of you the composer’s text—which is supposed to tell us all we need to know. I don’t think it’s a problem investigating this literature whatsoever. I don’t think of myself as conducting Elgar in a specifically English manner because I think, as we approach the end of the century, the music itself doesn’t speak in quite the so-called English manner that it might have done 40 or 50 years ago. We can now begin to see Elgar as a much greater parallel with Strauss and Mahler; you can see the influences on Elgar that made his music speak the way it does. It would be foolish in the First Symphony not to have in the back of your head certain elements of the First Symphony of Brahms—the slow introduction to the last movement, the yearning slow movement.

One thing that has come up a few times: people keep talking about the Elgar rubato, and I keep thinking that it’s a natural musical one. It’s not Elgar—it’s the way the music flows, period. It’s quite clear in the music, for the most part, what Elgar wishes us to do. Some of his indications on the page don’t lend themselves in a practical manner, sometimes a metronome mark will be just a little bit faster than is physically possible to do. But ultimately, wouldn’t it be a shame if we all said that this music is so English that only the English should do it? If that were the case, would it communicate itself to the listening audience in any other country?

Wouldn’t it be a shame if we all said that this music is so English that only the English should do it?

When in German countries I try to bring some American and English music, but for the most part they don’t want to hear it.

Maybe it takes a slightly fresher view, from the outside, to put this music into a more international scope. But I’m not consciously thinking about that when I do it. There’s something in the music that moves me, and gets to me, and that I feel comfortable with.

BJ: You talk of Elgar’s rubato as obvious... It hasn’t been obvious to certain other conductors!

LS: No, because they have been so influenced by the people who were contemporaries of Elgar and Vaughan Williams. Then you’re dealing with imitation, and imitation is never natural, never something that you can feel. I can honestly tell you that in the case of Elgar’s works, I have listened to surprisingly few recordings to shape what I’ve felt. In fact, my first impression of the Second Symphony came from Sir Georg Solti; I heard him do it with Chicago when they were on tour in Minneapolis. I was amazed and overwhelmed by how wonderful it was. I was stunned by the sheer virtuosity of the work—I didn’t necessarily think about whether it sounded like Elgar. I immediately got the score and began to form my own opinions about it, and I’m not so sure that that wasn’t the only performance I ever heard of that piece aside from my own.

The First Symphony was a little different; I did know it from other people’s recordings. I remember listening to both Boult and Barbirolli—who had very different approaches to the piece, by the way, so that makes you won-
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der right away what the nature of tradition is: Boult was headlong, Barbirolli very relaxed. Mine falls somewhere in between, I guess, but not consciously. It’s just what I’ve arrived at in a study of the work. It’s just the same with the *Enigma*; it’s purely an arrival of certain decisions based on certain feelings, and having immersed myself in Elgar’s life I felt there was a darker side to this piece than I’d realized in the past.

Vaughan Williams, in the symphonies, is speaking more directly in an international language, even though you would suspect in the first three that he’s not.

**BJ:** *And yet he seems archetypically English.*

**LS:** But he goes down very well in the States. We are in the middle of a sort of VW discovery; I can’t think of any major orchestra that doesn’t incorporate one or so [of his] works in the course of a season. *At this stage we were interrupted by the arrival of letters.*

This is the most important one for the day. It’ll show the great, high level that we artists work at! I follow baseball teams and every day now they Fax me the results of the St. Louis Cardinals’ match. There are six weeks left in the season before the playoffs begin, so you hope your team comes to the top of the division and makes the playoffs. They are currently two games behind, but we don’t have a very good pitching staff and we’re worried. But I don’t know, baseball’s a funny game — anything could happen. It’s very exciting. I love watching it, and I go in and broadcast and help to announce games. *Replacing the letter in its envelope, Slatkin continued from exactly where he’d left off.*

I was recently discussing soloists for the *Sea Symphony* [with the concert promoters and RCA] and they came up with this whole set of names; when I proposed somebody else they said, “Are they steeped in the English tradition?” and I said, “The poetry is by Walt Whitman, what difference does it make whether it’s an English or an American singer?” If the text is what inspired the piece to start with, perhaps we should be thinking a little bit differently about this.

It was interesting when we were recording Elgar’s *Kingdom* because simultaneously with the English text is German, and the score’s by Novello, who was doing the complete English edition. That means Elgar certainly envisaged performances in German. I don’t see problems these days with this music, just as we don’t with Gershwin or Ives, or even Copland. For so many years, even I thought this music could only be played by American orchestras, but it’s simply not true. Different countries will have certain idiomatic qualities that we in America wouldn’t necessarily care about, particularly the woodwind and brass sonorities, but basically the style is comfortable — the LPO and Rattle have put out *Porgy and Bess*, and you won’t see anyone in America raising eyebrows about it. They may feel they don’t like it, but that is for reasons having nothing to do with the forces.

**If music can’t transcend borders it’s relegated to a very small place in musical history.**

**BJ:** *Does it sound idiomatic?*

**LS:** It sounds fine. If music can’t transcend borders it’s relegated to a very small place in musical history.

**BJ:** *When you recorded Walton 1 with the LPO, they hadn’t played it for 17 years and you felt that the St. Louis, who don’t have the Walton tradition in their blood, could have done it just as well. So why record Elgar with the LPO rather than St. Louis?*

**LS:** Because it is prohibitively expensive [to record] in the States. It costs four times as much and it seemed that under the current contract with RCA, there was a certain repertoire — the Slavic and American repertoire — that would be more suitable to do with my own orchestra and would be more saleable for the company, as opposed to the English repertoire which they could do here. I want to be represented on record with my own orchestra; that’s the fairest way to get an idea of what we are doing, but for practical reasons we can’t do more than five or six records a season in St. Louis. I have good relationships with the LPO and the Philharmonia. I enjoy working with them and they get along well with me. So it wasn’t on nationalistic grounds at all.

**BJ:** *So it’s true that the record-buying public feels more secure in discs of American music when you are conducting the St. Louis.*

**LS:** Yes, but that’ll change. An American conductor doing English music, even with an En-
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glish orchestra, begins to show people that there is something more. I’ll be very pleased when two things happen: one, when I’m asked to do some American music in England, and two, when I’m asked to do English music back home. But I’ve done some English things like the Tallis Fantasia with my orchestra.

**BJ:** That was recorded by Telarc.

**LS:** Yes, that’s right. I’m proud of it. I like that one.

**BJ:** I find it interesting that it was another American, André Previn, who had great success with English music in our country.

**LS:** Yes. He’s had a long association with your country.

**BJ:** And then there was your Walton Symphony I that was hyped up as the challenge to his version.

**LS:** Well, I still hold his Walton I as greater than mine, and they can set up the competition all they want to. You know, it was very funny. I got the lovliest note from André when mine came out. He waxed enthusiastic about it, and although it wasn’t planned, I’d just sent him a note about his Dvorák E-minor which I really enjoyed so much. It’s funny, people sort of set us up in competition, yet we are the best of friends and have a wonderful time discussing things together. There is no competition between us: I do things the way I wanna do them and he does them the way he wants to do them.

**BJ:** So you are now recording a lot of American and English music. Is there a danger of becoming typecast?

**LS:** When you think about it, most of the very fine collaborations between orchestra and conductor have centered around certain repertoire: with Solti/Chicago we think of Mahler, Bruckner, Strauss; with Szell/Cleveland you think of Mozart, Beethoven. Ormandy with the Philadelphia, Bernstein with the New York — there was a certain focus and, even though we may not be in that category and that’s not for me to judge, there is a focus of repertoire that we are known for. But if you come during the course of a regular St. Louis season you’ll see everything represented: Baroque, classical, contemporary.

**BJ:** You’ve received awards for adventurous programming of contemporary music. How is that economically viable? Twentieth-century music is still not financially sound.

**LS:** No, and ten years from now we are going to be listening to twenty-first century music. What I do in St. Louis is to try to balance the unusual pieces with the standard works. You’ll never see a program completely of twentieth-century music; I don’t like it. What happens is the audience inevitably gets to voting for what they like and what they hate. For the same reason I won’t do an all-Beethoven program; there is no balance. Adventurous programming means putting in a new piece that wouldn’t normally attract an audience and balancing it with a well-known soloist or a symphonic work that they really want to hear. So, if we have Itzhak Perlman as soloist, I know the house will be full, it doesn’t matter what else I program, so I might as well give the audience the chance to hear something unique. We were talking here about how to program some of the VW Symphonies because they really don’t sell well. Some I’ll record without performance because they can be worked out in the studio, others need performance. So, we’ll do the 6th Symphony in the first half of the program and Carmina Burana in the second. I like the piece, it’s fun to do, and balances pretty well with the 6th; it was written around the same time. Hopefully a few of the audience who have come for Carmina Burana will go away with some respect for VW 6 — they might not have heard it otherwise. So it’s the same thing with a new piece. I don’t want people comparing two new composers; I want each piece to live on its own. I wish we could do that with records, but we can’t. It would be fun to make a record of such variety that you couldn’t make a comparison.

**BJ:** So you are saying people buy in categories?

**LS:** Oh sure, that’s why I tend to record in cycles. So the Elgar will appeal to a certain crowd, and although I start with one VW record, when people know we are doing a cycle...
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Stereophile, December 1990
they will probably buy all of them. They may not like them all, of course. . . I guess there'll be people who hate what I do and won't get anywhere near it. . . [laughs].

BJ: You’ve been with the St. Louis for 11 years now. Can you see what progress you've made? Was there a certain direction you wanted to go in, and a specific reason for staying with them for so long?

LS: Eleven years is a short time by certain standards. By European standards, no; almost every English orchestra turns over every six/seven years. But there have been wonderful collaborations in the States in the past: Ormandy was with the Philadelphia for 43 years, Szell was in Cleveland for almost 30 years. Those days are over.

BJ: Why is that?

LS: Because we have demands put on us by the worldwide community and, in the past, seasons were not so long and the repertoire wasn't so broad. In the course of ten years, I've been through the Beethoven cycle three times. Forty years ago you couldn't have imagined that kind of situation. I love where I am; I'm not planning to go anywhere else, we are all growing together. But it helps not to repeat a piece for at least three years so that, when we come to it again, we are all fresh and not just playing it to death. I try to rethink my approach each time. But when I started in St. Louis—I knew the orchestra because I'd been its assistant—it seemed it needed just a little bit of a push for the rest of the country, let alone the world, to take it seriously. So I embarked on a plan, with the management, to record extensively and to tour. I also did a lot of going out into the community and fund-raising. If I was to leave now, at least I could say I left with people knowing something about the St. Louis. But I'm not going to leave until other things have been accomplished: I need to establish a financial base of security for the orchestra. Some orchestras are facing terrible financial crises; some have disappeared in major cities. Eleven years ago it was a little hard to see if we could get this far, but we've been very fortunate and I hope it will continue that way. I think we bring a particularly unique sound and style to our playing.

BJ: Which is. . .?

LS: A combination of American and central European playing. It's very rich and virtuosic, close to what you would have heard from the Philadelphia in the Ormandy days and from the Boston Symphony in the Koussevitsky days: it's a string-oriented sound—I come from a family of string players [Leonard's father, Felix, and his mother, Eleanor Aller, were both founding members of the great Hollywood Quartet]. It's not that my wind and brass players are not superb, they are fantastic, but overall what makes them fantastic is their ability to blend into the string sonority itself. Most people do remark that we don't sound like a typical American orchestra at all, and I take that as a compliment. A lot of orchestras coming to Europe don't know how to adjust to the smaller halls you have here. We're used to playing in these 2700 to 3000 seat auditoriums at home and in England, for the most part, the halls are a little smaller. In St. Louis, even though we do have a large hall, it is very luxurious and resonant, and we don't force our sound. We play in a very refined and slightly more cheerful manner, and we take that sound of our hall out to every place we go.

We take the sound of our St. Louis hall every place we go.

I think one thing that helps us is that we are not in a city where there is any competition. We can grow musically at our own pace. Very few touring orchestras come in. It's not like New York, or London, where every night there are two, three different orchestras to choose between, coming in with two, three programs they do very well. I can afford to try out some pieces that I may not be sure that I'd do very well, and many times I discover that I really don't do them very well, and I wouldn't want another public to hear them! But in St. Louis the orchestra and the public know that. So the overall plan was to let the world know about us and, now that they do, we must keep that level and try to improve upon it, to let people know that you don't have to be in New York or Boston to hear a fine orchestra. I'd like people to stop being surprised that there are other good orchestras. We all know that there are really great orchestras that can give really lousy performances just the same as there are inferior orchestras that, just once in a while, can rise to high occasion. Those of us in what we call the second line can play consistently night after

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night in a very fine manner, more often than not rising above the ordinary because we have to.

BJ: Your musicians play a lot of chamber music too. Presumably that trains them to listen hard and blend...

LS: Our orchestra has a series of 14 chamber concerts given by most of the musicians in different combinations. Many also appear as soloists with our orchestra in major subscription concerts. There's one concert each year I'll devote to featuring just the members of the orchestra, and not just the principal players but also the rank and file, the back of the violins, the second flute. This gives people a chance to hear the wonderful quality of the players, but mainly it gives the players the chance for respect they don't get when just sitting in the orchestra. All these things have added to a very stable orchestra. We've had very few defections over the last 11 years; most changes have been through retirements or deaths. I think that's a very good testament to the orchestra—they are happy sitting there in the middle of the country.

BJ: When you were a child and you were surrounded by music, was there pressure on you to be a musician?

LS: Quite the opposite.

BJ: But you were so saturated by it that nothing else entered your head?

LS: True, nothing else ever did, but my parents were constantly telling us not to go into music, that it was a major sacrifice. I'll tell you an interesting story about that: when I was about 13 or 14, I was practicing piano when, from outside the window, one of my friends called, "Come play baseball." My mother said, "Hey, you're not going out there until you've finished your practice," and I said, "No, I've been practicing for a couple of hours, I wanna go now." She said, "If you go out there, when you come back the piano's going to be locked up." To a 13-year-old American boy this was a wonderful thing to hear! Out I went, and after however long it took I came back in and, sure enough, my mother had locked up the piano. For three or four days I was in heaven, and then I went to my mother and said, "I'd like to play the piano now;" and she said, "No, you obviously don't want it badly enough. It doesn't mean that much to you." And I said, "Can't I have baseball and my piano too?" and she said, "You have music, then you have baseball when you have finished what you are meant to be doing." Well, I cried. I really wanted the piano back; I missed it. Then she finally unlocked it and I practiced very hard.

I regret that, in a way, we were so shut off from the rest of the world; there was very little else except music in our house. But I suppose if I hadn't had that kind of upbringing, I probably wouldn't be here today talking to people about music. And maybe she was right, because I would have been a lousy baseball player!

BJ: I believe Maestro Giulini told you that the way you conduct your life should affect your music! What else do you do?

LS: I read: in the evening, what's by the bedstand? A spy novel, a mystery, science fiction; things to take me away from what I do. Newspapers are important to me. I watch a surprising amount of television, perhaps just to escape. I watch mindless entertainment that I don't have to think about. I'm a voracious moviegoer. After I've finished here I'll have two weeks' holiday at home. We've just bought an old house that we're renovating, and I will catch up on all the television shows I missed in the summer—they're being taped for me. I'll go to baseball games when my team is in town (when it comes October I'm depressed for three months because there's no baseball). I like snooker; I'm a lousy player but I like watching it. I love to cook. That's what I really miss when I'm on tour—I can't be in my kitchen with all my utensils, burning things. Like almost all musicians, I love to eat. Unfortunately, when I get back I have to have my annual physical, when my doctor will say, "You're too fat," and my cholesterol level is still too high.

I would have been a lousy baseball player!

BJ: You must be very fit, though. Conductors tend to reach ripe old ages.

LS: It's fantastic aerobic exercise. Forty minutes of Elgar is more strenuous than what most athletes go through. It's wonderful for the heart, it's terrible for the legs and lower back, it's also a fantastic outlet for emotion. Most people think that off the podium I am cool and reserved, but I sometimes use the concert to get out frustrations, anger, love, and all the feelings that are in the music. I can literally become all the emotions that the music intends, and that's really good.
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Verdi, Mozart, and Wagner are greater composers, and *Carmen* is, quite simply, a better opera—more finely crafted, richer, and with deeper characterization. Giacomo Puccini was a popularist, a melodramatist, but his *Madama Butterfly* is one of the few "sure-fire" opera experiences, and no self-respecting opera collection should be without one (or even two or three), lack of snob appeal or not. It was the first live, complete opera I ever saw, and I'm certain that its lyricism, drama, and emotional potency helped convince me, at 16, that opera was valid and could speak to the mind and the heart. The heroine's innocence is so unassuming, her sadness so absolute, that only a heart of stone remains unmoved. It is the tragedy of a small person, and pardon me, Aristotle, but we're rarely as touched by the miseries of royalty as we are by those of people who have nothing else. *Butterfly* 's music is beautiful and telling, and *Butterfly* is a wonderful character.

*Madama Butterfly* is an opera whose characters we must believe; having a good time, just listening to pretty sounds, isn't enough. In the cast breakdown, here's what is needed: Suzuki, Butterfly's mezzo-soprano maid, must be devoted, sympathetic, and wise, and have a voice which blends with the soprano's in the Flower Duet. Sharpless, the baritone, knows what a mistake Pinkerton is making and tries to warn him; it also falls upon him to break the bad news to Butterfly. He must be avuncular and disapproving, as well as a diplomat. The tenor, Pinkerton, must be a person, in tone and attitude, who Butterfly would fall for—he refers to himself as a "Yankee vagabondo," and he must have a certain swagger and appeal. He also, we must believe, feels genuine love—at least, infatuation—for his bride. He's not despicable, just carefree enough to be destructive. Though absent from the entire second act, he's very important—a bad Pinkerton can ruin *Butterfly*.

Then there's the heroine. Needless to say, there must be a remarkable singing actress in the title role—*Butterfly* flops without a superb Butterfly. By characterization, the soprano should be a lyric—Butterfly is only 15 at the opera's start, 18 at its close—but the stirring
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climaxes and Puccini's orchestration all but demand a bigger voice. If the voice is too dramatic, on the other hand, then we won't believe the soft, girlish moments. The 18-year-old girl/woman who has no recourse but suicide must have many colors in her voice. On discs there's the further, peculiar fact that the soprano must sing in such a way as to make a visual impression—we should be able to "hear" a facial expression or tilt of the head.

And of course, there's the conductor. While this opera is not considered a "conductor's opera" the way Falstaff or the Ring are, the person in charge must know how to shape the performance, figuring out when and where it peaks. The opera's emotional climax comes when the heroine sights Pinkerton's ship in the harbor—"He has returned and he loves me," she sings rapturously—and it should overwhelm. But the leader must also be sensitive to the intimate moments and be able to define the other characters through tempi. This is a sensuous work. The score, even with its references to traditional Japanese themes, is not particularly subtle, and while it takes a lot to ruin it, it takes an equal amount to put a real stamp on it.

The overall assignment is tough. Passable performances of this opera abound, great ones are rare. Happily, Butterfly has fared surprisingly well on discs over the past five decades, attracting the cream of the lyric and spinto

### Synopsis—Madama Butterfly

The plot is well-known and does not try the credibility: the tenor, a vaguely good-old-boy American Naval Lieutenant named B.F. Pinkerton, is being shown around the house overlooking Nagasaki Harbor he's rented for his bride-to-be, Cio-Cio-San, by the marriage broker, Goro. Enter Sharpless, the American Consul; over a whiskey, Pinkerton explains that he's marrying this 15-year-old geisha and renting a house—and each has a 999-year lease which he can break whenever he wants to. He even proposes a toast to the American woman who will someday be his "real" wife. Sharpless warns him that Butterfly may be more serious than he, but Pinkerton won't listen—he's carefree, entranced by his own actions, having a good time. Butterfly and her entourage enter. After some chitchat, she tells Pinkerton that she's given up her religion in honor of his own. We also learn that her father was asked by the Mikado to commit ritual suicide and that he obeyed. After the brief ceremony, her uncle, a high priest, enters, enraged, and denounced her for giving up her tradition. Horrified, all leave. She and Pinkerton sing a passionate, rapturous love duet.

Act II takes place three years later. Suzuki, Butterfly's maid, is praying Japanese style: the more Americanized Butterfly is immobile. Pinkerton has been gone for a very long time and the household is almost out of money. Butterfly, telling Suzuki that she knows that someday Pinkerton will return, acts out the circumstances and precisely how she'll feel when he returns in her aria, "Un bel di." Both her innocence and her faith have remained unbroken. Sharpless enters with Goro, who has been trying to get Butterfly to consider a new marriage, which she has steadfastly refused to do. Sharpless has a letter from Pinkerton, obviously full of bad news. The two sit together while Sharpless reads to Butterfly. Pinkerton wonders in the letter whether or not Butterfly still remembers him. She's stunned to imagine that she could forget him. Sharpless attempts to tell Butterfly what he knows about "that devil of a Pinkerton" but cannot. He asks her what she would do if Pinkerton were never to return. In a heart-wrenching outburst, Butterfly says she could go back to being a geisha, but that she'd rather die. She shows Sharpless the child she has borne Pinkerton and asks him to leave. Suddenly a cannonshot is heard and Butterfly, gazing through a spyglass toward the harbor, spots Pinkerton's ship. Ecstatically, and with pride in her own faith, she sings "He has returned and he loves me." The act ends with Suzuki and Butterfly strewing the room with flower petals and a beautiful offstage humming chorus. All is hushed, and we wait with Butterfly, Suzuki, and the baby all night as they gaze through a hole in the screen.

As Act III opens, Butterfly goes offstage to put the baby to sleep. Sharpless and Pinkerton arrive—with an American woman who waits in the garden. Suzuki immediately realizes the truth, and Pinkerton sings an aria of remorse. Butterfly re-enters; when she realizes that the woman outside is Pinkerton's "real" wife, she accepts her fate quietly, asking only that the woman be happy. Asking to be left alone, she takes her father's ceremonial knife from its sheath and reads its inscription: "With honor dies who cannot live with honor." Just then Suzuki pushes into the room with the child, and Butterfly sings a heartbreaking farewell to him, urging him to go and play. As she commits suicide, Pinkerton's voice is heard calling her name, and he enters in time to see her fall over, dead.

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soprano crops and a bunch of great tenors. The average is surprisingly good, and a couple are crucial. There are 12 versions available and I'll deal with them all, but first, three out-of-print sets deserve mention.

The earliest was once on CBS, dates from 1949, and is worth hearing for the fresh Butterfly and Pinkerton of the young Eleanor Steber and Richard Tucker—both natural and vocally enchanting, if not very deep. In 1960, Victoria de los Angeles was partnered by Jussi Björling on Angel. The singing is simply gorgeous (a cracked high C from Björling at the love duet's close notwithstanding) and Los Angeles is remarkable, but no more so than in the earlier set, discussed below. Mario Sereni's Sharpless and Gabriele Santini's leadership were dull (and don't help Björling's joyless approach), so only Björling fanatics (and who can blame them?) and Los Angeles completists will actually need this set. Third is a most peculiar set, once available on London, which dates from the mid-'70s and stars Montserrat Caballé. She's surprisingly moving (and uses her famous piano to great childlike effect), and her singing is beautiful enough to make one's head spin. But Caballé's real-life husband Bernabè Marti is her strained Pinkerton, and conductor Armando Gatto is so terrified of the diva that he leads with no thrust whatever. In general, this set is a flop, but Caballé is a real surprise, definitely worth a listen.

Because the primary criterion for success in the heroine is believability, two sets can be ruled out, despite how alluringly they're sung. I refer to those starring Renata Tebaldi (London 411 634-2, ADD) and Leontyne Price (RCA Italiana-2 RCA 6100-2-RC, ADD). The former has much to recommend it: Carlo Bergonzi's Pinkerton is honeyed and seductive, the young Fiorenza Cossotto is a fine, full-bodied Suzuki, and Tullio Serafin's leadership has a nice inner tension. And while Tebaldi is no slouch dramatically (she sounds genuinely afraid when faced with the proposition that Pinkerton might not return), she's a real letdown in the little moments. Every time she has to laugh girlishly she sounds like a maniac. If we spot the prima donna in the shy episodes, as we do here, the show doesn't work. But her voice was never creamier or more lush, and as sheer singing I can't disssuade anyone from hearing it—it's quite an accomplishment.

Price isn't recommendable at all. Richard Tucker is quite rightly an American braggart Pinkerton, but he lacks cool, and Erich Leinsdorf's leadership is coldly workaday. Price fairly devastes in the big moments—the aria, the sighting of the ship, the death scene—but I don't believe her for five minutes and neither will you. A biker geisha we don't need. You'll revel in her gusher-like tones, but they're living proof that singing isn't sufficient.

The 1940 set starring Toti Dal Monte and Beniamino Gigli (2 EMI CDHB-69990, ADD) is a matter of taste: Some loathe it, others swear by it. Dal Monte, a light coloratura who tailored Butterfly to her vocal needs, is all small moments, using her light voice with great affection—so much so that if you don't buy it right away it can cloy until you want to hurl the discs away like frisbees. Her studied, insy-bitsy portrayal is nonetheless fascinating; she can make you cry. Her love and devotion for Pinkerton border on reverence—it's pathetic, believably sad, and we can see every move she makes. Gigli is fabulous—there's sex appeal and laughter in his voice, and his tone was rarely more a combination of virile lyricism than it is here. Conductor Oliviero De Fabritiis leads quickly, with energy and grace. This set is an all-or-nothing proposition, but I can't recommend it without warning.

Another such "problem" set is the recent one led by the ever-controversial Giuseppe Sinopoli, with Mirella Freni and José Carreras (3 DG 423 567-2, DDD, reviewed in Vol.12 No.7). The tempi are so erratic and slow that you may lose consciousness at times, but be patient. Freni is in glorious big voice, able to convince at all times, and Carreras, though vocally worn in places, is a dandy Pinkerton when Sinopoli doesn't drag him down. Teresa Berganza's Suzuki is the loveliest on discs. The entire scale of this reading is very big; overall, it packs a wallop—Puccini as German opera, but convincing on its own terms. This is not a first Butterfly, but like the Dal Monte, it's important as ancillary listening.

In 1957, RCA decided to take a pair of its newish stars and set down a small-scaled Butterfly. The result, starring Anna Moffo and Cesare Valletti (2 RCA 4145-2-RG, ADD), is a sort of "Butterfly-ette," very pretty and refined, with sweet voices and nice characterizations which one forgets all too quickly. Erich Leinsdorf, even less inspired than with Price a few years later, might have made a real statement about
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the privacy of the story, but he was obviously in too much of a rush. A pity, since the singing is so nice, but there's no urgency here.

A recent set pairs Anna Tomowa-Sintow and Giacomo Aragall under Rouslan Raichev (2 Capriccio 60-009-2, DDD). Both leads are in excellent voice, Tomowa-Sintow a particularly effective, large-scaled heroine, and Aragall never sounding better. But Alberto Rinaldi is an awful Sharpless, and conductor Raichev's mopey, unidiomatic leadership (he, the orchestra, and chorus are Bulgarian) sinks the ship fast. A performance with Veronika Kincés, Peter Dvorsky, and Lajos Miller under Giuseppe Patané (2 Hungaroton HCD-12256/7) is nice, due mostly to the heroine's in-depth portrayal, but you'd be hard-pressed to recall any special moments. It just goes by, due mostly to Patané's Italian-in-a-strange-land leadership.

Of the remaining five, four are crucial. I'll risk war by stating that I prefer Renata Scotto's second recording to her first (one is from '66, the other from '78). The first (2-Angel AVB-34068, A?) is led with great warmth by Sir John Barbirolli and boasts the marvelous Carlo Bergonzi and Rolando Panerai as Pinkerton and Sharpless. This is a performance impossible to dislike—everything is right. If Scotto had not re-recorded the opera 12 years later we'd be satisfied, but she really provides herself with stiff competition in '78 (2 CBS M2K-35181, AAD). Here Lorin Maazel's leadership is not as compassionate as Barbirolli's, but it's sexier. Plácido Domingo's Pinkerton, while as handsome and robust as one would like, does not compare in telling moments with Bergonzi's; he could be just about any tenor character. Ingvar Wixell, though impressive, can't touch Panerai as Sharpless. Then why vote for Scotto II? Because in Scotto I there's a feeling that she's not inside the role yet, and in II she is Butterfly. From her entrance to her death we never feel cheated or as if we're in the presence of anyone other than a young Japanese girl: Her head tilts, she smiles, she loves unquestioningly; she feels rage at Goro, she exults in the return of her husband, she's on the verge of collapse when she realizes that the lady in the garden is Mrs. Pinkerton. And her death scene is inevitable and terrifying. Don't miss this one.

And if you only want stereo, the other necessary performance is Freni first, with Luciano Pavarotti, Christa Ludwig, and Robert Kerns, under Herbert von Karajan (3 London 417 577-2, ADD). Freni is always lovely, her voice totally fresh—when she takes and holds the optional high D-flat at the close of her entrance, the effect is otherworldly, as it should be. I believe her every move, even if they aren't as vivid as Scotto's. Pavarotti pours out the most luxurious sound imaginable, and we know what Butterfly sees in this amiable guy. Christa Ludwig is all class as Suzuki; only Robert Kerns remains dull as Sharpless. But it is von Karajan who will either make you love or hate this set. (No one ever told him that this was not a conductor's opera.) His reading is entirely symphonic, and huge. Tempi are slow, but he only occasionally loses tension. (Some critics feel their minds wandering; I don't.) The climaxes are unbelievable under his leadership (and London's bigger-than-life recording)—never have I heard such a sound when Butterfly shows her baby to Sharpless; never has the sight of the ship seemed so apocalyptic. This set is almost literally a knockout, but listen before you buy—you may find it out of proportion to the drama. I love it.

Two mono recordings complete the picture, and you should own them both. One, from 1954, has the strongest all-around cast available: Victoria de los Angeles, Giuseppe di Stefano, and Tito Gobbi, with Gianandrea Gavazzeni conducting (2 Angel CDCB-49575, ADD). De los Angeles understates—her Butterfly is a fragile creature whose happiness is as complete as her misery; she's all innocence, and when she languishes, we feel it. This always wonderful singer has a way of attacking and swelling a note which goes straight to the listener's soul—it's ancient Sephardic religious music secularized, and it's breathtaking. Di Stefano is a most charming Pinkerton, close to Gigli; he and Gobbi banter back and forth in Act I like truly superior-feeling Americans in a backward culture. His tone is golden, and there's genuine remorse in Act III. Gobbi has the highest profile of any Sharpless—leave it to this great singing actor to make this guy really caring and heavily opinionated. Gavazzeni's conducting is the opposite of von Karajan's—he never lingers. He makes his points by driving the action forward with what at first may seem like abandon, but isn't. You won't doubt this story for a minute.

The other must-have mono is with Maria Callas, Nicolai Gedda, and Mario Borrello, with von Karajan again at the helm (2 Angel CDCB-

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47959, ADD), recorded in 1955. Boriello's Sharpless need not concern us—he's neither good nor bad. Gedda is young and caressing, easy to relate to and very believable at all points in the drama. He loves his Japanese wife—he just doesn't know how damaging he can be. But it's Callas who opens our senses as if we've never heard this opera before. One would think her unsuited to such a small character, this erstwhile Tosca, Lady Macbeth, Norma, and Kundry, but, as usual, one would be wrong. This is a child we're hearing; she's putty in Pinkerton's hands, and everything is a new experience to her in her newfound happiness in Act I. When Sharpless begins to read the letter, most sopranos sound eager; Callas is in a dream state, which makes her awakening into the reality of returning to the life of a geisha all the more horrifying. Just considering the possibility almost destroys this Butterfly. She defends herself against Goro's suggestions with a vengeance; she absolutely won't let his ideas get in the way of her faith. In the "Flower Duet" she's so happy she giggles while singing. And the big moments are gigantic—"Un bel di" becomes a mini-opera, and when she sights the ship, we look too. Her death scene is shattering. In its entirety it's an awesome performance. von Karajan is slow here too, but keeps everything intimate, the opposite of his later, very public reading with Freni. There's a nightmarishly bad tape splice at the point where Butterfly goes to get her baby to show Sharpless—the engineers wait a deadly two seconds before the orchestral attack after the words "Ah! m'ha scordata?" This may sound petty, but when you hear it you'll want to write nasty letters to Angel. (This was where a side-break occurred on LPs, but it's no excuse.)

If you insist on stereo, you must have the second Scotto and you'll be blown away by the Freni/von Karajan. If you can deal with mono (and the sound is actually quite good), both de los Angeles and Callas paint glorious portraits. Then there are the Dal Monte and Freni/Sinopoli. And if Butterfly doesn't affect you at all, well, don't tell me about it.
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**BACH: Christmas Oratorio, BWV 248**

Barbara Schlick, soprano; Michael Chance, alto; Howard Crook, tenor; Peter Kooy, bass; Chorus & Orchestra of Collegium Vocale, Gent, Philippe Herreweghe

Virgin Classics VCD 90781-2 (2 CDs only). DDD. TT: 2:29:39

Philippe Herreweghe leads performances of Bach which are astonishingly beautiful, and this one is no exception. His engineers (rarely identified, and not here) and he are definitely of one mind—they prefer a matte finish to a glossy one. This worked splendidly with his St. Matthew Passion (the most mystical I've ever heard) and other works, but the Christmas Oratorio—a joyful collection of cantatas—needs a shinier patina than most of the Bach masterworks in the repertoire.

At first I blamed the dazzle (not to mention razzle) on the pitch—yes, it's at 415 again—a half step below written, and this always (and particularly in D-major trumpet-and-drums sections) makes the performers sound like they're on 'ludes. (Yes, I know, pitch has slipped up a half-tone since the 18th century, but I don't like this practice. And just for the record, A = 440 was already common in Monteverdi's day, so "authenticity" is in the ear of the beholder.) So I compared Herreweghe's with Harnoncourt's (on Teldec), section by section; the latter is also at 415 but it's far perkier, both acoustically and attitudinally. Herreweghe seems to lack the celebratory abandon which Harnoncourt (for one) brings, say, to the opening chorus. Harnoncourt's tympani makes you want to applaud; Herreweghe's sound like Ernie Kovacs's Nairobi Trio used to look. He doesn't want to dazzle, and he and his engineers have made sure that he won't.

But it is beautiful. The singing is gorgeous and meaningful. Tenor Howard Crook takes both the Evangelist's and tenor soloist's music, and he's ravishing in both. Michael Chance's alto soloing is likewise stunning—just listen to his "Schlaf, mein Liebster" in the second part—the first note alone will set you reeling. Barbara Schlick never fails to please; her rhythmic and tonal accuracy make this music seem far easier than it is. Peter Kooy is a light-voiced bass who nonetheless makes his music come to life, and he has no trouble with the coloratura.

Chorus and orchestra share Herreweghe's outlook as well: they sing and play with style and grace, but rarely swing their collective hips. The chorus's diction is exemplary (as is the soloists')—another plus. This may just be an alternate view; and if you don't need the spar-
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Stereophile, December 1990
This release cannot be recommended. For one thing, Abbado observes the first-movement repeat, making that movement disproportionately long and disregarding Brahms's ultimate view that the repeat should be ignored. If the performance were more animated, transparent, and cohesive, however, one might live with this misjudgment. But Abbado vacillates between permitting the pulse to lag and whipping it up arbitrarily, and does further damage by imposing a few tasteless Lustpausen that sound like intrusive hiccups. Listen, for example, to the first movement where the sudden gasps produce rhythmic and aesthetic whip-lash, and note the finale's coda where Abbado's seeming inability to sustain the pulse weakens the music's climax. And why, one wonders, does the conductor ignore Brahms's specification of an important dynamic swell at the close of the second movement? And why, too, is the texture so thick that many key details are lost? Indeed, more of the score can be heard in the comparatively restricted sound of the nearly four-decade-old Toscanini recording, where the texture is always sharply focused, the color richer, and the detail more pointed. Certainly Abbado could learn from Toscanini how rhythm can be steady yet supple. Among currently available recordings, the Toscanini (on RCA, and one of that conductor's greatest achievements) is musically magnificent, but the sound, if fine for its vintage, is unquestionably boxy by modern standards. Among more recent accounts, that of Dohnányi (Teldec) may well offer the best combination of musical and sonic virtues. The performance of the Alto Rhapsody that fills out the Abbado disc will not justify its purchase. Lipovsek sings well, but seems more concerned with vocalizing the notes than with projecting the music's peculiar gloop. A disappointing release.

—Mortimer H. Frank

**BRUCKNER: Mass No.3 in f, “Grosse Messe”**
Karita Mattila, soprano; Marjana Lipovsek, contralto; Thomas Moser, tenor; Kurt Moll, bass; Chor des Bayerischen Rundfunks, Symphonie-Orchester des Bayerischen Rundfunks, Colin Davis
Philips 422 358-2 (CD only); Wolfgang Schreiner, prod.; Hans Schmidt, eng. DDD. TT: 65:24

If you've always thought of Bruckner the way you used to feel about the pretty but fat girl in high school—"she has such a nice face . . ."—this performance of the composer's F-minor Mass won't change your opinion. It's a massive work, with subtleties which are hard to pin-point, but Eugen Jochum (on DG) has proven that these subtleties can be found. Davis has not.

Much of the work of the mass is done by the orchestra, and Davis provides suitably grand gushes of sound which will make your speakers very happy. The problem is that these gushes don't do anything but gush—there's no meaning behind them. If you couldn't quite make out the Latin text, you'd never know it was a religious work. (Compare with Jochum for proof that the religious fervor can be located and expressed.) The "Gloria" lacks the ecstatic merry-making it should have, and, in general, the whole affair is full of freelance meditation on sound—an unmoving performance.

The orchestra and chorus are splendid, and soloist Karita Mattila shines, particularly in the "Hosanna." The ambience is grand, but this will neither elate nor stir you—you'll just feel as if you've eaten too much.—Robert Levine

**BUSONI: Piano Concerto**
Garrick Ohlsson, piano; Cleveland Orchestra, Men's Chorus (Robert Page, dir.), Christoph von Dohnányi

**BUSONI: Piano Concerto**
John Ogdon, piano; Royal Philharmonic Orchestra; men's voices of the John Aldis Choir; Danielle Revenaugh
EMI CDM 7 69850 2 (CD only). Christopher Parker, eng.; Susu Raj Grubb, prod. ADD. TT: 68:42

When the late John Ogdon's ground-breaking 1967 recording of Busoni's leviathan Piano Concerto was first released, it was highly acclaimed both as a powerhouse performance and for the score's unusual musical values. Thoroughly unconventional in its five movements, it is some 70 minutes long and concludes, Beethoven-like, with a mysterically conceived choral finale based on Aladdin by the early 19th-century Danish poet Adam Gottlob Oehlenschläger. Completed in 1904, the concerto's sprawling style is barely post-romantic, partly Lisztian/Wagnerian, but sometimes also reminiscent of Brahms, though with an Italian cast (as in the fourth-movement Tarantella). In its large scale, it even has some resemblance to Mahler. An intriguing, multi-varied, semi-cerebral work, the final two movements may perhaps be the most immediately accessible to

**BRAHMS: Symphony 2, Alto Rhapsody**
Marjana Lipovsek, contralto; Claudio Abbado, Berlin Philharmonic
DG 427 643-2 (CD only), Günter Hermanns, eng.; Günther Breest, prod. DDD. TT: 59:32

This release cannot be recommended. For one thing, Abbado observes the first-movement repeat, making that movement disproportionately long and disregarding Brahms's ultimate view that the repeat should be ignored. If the performance were more animated, transparent, and cohesive, however, one might live with this misjudgment. But Abbado vacillates between permitting the pulse to lag and whipping it up arbitrarily, and does further damage by imposing a few tasteless Lustpausen that sound like intrusive hiccups. Listen, for example, to the first movement where the sudden gasps produce rhythmic and aesthetic whip-lash, and note the finale's coda where Abbado's seeming inability to sustain the pulse weakens the music's climax. And why, one wonders, does the conductor ignore Brahms's specification of an important dynamic swell at the close of the second movement? And why, too, is the texture so thick that many key details are lost? Indeed, more of the score can be heard in the comparatively restricted sound of the nearly four-decade-old Toscanini recording, where the texture is always sharply focused, the color richer, and the detail more pointed. Certainly Abbado could learn from Toscanini how rhythm can be steady yet supple. Among currently available recordings, the Toscanini (on RCA, and one of that conductor's greatest achievements) is musically magnificent, but the sound, if fine for its vintage, is unquestionably boxy by modern standards. Among more recent accounts, that of Dohnányi (Teldec) may well offer the best combination of musical and sonic virtues. The performance of the Alto Rhapsody that fills out the Abbado disc will not justify its purchase. Lipovsek sings well, but seems more concerned with vocalizing the notes than with projecting the music's peculiar gloop. A disappointing release.

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the first-time listener, who might be forewarned that, with some patience on his part, the concerto can prove to be a piece of considerable impact.

Ogdon’s powerful, fire-eating performance, with adequate but commendable playing by the Royal Philharmonic under the American Busoni specialist Daniell Revenaugh, was the very first recording, but two more versions precede the newest entry by Garrick Ohlsson, Christoph Dohnányi, and the Cleveland Orchestra. These, which I haven’t heard, are, respectively, by pianist Boris Bloch with Christoph Eschenbach conducting (Schwann 86 106), and Volker Banfield with conductor Lutz Herbig (Classic Produktion Osnabrück 999 017-2), but it would be hard to imagine that they could be more impressive, pianistically, than the two under consideration. So far as the differences between the EMI and Telarc performances are concerned, the advantage is slightly in favor of Ohlsson/Dohnányi for reasons of slightly tighter, more virtuosic orchestral playing and sonics that are simply superior in terms of separation, warmth, and cleanliness. Both pianists roar through their difficult parts with enormous energy and vitality, but, unfortunately, EMI’s climaxes tend to be raucous. EMI, otherwise satisfactory, is here outclassed by more impressive state-of-the-art reproduction from Telarc. —Igor Kipnis

DVORÁK: Piano Quartets, Opp.23 & 87
Ames Piano Quartet
Dorian DOR-90125 (CD only). Craig D. Dory, Brian C. Peter, Doug Brown, engs.; Antonín Kubalek, prod.
DDD. TT: 69:51

There are many things easier than finding words to praise a performance that you know is not among the best. If I finally recommend other interpretations over those of the Ames Quartet, it is with the admonition that you’ll be missing some fine music if you pass these up.

The Ames is one of the few full-time piano quartets, and their experience playing together is evident in these two beautiful works by Dvorák. Beyond their tight ensemble work are intriguingly original conceptions. Phrases are shaped and paced in novel ways that sometimes do—and sometimes don’t—succeed.

In the Op.87, for instance, the opening movement has an almost winded quality that seems to impede the flow of Dvorák’s ideas but at the same time throws those ideas into a refreshing new light. It is this originality that will catch your ear, but the unexpected ritards and diminuendii may also catch you up. Compared to the fervent, singing lyricism of the Juilliard Quartet with Rudolf Firkusny, the music seems slightly earthbound, but there is still a beguiling freshness of approach.

Similarly, the second movement of Op.23 opens in a rather dour vein, only to snap to life in the middle section. This is in distinct contrast to the Beaux Arts Trio with Walter Trampler, whose lush cantabile pervades the entire movement. Again, the work is cocked a bit askew, and although the Beaux Arts/Trampler may be the performance you’d choose to listen to most often, the Ames can still seduce you into wanting to hear their unique view from time to time.

Working against the Ames is a warm sound quality that gives both works a leaden character. Many may like the full-bodied tilt toward the cello and lower piano ranges, but it could be a bit much for some systems and tastes. The upper frequencies also seem to struggle for emanicipation from the overbearing thickness. You can hear lots of hall, however. These works were recorded in the much-vaunted (by Dorian) acoustics of the Troy, NY, Savings Bank Music Hall, which I have found to be somewhat dull and suffocating both on this CD and on Dorian’s recording of Julius Reubke’s piano sonata played by Jean Guillou. To borrow a term from the equipment reviewers, this disc is highly system-dependent.

What the Ames Quartet offers is a singular and cohesive approach to these works with excellent musicianship and ensemble. Their special accent can be contagious, if not as ultimately endearing as the other performances mentioned.

—Robert Hesson

DVORÁK: Symphony 6, In Nature’s Realm
Libor Pesek, Czech Philharmonic Orchestra
Virgin VC 90791-2 (CD only). Vaclav Roubal, eng.; Zdenek Zahradnik, prod. DDDD. TT: 58:09
DVORÁK: Symphonies 7 & 8
Libor Pesek, Royal Liverpool Philharmonic Orchestra
Virgin VC 90756-2 (CD only). Mike Clements, eng.; Andrew Keener, prod. DDDD. TT: 75:09

It would be difficult not to feel predisposed toward a performance of Dvorák given by a Czech orchestra under a Czech conductor, so to evaluate this Symphony 6 without bias is no mean feat. Nevertheless, I think it is fair to say that Pesek really does have an instinctive empathy for the idiom, even though he reflects that in a rather more relaxed, laid-back approach than we are used to. The first movement, given without exposition repeat despite ample time allowance, sets the tone: beautifully sung, with delightfully balanced woodwind interjections, and that edgy, thin string tone so characteristic of this orchestra and so well captured by the Virgin team from The House of Artists in Prague.

The spirited Czech dance, the Furlant, so beloved of Dvorák in many of his composi-

Stereophile, December 1990 217
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tions, appears in a symphony for the first time here. Pekse points the contrast of its themes and rhythms with great flexibility and allows the exuberant Finale its head, even though the strings cannot always articulate cleanly at the ferocious speeds asked of them. The *In Nature’s Realm* overture, the first of a trio also containing *Carnival* and *Othello*, is joyous but simple and unaffected—a charming coupling to such a worthy disc.

For Symphonies 7 and 8—no one could deny the generosity of this package—Pekse returns to the Royal Liverpool Philharmonic Orchestra with whom he recorded the “New World” Symphony. Predictably the string tone is warmer, more wholesome, and virtually perfect for the dark-hued sobriety of Symphony 7, especially as Pekse avoids the ominous quality that so often pervades its performances by continuing in his characteristically relaxed manner. Again the recording is excellent, apart from jarring ambient cut-off at the close of the first movement.

Symphony 8 is rather more driven, as it should be, but still as lightweight in its textures and attitude. This suits the folk elements of the work, which dance with a gentle lilt, but may not satisfy everybody in the furious momentum of the Finale. So, for those building a library or extending an existing collection, this disc can be warmly recommended. If your requirements are for a rather more gutsy display, try Dohnányi on London (421 082–2), a two-disc set which includes Symphonies 7, 8, and 9.—Barbara Jahn

**GIORDANO:** Andrea Chenier

Maria Callas, Maddalena; Mario del Monaco, Andrea Chenier; Aldo Protti, Gerard; Maria Amadini, La Contessa; Silvana Zanoli, Berti; Lucia Danieli, Madelon; Enrico Campi, Roucher; Enzo Sordello, Fleville; Mario Cazzato, Incroyable; others. Chorus & Orchestra La Scala, Milan; Annonio Votto

*Live performance, January 8, 1955*

Rodolphe RPA 235551.52 (2 mono CDs only). A&D. TT: 108:31

Andrea Chenier, occasionally dismissed patronizingly by certain types of sanctimonious music analysts, is, for countless others, a highly entertaining example of *verismo* (realistic) opera; one that highlights many of the pros and a few of the cons of that diverting theatrical form. Essentially a singer’s opera, it demands three luscious, spinto voices (soprano, tenor, baritone) capable of projecting strong vocal personalities. Ensemble homogeneity, always welcome of course, takes a back seat to hyper-emotional arias and duets.

This celebrated performance of January 8, 1955 nearly satisfies that formidable mandate—but the show almost didn’t happen. Superstars Callas and del Monaco were due to appear together in Verdi’s *Il trovatore* at Milan’s Teatro alla Scala when del Monaco asked management to substitute Andrea Chenier. To the surprise of cognoscenti, Callas, hardly the most cooperative of colleagues, agreed, even though she had never sung the work. This necessitated her learning the soprano role in just a few days. Her reason for acceding is open to speculation. Insiders suggested that it may have had something to do with Renata Tebaldi’s (*Callas’s* archival) success in the opera, often in tandem with del Monaco. Would that the opera world had both a Callas and a Tebaldi performing currently.

Although the role of Maddalena is neither particularly lengthy nor demanding, Callas’s unique imprint, identified by that quite extraordinary intensity, insight, and verbal-cum-musical nuance, transforms even relatively mundane passages into revealing significance. Her singing of “La mamma morte,” climaxed by an animated, if not completely tamed high B, puts all other modern recorded versions (including her own on a recital disc) in the shade. I have seen Tebaldi in this work—partnered by del Monaco on a couple of occasions—and while she sang with great tonal beauty (up to high B-flat, that is) and looked lovely, neither she, nor anyone else since the 30s, fleshed out the character with such total command as Callas.

In the title role, del Monaco is, well, del Monaco! Translated, this signifies that one can expect exceptionally imposing, powerful vocal virtues adulterated by lapses of taste. A genuine *tenore di forza* (a rare breed) secure to electrifying high B-flats, he employed a limited range of dynamics and tone colors. I believe that he would have preferred to sing with greater finesse, applying mezzo voce and diminuendos more judiciously, had he possessed the requisite vocal control. His Chenier is an invigorating, if sometimes rough, oral experience infinitely more the revolutionary than the poet. The final duet, transposed down a semitone—as it was when del Monaco sang at the Met, and is for Domingo—is almost overpowering in its unrestrained fervor.

Gerard, the baritone character, has been likened to a humane, benign Scarpia. Requiring a similarly powerful, plangent, darkish sound, which Protti provides, it is also best served by a perceptive actor-singer. This, Protti isn’t. A solid rather than inspiring artist, he lacks a clearly defined vocal and artistic personality. The mere mention of some of his baritone contemporaries immediately conjures up the identifying timbre of their voices. Not so with Protti. He sings with ringing freedom but with little
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subtlety or histrionic distinction.

The conducting is similarly uninspired. Some tempo choices—for example, the frenetically paced, untidy opening pages—seem both wrong-headed and willful. Conversely, there are places where Votto appears to be following rather slavishly just behind his soloists. Thanks largely to the volcanic chemistry provided by Callas and del Monaco and the contributions of an effective supporting cast, this performance is synergistically momentous.

Rodolphe's packaging and production is on a much lower plane. The libretto is only in Italian and two important roles (Madelon and Roucher) are not identified on the cast list. But the most detrimental factor for prospective purchasers is the distorted, blasting sound reproduction which the mind is unable to accept even by the last scene. Even making allowances for 1955-vintage bootleg standards of taping, and bearing in mind that this opinion is expressed by one who still plays 78s and has collected "live" performances since they first appeared, it's difficult to derive much enjoyment from this set. My 25-years-old LP pressing is far more listenable. Even at budget price, and this CD set isn't, I couldn't recommend the release.

—Bernard Soll

MUSSORGSKY-RAVEL: Pictures at an Exhibition
SCRIABIN: Poem of Ecstasy

Neeme Järvi, Chicago Symphony
Chandos CHAN 8849 (CD only). Brian Couzens, prod.; Ralph Couzens, eng.; Mitchell Heller, location eng.; Paul Smith, asst. eng. DDD. TT: 52:53

Considering that the Chicago Symphony has made recordings virtually every year since 1945, it's scarcely surprising that their most recent recording of Pictures at an Exhibition would be their sixth since 1951. What is totally unprecedented in the history of musical careers of orchestra personnel is the fact that these six recordings of Pictures, which cover a time span of nearly four decades, feature the same principal trumpet player, the celebrated Adolph Herseth.

For the 1951 recording, Mr. Herseth, his CSO colleagues, and conductor Rafael Kubelik became involved with a piece of audiophile history, a blockbuster recorded by Mercury Records with a single mike, which sounded more like a real orchestra than anything they had ever heard previously on records. Mr. Herseth was in his late twenties at the time, and had only recently recovered from injuries suffered in an auto accident which would have finished the career of any normal brass player. Yet he returned to his newly appointed seat, and has gone on to become one of the world brass community's most honored citizens, who by virtue of his position has played a key role in creating the CSO brass legend.

Today, in his late sixties, he occupies a chair endowed in his name by an anonymous donor, and performs like a musician half his age. For this recording of Pictures, he is, in fact, the last "original cast member" from 1951, but it is a testimony to the longevity of his colleagues that three key low-brass players were still present in 1981 when Solti recorded the work for Decca/London, and have only themselves retired within the last several years at ages of 70+

As if that weren't feat enough, this recording also features Scriabin's Poem of Ecstasy, which, within its 20-minute span, is one of the great all-time tests of power, stamina, endurance, and musical expression, for the principal trumpet.

Chandos has exercised professional courtesy in identifying Mr. Herseth in the album credits, along with CSO contrabassoonist Burl Lane, who doubles on saxophone for Pictures' "Old Castle." In crediting principal tubist Gene Pokorny, however, they seem to have made an assumption based on knowledge of what Ravel scored, but ignorance of common practice and what actually took place in Chicago. The particular tuba played in Parisian orchestras at the time Ravel scored Pictures was ideal for the high tessitura of "Bydlo," but this has not always been the case with orchestras elsewhere. It has been more than acceptable practice for "Bydlo" to be performed on the euphonium by a member of the trombone section. With the CSO, principal trombonist Jay Friedman has played "Bydlo" most often over the past 20 years, and does so very beautifully in this recording. Mr. Pokorny, a great player who has recently been appointed to one of the profession's most celebrated tuba chairs, surely has a fine "Bydlo" in him. Perhaps we'll hear it next time.

Crediting the right tuba player for the wrong reason isn't Chandos's only mistake. They utilize the services of Mitchell G. Heller, engineer of WFMT's CSO broadcasts. Aside from the DG crew that struck it rich when they taped Bernstein's Shostakovich 1 and 7, Heller probably knows more about how to tape the CSO in today's Orchestra Hall than all the record company crews put together. So they get Mr. Heller to help them mike the orchestra, then they bring in former StarKist beauty Charley Tuna to add some artificial reverb for "good taste." The reverb on this recording is not so pronounced as on the Schmidt Symphony 2, but it is nonetheless quite obvious.

Unlike the Schmidt, which was live, these two works were taped in sessions following a weekend of subscription performances. With
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four to choose or consolidate from, they would have been better off doing just that, as WFMT did for its broadcast series. Not only did the broadcast sound sound more immediate and natural without Charley tuna's post-production, but the performances were better as well.

Järvi's rubati, underlinings, and telegraphings ahead seem effective somehow in the presence of the public—in a "studio" recording session they seem merely willful and self-indulgent efforts to make "his" Pictures different from all the others.

The Scriabin strikes me as a work which should be heard as a single take, live. The broadcast, if edited from more than one of the performances, has been done very well. The manic, erotic obsessiveness of the music has rarely been better revealed. Mr. Herseth holds forth with his renowned endurance far more effectively on the broadcast than on the recording, during parts of which he is reduced to forcing through waves of fatigue. The final note of Poem, a magnificent C-major chord, is played as a rounded unified high-tension fermata on the broadcast. On the recording, there's a very ugly crescendo at the end of the chord from the trumpet, of all things.

Chandos, can't you get anything right?!?

—Richard Schneider

RAVEL: Miroirs, Gaspard de la nuit
Minoru Nojima, piano.

When I and so many other reviewers lavished praise on Minoru Nojima's 1987 US debut recording of the Liszt Sonata (RR-25, Vol.11 No.4), we risked accusations of gushiness and lapsed critical judgment. Indeed, several commentators I respect wrote very different opinions.1 I remain firm in my enthusiasm for that record, but must confess that it set high and perhaps unrealistic expectations for Nojima's second Reference album, of Ravel pieces.

At times it's hard to believe that this is the same pianist as in the Liszt, playing the same piano in the same hall. Though the Reference people report using the same recording gear in a similar configuration, the sound they capture is notably different, and, intentionally or not, more felicitous to Ravel's music. The Liszt was a recording of sweeping contrasts, generating a solid, powerful sound, then an airy whisper. Keith Johnson captures this Ravel more closely, imbuing it with a pellucid, liquid sense. It's the roundness of Nojima's tone

1 Notably Neil Levinson in Fanfare and Clark Johnson in a private correspondence.
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Argerich’s of *Gaspard*. The latter, also on DG, is a wayward, mercurial statement that has held up beautifully for 15 years. That Nojima’s new record deserves mention in this company bespeaks it as excellent.

Reconfirming Reference as a class act, there is included a fine sly, sendo essay by pianist/critic Harris Goldsmith, and a reprint of the Bertrand poems which inspired Ravel to write *Gaspard*. A rare marriage, this issue: strongly recommended for music lovers, audiophiles, and the literary-minded. —Kevin Conklin

**SCHUBERT: Symphonies 1 & 4**
Roy Goodman, Hanover Band
Nimbus NI 5108 (CD only). DDD. TT: 58:47

**SCHUBERT: Symphonies 3 & 5, Overture in the Italian Style**
Roy Goodman, Hanover Band
Nimbus NI 5172 (CD only). DDD. TT: 58:29

The Hanover Band has gained considerable polish and virtuosity since making its first recordings, and director Roy Goodman is clearly a musician of taste and intelligence. These traits are especially evident in his lively and beautifully balanced account of 3, where winds and brass cut through with telling point and vibrance. Indeed, one of the virtues of these two discs (part of a projected traversal of the Schubert symphonies) is the piquant color of period instruments. Yet despite this and other merits, these performances cannot compete with the best available. For one thing, the recording is far too resonant, the excessive “hang” time often blurring detail that Goodman’s small ensemble would, in better acoustic environs, expose. It’s about time that producers wake up to the reality that All Saint’s Church, Tooting (the site of these recordings) is a dreadful hall for music.1

Over and beyond this fault, it is clear that Goodman’s ensemble has neither the virtuosity nor tonal sheen to match that of other groups. Details are sometimes fudged, and the kind of spit-and-polish precision typical of the finest orchestras is absent. And Goodman himself, for all of his well-intentioned impulses, does not seem to have the authority or insight needed to produce the expressive phrasing, long lines, and highlighting of inner voices that, in the best performances, expose the quintessential Schubert. The nervous intensity of 4, for instance, is often missing, the songful exuberance of 1 somewhat tame, and the cantabile lightness of 5 lost in surprisingly (for a period-instrument reading) thick textures and heavy bass.

As examples of what these works may have sounded like in Schubert’s day, these performances have some value. But they pale alongside those of Karajan (EMI), Marriner (Philips), and Wand (RCA), all of which offer greater expressivity, finer orchestral execution, and better overall sound. Goodman observes all exposition repeats, but wisely eschews gratuitous repeats in the reprise of third movements in each work. —Mortimer H. Frank

**SIBELIUS: Songs, Vol. 1: Opp. 3, 17, 36, 37, 46 No. 4, & 88**
Anne Sofie von Otter, mezzo-soprano; Bengt Forsberg, piano
BIS CD 457 (CD only). Robert von Bahr, eng. & prod. DDD. TT: 57:02

**WOLF/MAHLER: Lieder**
Anne Sofie von Otter, mezzo-soprano; Ralf Gothóni, piano
DG 423 666-2 (CD only). Karl-August Naegler, eng. & prod. DDD. TT: 58:58

Swedish mezzo Anne Sofie von Otter is appearing on disc with amazing regularity at the moment, but this is hardly surprising when you consider her unique brand of highly refined musicality. She brings by turn, both to Sibelius’s Swedish and Finnish songs and the single example in French (“Les Trois Soeurs Aveugles”), just the right degree of simplicity or pathos. This recital is quite a mixed bag: there are strophic and through-composed songs, love songs and lullabies, songs of ample melody, and others that merely develop a single phrase. For those new to this repertoire, it would be fair to say that the contrast in styles and moods is as colorful as a child’s kaleidoscope, but the emotions expressed are far from puerile. Sibelius certainly had something to offer in this genre, and it is pleasing that von Otter goes some way toward rectifying his unjust neglect in this field.

The Wolf and Mahler song selection on DG is much more familiar territory. I would have preferred to hear a few more lively examples from Wolf to offset the gravity of the four *Mignon* songs and “Gesang Weylas,” but there is a refreshing lightening of texture and emotion in “The Tease” and “The Shepherd.” Where there seems to be lack of contrast, this is probably brought about by the uniform way von Otter tackles the slower, more emotional songs: swelling notes in the same way, adding vibrato at predictable points, broadening her tone at a similar juncture in each phrase. Yet there is still an intense beauty and wholesomeness to all these songs that makes them worthy of a hearing—especially in light of their wonderful coupling.

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Von Otter's selections from Mahler's *Wunderborn* songs are full of delightful characterization, *à la* Fassbinder. She can be witty and playful or threateningly forbidding. Also included are two little-known settings from Molina's *Don Juan*, and two of Richard Leander. For each, von Otter's reading is as idiomatic (and therefore as adaptable) as one could hope. Both recordings are perfect in terms of balance and clarity; both are highly recommended.

—Barbara Jahn

**STRAUSS: Tod und Verklärung, Metamorphosen, Till Eulenspiegels Lustige Streiche**

Herbert Blomstedt, Staatskapelle Dresden
Denon CO-73801 (CD only), Claus Struben, eng.; Takashi Baba, prod. DDD. TT: 67:54

**STRAUSS: Tod und Verklärung, Metamorphosen, Drei Hymnen**

Felicity Lott, soprano; Scottish National Orchestra, Neeme Järvi
Chandos ABRD 1374 (LP), CHAN 8734 (CD). Ralph Couzens, eng.; Brian Couzens, prod. DDD. TT: 71:29

It is a particularly interesting and apt exercise to couple *Tod und Verklärung* with the "in memoriam" *Metamorphosen*, written in the twilight of Strauss's own life. Here he was mourning the devastation of Munich in the final months of World War II, but the drive to complete the work after an abortive start was the compounded grief felt at the destruction of both the Dresden and Vienna Opera houses. Written for 23 solo strings, this nearly half-hour-long elegy inevitably invites much interwoven counterpoint. It can become a dry academic exercise, as in Blomstedt's hands, for he concentrates on the letter of the score rather than its spirit. Järvi's interpretive demand could not be more of a contrast. Though not as technically tight, his performance is emotionally much bigger, and surely its warmth and ardor secure just the degree of emotion that Strauss must have felt. The Chandos recording, with nothing to choose between LP and CD quality, is as typically ardent.

Järvi's *Tod und Verklärung* is driven by the same urgency, but its spontaneity is never allowed to dilute the rich sensuousness of its themes and sounds. Blomstedt here shows himself to be the master craftsman from the opening bars: every detail is carefully graded, his soloists are asked to produce only the most beautiful of sounds, and clarity in all things is the watchword. But, as drama builds, it is Järvi who carries you away, engulfed in waves of opulence—to hell with detail here, it's the mood of this music that is all-important.

Järvi's trump card is played by the inclusion of the little-known *Hymnen*, the second of which quotes the childhood theme from *Tod und Verklärung*. These are beautiful but intensely difficult orchestral songs that exalt a love of nature, freedom, and humanity. Felicity Lott, with her thorough grounding in operatic Strauss, is the perfect exponent. She negotiates each virtuosic hurdle with confident if not always easy-sounding assurance, and shows the cycle to be as sumptuous an outpouring as the *Four Last Songs*. Blomstedt, already fighting a losing battle, falls out of the running with an over-relaxed and strangely effete *Till Eulenspiegel*. 

—Barbara Jahn

**SZOKOLAY: Blood Wedding**

Erzsebt Komlossy, Mother; Ferenc Szonyi, Bridegroom; Margit Szilvassy, Neighbor; Andras Farago, Leonardo; Stefania Moldovan, Wife; others; Hungarian Radio & Television Children's Chorus, Hungarian State Opera Chorus & Orchestra, Andras Korodi
Hungraroton HCD 11262-63 (2 CDs only). Janos Marys, prod.; Laszlo Csonatal, eng. ADD. TT: 105:54

From the opening bars of this opera the listener knows he is in the grips of some powerful storytelling. At first the music sounds like Bartók at his most disruptive, then there are hints of early Schoenberg. But then it's time to stop intellectualizing and second-guessing and realize that it's going to be an idiom both familiar and original. There are abundant melodies and much of the music is tonal; only when death is spoken of (or imminent) does Szokolay use the twelve-tone row.

Federico García Lorca's play is a beauty, and it's practically operatic even without music. Alberto Ginastera has written an opera on the subject which I've heard parts of—it evokes pain handsomely. Szokolay never tries to sound Spanish, and this is courageous; indeed, he concentrates on the *universality* of the depth of emotion inherent in the work. The mother is in a state of near-lunacy throughout and the composer sustains it (so does the singer here—remarkably). It's almost too much—it never lets up. This recording (some 20 years old, by the way) made me yearn to see the opera on stage; it must pack a wallop. The third act suddenly stops being earthbound and grows spacey—both the Moon and Death become characters. (The Moon is a tenor whose vocal line hangs out around high A, B, and C; Death is a deep contralto—he's disguised as a bag lady.) It works—that's all I can say.

The performance and recording are about all one could ask for. The stereo separation is a bit artificial (that is, characters who are speaking to one another are not together; apparently this was done to clarify the vocal lines); I have no complaints. The Hungarian language does not trip off the tongue, but short of Lorca's original Spanish, what would? Hungaroton has wisely supplied a booklet with intelligent

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This admirable melange of popular encores of the past (Paderewski's Minuet, "The Swan"), some less-well-known examples (Palmgren, Gabrilowitsch), and Stephen Hough's own expertly conceived and pianistically grateful arrangements (Richard Rodgers, Quilter) is, to my mind, a great fun collection, one to be thoroughly enjoyed when heard either selectively or in consecutive sequence. The weight of the repertoire rests on the many favorites of so many pianists of yesteryear, and the 29-year-old prize-winning Englishman has obviously got those performers' sounds and styles very much in his blood. In all ways, this is brilliant, scintillating playing. The piano reproduction is extremely even but rather too distant for any ideal representation of color and intimacy, this perhaps being the only criticism that one could level. Overall, however, if the term "a good read" is an acceptable one to describe a book to be savored, Stephen Hough's album just as surely deserves to be called "a good listen."

—Igor Kipnis

**Show Music**

**BOSTON POPS ON BROADWAY 1990: Music of the Night**

John Williams, Boston Pops Orchestra

Sony SK 45567 (CD only). Thomas Z. Shepard, prod.; Bud Graham, eng. DDD. TT: 72:39

The package from Santa Fe contains five CDs: some more stuff by Kurt Weill, Frederica von Stade singing pop, and this one. Wait, there's a note on it from RL: "Not for review. Unless...?" Makes sense; Richard knows I find Pops arrangements of show music to be generally tepid, lacking in theatricality. Good thing he didn't ask me to do a review. Might as well play it, though. Hmm. "Everything's Coming Up Roses" sounds a bit like elevator music. Advance to track 2: "No One Is Alone," from Into the Woods. Lovely arrangement, especially the use of strings. Let's see who did it. Ahh! Angela Morley, arranger for Lerner & Loewe's highly underrated movie version of The Little Prince. Talented woman. A Bernstein medley is next. "New York, New York" drags. Wake up, guys! Andrew Lloyd Webber gets his turn—"Don't Cry for Me Argentina" arranged like a cross between Ravel's Bolero and the "Theme from Bonanza." Morley did not do this one.
Skip to "Miss Saigon." At least they're up to date; Miss Saigon is coming to Broadway next season. Great arrangement, sounds a lot like the London original. Ah, no wonder—it's by William D. Brohn, the show's own arranger. Also, the sound seems a lot smoother than the usual multitracked digital job. What's this small print—"For this recording 20-bit technology was used for 'high definition sound'?" I suppose this means that all previous CBS releases were in low-definition sound. Now they tell us! Does sound good, though. Better give it the full CD-tweak treatment: CD Stoplight green paint around the edge, Monster Soundring. The sound is even more open, more dynamic. Quite terrific, in fact. Not spectacular in the overhyped hi-fi sense, but with a lot of subtle detail. Natural timbres, nice sense of space. Maybe 20-bit technology (whatever that means—probably new A/D converters) does make a difference. Let's see what they've done with "Love Changes Everything," from Aspects of Love. Interesting: some of those inane lyrics, the tune is really not half-bad. Gorgeous sound. And there's still "Music of the Night," from Phantom, arranged by Morley. Maybe I should review this record. Richard, what do you think?

—Robert Deutsch

**Jazz**

STEPHANE GRAPPELLI: My Other Love
Stephane Grappelli, piano
CBS MK 46257 (CD only). Paul Goodman, eng.; Thomas Frost, Bob Thiele, prods. DDD. TT: 53:51

STEPHANE GRAPPELLI: May Fools (Soundtrack)
Stephane Grappelli, violin; others
CBS MK 46256 (CD only). Henri Renaud, Conseiller musical. DDD. TT: 49:52

Although the violin has never found a solid niche in the jazz mainstream, such fiddle masters as Joe Venuti, Eddie South, Stuff Smith, and Stephane Grappelli have demonstrated that the instrument can be a compelling jazz voice. Indeed, Grappelli—who first attained international prominence for his collaborations with guitarist Django Reinhardt in the early 1930s—continues at 82 to captivate audiences around the globe with his ebullient, swinging style.

My Other Love, however, is dedicated to another side of Grappelli's artistic personality, that of solo pianist. Not that his pianistic talents have exactly been kept under wraps in the past; during live performances he often lays down his bow to back up other soloists at the keyboard. But here, for the first time on record, he performs alone—a setting that severely challenges any improvisor's inventiveness and ability to sustain a listener's interest. While the undertaking is certainly both admirable and heart-warming, I must admit that the outcome impresses me more as a valuable historical document than as a memorable musical experience.

A major surprise is the extent to which Grappelli's string and keyboard approaches differ: the former is typically of the uncomplicated swing variety with few extra notes, while the latter is extremely florid and consistently pays homage to the influence of Art Tatum. In Grappelli's hands, all of the 15 songs (standards like 'Ain't Misbehavin',' 'Time After Time,' "Tea for Two," and "Satin Doll") surge and sway with rubato, often settling into a swinging, abbreviated stride groove. During the rubato segments melodic lines are copiously decorated with trills, runs, tremolando, and arpeggios: if Grappelli does not possess the finesse and lightning touch of Tatum (who does?), he is nonetheless impressively fleet of finger. That fleetness, however, results in textures that generally seem more rhythmically busy than vital and involving. And there's even less happening below the surface despite some sensitively honed moments, most notably in "Two Sleepy People," "A Foggy Day," and a rousingly energetic "Tea for Two." Three of the selections are Grappelli's own, the best of which is the appealing, minor-mode "Jaqueline."

Although the piano sound is a bit on the brittle side, there's a good sense of presence; I particularly appreciate the realistic localizing of the sound source in contrast to the many recordings in which the piano keyboard appears to stretch from one side of the room to the other. In all, this CD makes for pleasant if not very absorbing listening. It should be of particular interest to stalwart Grappelli fans.

Asked by director Louis Malle to write and perform music to his film comedy May Fools, Grappelli found himself on the more familiar terrain of violinist and composer. The soundtrack CD contains 17 (mostly) brief segments of the score, written for chamber-size jazz ensemble. No knowledge of the film is necessary to savor the combination of nice tunes and fine solo contributions from Grappelli, guitarists Marc Fosset and Martin Taylor, and pianist Maurice Vander. In addition to Grappelli's original music, his arrangements of "Tiger Rag" and "L'Internationale," guitarist Fosset's Brazillian-undertoned "Pic-Nic" and Moret-Barde's "La Fille du Bedouin," also integrated into the film, are included here.

The octogenarian violinist's playing is as masterful as ever, a compelling mirror of his years of experience and deep roots in the music of the '30s and '40s. The harmonic and melodic sense of his writing is much closer to the present, however, ranging from such lush and
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lovely entries as “Fly-Tox” and “Rivere” to the
straight-ahead stomper “Adele.” In contrast to
Grappelli’s swing-inspired improvisations, Fos-
et, Taylor, and Vander are neo-boppers to the
core, each turning in several facile but imagina-
tive solo moments. An accordion adds an oh,
so French touch to “Valse du Passe” and “In-
ternationale.” Unfortunately, it sounds as if it
were recorded in an empty rail terminal and
pasted in later. The recorded ambience in
general is somewhat larger than life, which,
depending on how disturbed you are by such
“enhancement,” should not intrude very heav-
ily on your enjoyment of good, mainstream
swinging that not infrequently grabs your full
attention.

—Gordon Emerson

CHARLES LLOYD QUARTET: Fish Out Of Water
Charles Lloyd, tenor sax, flute; Bobo Stenson, piano; Palle
Danielsson, bass; Jon Christensen, drums
ECM 1398 (841 088-2). TT: 57:50
KENNY WHEELER QUINTET: The Widow In The
Window
Kenny Wheeler, flugelhorn, trumpet; John Abercrombie,
guitar; John Taylor, piano; Dave Holland, bass; Peter
Erikse, drums
ECM 1417 (843 189-2). TT: 61:17
Both: CD only. Jan Erik Kongshaug, eng.; Manfred Eicher,
prod. DDD.

This pair of recent ECM releases brings us new
music from two master musicians who have
not been studio leaders for some time—more
than ten years for Lloyd, seven for Wheeler.
That seems far too long, but if it takes that kind
of time to come up with what Lloyd and
Wheeler have to say on Fish Out Of Water and
The Widow In The Window, then perhaps
most other jazz musicians—and fans—have
much to learn about patience.

After “discovering” Gabor Szabo, Keith Jar-
rett, Cecil McBee, and Jack DeJohnette, and
after selling more than a million copies of his
1967 “crossover” album Forest Flower—jazz
even hippies could love—Charles Lloyd
dropped out of the music scene in 1969 to
spend most of the next 20 years in meditation
and other spiritual pursuits. He emerged briefly
from Big Sur in 1982 to make two live record-
ings with French pianist Michel Petrucciani, but
there’s been little since then.

But as serendipitously as Forest Flower cap-
tured a strange confluence of musical and cul-
tural genres at a strange time in America, Fish
Out Of Water is a far finer, wiser work—in a
word, it’s Lloyd’s best. This new date teams
Lloyd’s shifty sax, creamy and troubled by
turns, with three-fourths of the Bobo Stenson
Quartet. This is surely one of jazz’s finest and
most underrated rhythm sections, right up
there with those of Miles (Garland/Cham-
bers/Joe Jones, Hancock/Carter/Williams),
Coltrane (Tyner/Garrison/Elvin Jones), even
Brubeck (Wright/Morello). Stenson’s hand has
played together, on and off, for 20 years, and,
sans Stenson, formed the rock over which
purlled Keith Jarrett’s piano cascades in Jarrett’s
“Belonging” recordings. The effortless, egoless
bass of Palle Danielsson consistently disapp-
ears; one hears so much what he doesn’t
play—an essential absence. Jon Christensen
remains one of my all-time favorite drummers:
spare, delicate, full of crunch when that’s called
for, full of nuance and silence when it isn’t. And
with Bobo Stenson’s own clarity without brit-
tleness, intelligence without grandstanding,
and pulse without push, it all adds up to wise,
weathered, world-class trio playing.

Fish Out Of Water should silence all those
who’ve mumbled over the years that Lloyd
OD’d on OMsthis is timeless, peerless, ex-
cellent music, and Lloyd’s chops seem to have
only improved through disuse (compare his
lively but ragged work on Chico Hamilton’s
1965 Man From Two Worlds, for example). The
first and title cut is the spirit of Lloyd’s origi-
nal “Forest Flower” raised far beyond that early
composition’s almost too-easy, unexamined
peace; one hears the maturity, the grace, the
implicate order of each moment met, appraised,
and acted upon in serial singularities of con-
flated time and space. And to those of you for
whom the label “New Age” connotes flaccid
complacency and unadventurous pseudo-
music, or who might even have heard Lloyd’s
mid-’70s Beach Boys recordings—“New Age”
music this is not.

“Haghia Sophia” is an aptly modal cloud of
atmosphere à la Jarrett’s “Oasis” on Nude Ants
(also with Danielsson and Christensen). After
a long intro, “The Dirge” falls into a slow,
bluesy swing, Lloyd wailing while perfectly in
control. “Bharati” is sultry, sexy, a jazz Sbe-
berezade, Lloyd’s sleek playing as full of blood
as a vampire’s wetdream. And after he’s done,
the rhythm break is a study in the possibilities
of jazz-trio telepathy.

“Eyes Of Love” could be an instant standard,
music for quaffing cocktails at God’s own bis-
tro. But things do heat up with rumblings from
Below—after a long layout following his false
start, Lloyd rides larger and larger swells until
he floats in an unexpected calm.

I’d say that Fish is a Forest Flower for the
’90s, but too many hard-core jazzers would
take that to indicate a lack of substance and
dge. They’d be wrong. Lloyd’s chops are just
rough enough to keep things interestingly on
that edge, as does his trademark trick of long,
sustained tones preceded by restless arpeggios
(as in the first bar of “Forest Flower” itself). The
music is smooth without being slick.

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Fisb... is tender, gentle, loving, well-seasoned jazz that refuses to lose itself in glib platitudes. The compositions—all Lloyd's—are strong; as I listened, I constantly had the impression that Lloyd was playing definitive versions of standards I couldn't quite put my finger on. Fish Out Of Water is probably the most inaccurately titled jazz album in history—at 52, Charles Lloyd is fully submerged in his element.

Kenny Wheeler is now 60, believe it or not, and The Widow In The Window is only his fifth album (as a leader) in 15 years. My, but it was worth the seven years since Double, Double You. Look at the band: John Abercrombie, John Taylor, Dave Holland, Peter Erskine—and that's just the core-group of Kenny Wheeler's 19-piece Large Ensemble, whose recording (also on ECM) may even have been released by the time you read this.

With the exception of his first, Gnu High, Kenny Wheeler albums (Deer Wan, After 6, Double, Double You) listen like Knut Hamsun novels read: darkly brooding, with hints of menace amid great tenderness. Wheeler fully experiences each note before he plays another. His fluegelnorn/trumpet voices are lonely, mournful without being lugubrious, awesome in the elegiac finality of his never-busy statements over constantly shifting chordal foundations. His music always seems suspended, harmonically and metrically—it floats with tensile strength, as if sprung—a melancholy bouyancy, with absolute control of tone and dynamics. Like no other music but Sibelius's, Wheeler's spare sounds remind me of the northern seas—cold, grey-green, not to be treated lightly, with huge, dark shapes of tragedy always moving dimly beneath the surface. Reflective, sad, remarkably intelligent music that demands to be taken seriously.

Of the six cuts that comprise Widow, the first four, longer ones are the meat. The longest (14:43), "Ana," after a climbing, mounting introduction, breaks off for a bass meditation by Dave Holland; then the band enters for a long ensemble passage topped by Wheeler's keenig trumpet. John Taylor's crystalline piano reprises the intro, the pace slows, and the band seems to recall what they've just been playing, this time reflecting in sorrow.

"Aspire" lets John Abercrombie swing a little more straightforwardly than usual, while "Ma belle Hélène" sails with smooth, quiet urgency under a cool, urbane, steel-and-glass Taylor solo. The title cut's arching, arching primary theme, and the floating-in-place ensemble work that follows, with Wheeler's hot-brass squelches in places where other bands don't even have places, is tropical heat unsodden by monsoon humidity.

"Hotel Le Hot" similarly simmers rather than sizzles, though it's still the most uptempo cut here; and most like what Wheeler's done on the Dave Holland Quintet recordings released in the '80s: Jumpin' In, Seeds of Time, and The Razor's Edge. And "Now, and Now Again"'s sprung balladry is as close as Wheeler gets to whimsy or standards.

But the tunes drift in and out of each other on first or second listening; it takes a few hearings to first take them apart, then reassemble them in one's own aural image. This is music you can marry.

It's great to hear Peter Erskine, an excellent drummer who doesn't always play so, percing with more restraint and judiciousness than he often does. Dave Holland plays the Yggdrasil bass3 Jack Casady of the Jefferson Airplane always claimed for himself. John Taylor—who, with Wheeler and Norma Winstone, makes up Azimuth, an ECM trio with three albums—chooses his notes with exceeding care. Only John Abercrombie seems a bit out of place, if only for his electric guitar's relative crudity of tone in this sumptuously (if not accurately) recorded, otherwise acoustic, session.

But that's the merest quibbling. The Widow In The Window constitutes a working definition—or paraphrase—of jazz as the purest music, the soul of poetry, a schematic of taste. Remarkable.

Both of these discs receive the usual round, fat, reverbd, multi-miked ECM treatment4 guaranteed to sound perfect on harsh, hashy, mid- to low-fi systems. If I wanted a technically inaccurate recording, I'd want Manfred Eicher to produce it. Such a production style is hardly contradicted by my velvety Vandersteen 2CI's, but my taste admittedly runs to the mellifluously euphonic anyway. Nothing wrong here.

—Richard Lehnert

BRANFORD MARSDAL QUARTET

Branford Marsalis, tenor & soprano sax; Kenny Kirkland, piano; Robert Hurst, bass; Jeff "Tain" Watts, drums. Mo' Better Blues only: Terence Blanchard, trumpet; Cynda Williams, vocal

Mo' Better Blues (Soundtrack)

Columbia CK 46792 (CD only). Larry DeCarmine, Patrick Smith, Rob Hunter, engs.; Bill Lee, Delfeayo Marsalis, Raymond Jones, prods. ADD, DDD. TT: 37:45

Crazy People Music

Columbia CK 46072 (CD only). Patrick Smith, Tim Gee, lan, engs.; Delfeayo Marsalis, prod. DDD. TT: 64:37

3 Yggdrasil is the ash tree in whose branches nests the world, for those not up on their Teutonic mythology.

4 In the liner notes to the Kenny Wheeler album, Steve Lake calls this "a clear-eyed understanding of the differing demands of the concert platform and the studio." Of course, an audiophile would point out that there's no reason other than convenience to use a studio at all, but I can live with producer Manfred Eicher's aural vision. In fact, I do.

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Branford Marsalis’s soundtrack to Spike Lee’s recent film *Mo’ Better Blues* has about half a short album’s worth of music you’d want to hear more than once. The other half consists of two barely differing five-minute versions of W.C. Handy’s “Harlem Blues” sung by musical and dramatic newcomer Cynda Williams. But, as so often happens in films about jazz, she ain’t singin’ jazz. Williams falls somewhere between the pop sensibilities of Laura Nyro and Liza Minnelli, with a lot of Broadway belt thrown in; okay if you like that sort of thing. There’s a long piece of quasi-Rap about jazz, while “Pop Top 40,” Denzil Washington’s mini-revue of Top 40 radio incorporating Spike Lee’s contempt for “love songs,” worked a lot better on the screen.

What’s left, besides two pleasant but sentimental compositions—one for jazz quintet, one for orchestra—by Lee’s father Bill, are three too-short tracks with Branford Marsalis’s current quartet, trumpeter Terence Blanchard sitting in. It’s great to hear Branford playing with a trumpet again—first time since he left Wynton’s band. “Say Hey” features Marsalis with his Wayne Shorter mask on, “Knocked Out the Box” has some great, wild squawling by Blanchard, while “Beneath the Underdog” twists through many mercurial changes in its mere five minutes.

Three or four different producers had their ways with this record, but the results are monochromatically mid-fi: little or no soundstage, multi-miking, you’ve heard it all before.

What you’ll wish you *bad* heard before is the intensity of Branford’s new *Crazy People Music*, a straight-ahead, no-quarter, D9 Caterpillar bulldozer of an album. After the tone—dark, noble, deadly serious, awesomely accomplished—is set with Marsalis’s own “Spartacus,” the mood is continued with bassist Robert Hurst’s “The Dark Knight,” a long, mournful jag of restless grief; Branford’s solo is probably the best non-ballad work he’s ever done on record, while Kenny Kirkland’s piano chimes bluey. Hurst’s intonation and strength and solidity of tone are marvels—he sounds like a huge player.

Marsalis calls his “Wolverine” “sort of an Ornette-type tune,” and no one will disagree, except that I’d much rather hear Branford do it than Ornette. Kirkland’s demonic syncopations are breathtaking—McCoy Tyner without the bombast—and surprise even Marsalis, who makes it back to his mike late. Full of skewered crazy people humor—grab the ending.

The edge is danced on even more wildly with “Mr. Steepee”; the tenor/drums break is mathematical passion; the whole tune reaffirms my wonder at the miracle of jazz, of human beings creating music of this quality at this speed at this level of commitment.

“Rose Petals” is Keith Jarrett’s 1975 tune (from *Shades*) wailed as Dewey Redman never could. In fact, this is a superior version in every way, each musician far more mature than were KJ and his band in ’75. Kirkland solos à la Rachmaninoff toward the end, and, all in all, this goes Branford’s Jarrett/Garbarek tribute on *Random Abstract* (“Lonely Woman”) one mo’ better.

The version here of “Random Abstract” is almost as furious as the one on *Trio Jeepy*; this time it’s Kirkland’s strut, lines running long, abandoned when an even better idea explodes, with Stravinskian chordal blocks over Marsalis’s ferocious horns. And it’s not free blowing. We’re finally allowed to relax that creative tension with the final cut, “The Ballad of Chet Kincaid,” by Quincy Jones and, yes, Bill Cosby—straight late ’60s Bluenote-style blowing.

Producer Delfeayo Marsalis gives us his standard immaculate if sterile sound, but he’s improving, as proved last year by the entirely acceptable sonics of *Trio Jeepy*. Except for the piano, the instruments are full-bodied, even if you’ll be endlessly frustrated as to just where in the “soundstage” those bodies are.

Still: state-of-the-art jazz by men who love the music so much it hurts. Recommended? Very... but keep $15 handy for Bunky Green’s *Healing the Pain* (review on the way).

—Richard Lehnert

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**BOB DYLAN: Under the Red Sky**

Columbia C 46794 (LP), CK 46794 (CD). Ed Cherny, eng.; Don & David Was, prods. AAA/AAD. TT: 35:31

I didn’t buy this album the day (9/11/90) it came out because I was standing in line with JA and his wife, Laura, trying to scalp a $30 ticket for Bob Dylan’s Santa Fe concert. I shoulda stood home.

Dylan performed not one song from *Under the Red Sky*—not a bad idea, as it turns out—and sang only “Man in the Long Black Coat” from last year’s vastly superior *Oh Mercy*. Other than that, it was a phoned-in two-hour greatest hits package. Most of the time I stood on my bleacher seat fuming at this arrogant little creep as he galloped lines and dropped whole verses on nearly every song. I’ve never attended a more cynically performed concert—it seemed inconceivable that any of these songs (with the possible exception of “Long Black Coat”) could mean anything at all to someone so spiritually absent. The delirious audience
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seemed to be applauding the skinny, black-suited, black-booted figure for wearing the correct period costume and simply surviving long enough to give a concert in—gasp!—1990. Sorry, not enough for me. Dylan had a lot more to say when he didn’t say nearly as much.

All of which made me hope even more that Oh Mercy had not been a fluke, that Under the Red Sky would continue Bob Dylan’s reawakening to himself. I was disappointed, to put it mildly.

Red Sky's best lyrics superficially resemble those of the batch of 1967 songs represented on disc by The Basement Tapes, but don’t be fooled. Though “Unbelievable” may sport lines like “Kill that beast and feed that swine,” “The Last of the Days” is a plain musing about an unashamed AAB blues that sound like Dylan mumbling in his sleep during a pretty interesting dream, but I think you had to be there. “TV Talkin’ Song” is about listening to some soapboxer haranguing a Hyde Park crowd about—surprise—the evils of TV; there’s a riot, then Dylan’s unbelievably pat, lame, cynical conclusion of “Later on That Evening, I Watched It on TV.” Christ. Dylan’s attitude throughout the album is summed up in “Born in Time”: “No more of this, Takes too much time, takes too much will, It’s too revealing.” Right, Bob. Gotcha. Not a hint of irony, either.

Yes, yes, yes, George Harrison, Stevie Ray & Jimmie Vaughan, Robben Ford, David Lindley, Elton John, and David Crosby are all here—even Al Kooper (!), giving the album its only thrills with his patented Bob Dylan “Rolling Stone” piano/organ rolls—but such star turns almost always bode ill anyway. Lowest common denominator time.

Still, Red Sky is not a total waste of time. “10,000 Men” is in the bluesy tradition of “From the Back of a Buick 6,” and the album’s best song, “God Knows,” is humbly about what God knows and what Bob doesn’t. Bob’s best work has been about God for ten years now anyway.

Musically and sonically, the album is mush. The Was boys have given us a super-processed tape of Dylan’s usual off-the-cuff studio noodlings, and the CD’s vocals are pretty harsh compared to the LP.

Word has it not only that Dylan returned to Columbia after two albums’ worth of asylum on Asylum because CBS had threatened to release the Royal Albert Hall concert, but that it also took CBS years to talk him into releasing The Basement Tapes, which Dylan never much liked. So what gems does Dylan want to give CBS? Down in the Groove, Knocked Out Loaded, Real Live, Live at Budokan, Under the Red Sky. I could go on. Dylan shouldn’t. Does he need the money that badly?

—Richard Lehnert

RONNIE HAWKINS & THE HAWKS: The Best of...
Rhino R2 70966 (CD only), James Austin, prod. AAD. TT: 45:13

Ronnie Hawkins, a genuine rockabilly, Elvis was in the Army and Ronnie was up in Toronto, isolated like some lost B-movie jungle full of Rockabilly records, things downtown. With the Hawks, the band was two Arkansans and four young Canadians fighting the not-so-hot fight against Canadian winters and honkie reticence, avoiding starvation and stardom with about equal success.

What we got here, in painfully harsh AAD (except, miraculously, for the two best tracks), is 15 cuts of pure GI Rockabilly juiced with 1 jigger of R&B, 1 of stoned-out 1970 Muscle Shoals funk, and 2 of absolute crazed gonzo classic rock’n’roll. Listen and ye shall hear.

Colin Escott’s copious liner notes and David Booth’s Rhythm Records (whose archives Rhino has recently bought) “Sessionography” are strangely non-committal about just exactly which tracks which members of The Band play on, but I think I’ve got a handle on it. (Thanks to the Third Edition of Greil Marcus’s Mystery Train—the best book ever written about American popular music—and Rob Bowman’s excellent liner notes to The Band’s 7 Kingdom Come compilation.) Levon drums on 17 of the 18 tracks (the last, the 1970 “Down in the Alley,” features a Duane Allman “so ripped he couldn’t remember doing the session,” sez Ronnie; Garth doesn’t play on any; and the other three play on the 8 later tracks (9/59–3/63). King Curtis blats classically on “I Feel Good,” and there’s one early original tune each by Levon (“Baby Jean”) and Robbie (“Hey Boba Lou”), the last of which is sorta neat in a minor-keyed, re-heated Elvis kinda way, though no hint, no way, of the Great American Songwriter/Guitarist to come.
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No, you have to wait until 1963 for any of that, when Hawkins released the double-barrelled single “Bo Diddley”/“Who Do You Love.” Here’s where you find out why Dylan wanted these kids to back him on his 1966 tour; here’s where you find out what Zimmie meant by “that thin, wild mercurv sound”; compared with the 1959 “Hey Boba Lou,” here’s what’s meant by “development,” “growth,” “chops,” “energy,” “balls”; and here’s what Robbie meant when he said, “We had one thing on our minds: Stomp.”

“Who Do You Love” is an ass-kicker, mean music all the way to the end of the fade. Ronnie & the Hawks sounding like some primeval rock band that somebody with a tape recorder was just lucky enough to stumble on. I mean, these guys sound way too tough to even bother about anything as wimpy as recording. This is some of the most vital, elemental, direct rock’n’roll I’ve ever heard. And these two tunes, the only ones on the album in glorious mono, are also the only ones that sound live in the studio. Or barn. Or cave, primordial soup-kitchen, whatever. Robbie’s guitar is so distorted, so tortured on “Who Do You Love” that you can barely hear the pitches. But who cares about pitches? As some old Appalachian bluegrass banjo master once said when asked what notes he was playing on a particularly tasty lick, “Notes? Ain’t no notes on a banjo—you just play the damn thing.”

To his everlasting credit, Ronnie Hawkins rises to the occasion with his best-ever recorded vocal on “Who Do You Love,” matching Dylan’s future Royal Albert Hall” “No Quarter!” Kommandos of only three years later yel for throat-shredding rebel yells in a stone rock masterpiece. Forget Hawkins’s middle-aged camel-walk buffaloery on The Band’s film/album The Last Waltz—this is the real thing, by a pack of desperate rockers with nothing to lose. Rock hasn’t gotten any more vital than this ragged glory in the intervening 27 years. Worth the price of admission for this 2:41 alone. Recommended? Gimme a break.

—Richard Lehnert

**TANITA TIKARAM: The Sweet Keeper**
Reprise 26091 -1 (LP), -2 (CD). Peter Van Hooke, Rod Argent, prods. DDA/DDD. TT: 47:37
Tanita Tikaram’s voice is husky, dark, and disconcerting on first hearing, seemingly alien to the girl peering out from behind the stone column on the album’s cover. As you settle into the music, you become more comfortable, the voice fitting the persona.

Tikaram is an extremely talented musician. In addition to her singing and guitar playing, she wrote the music and lyrics and helped with the arrangements on this, her second album. Production is excellent, thanks to Rod Argent and Peter Van Hooke. They know when to keep their hands off the controls. As a result, the music speaks in direct, immediate, often terse terms. For example, “It All Came Back Today,” an elegy for lost love, is simply scored for flute, accordion, violin, and acoustic guitar. The introspective, bittersweet tone of the song is heightened by the sensitive accompaniment. Mitch Dalton’s insistent guitar forms the foundation on which the tale is told; the flute, violin, and accordion add the exclamation marks. Captured in intimate sound, the song is compelling and grabs your heart-strings.

Tempo and mood change on “Sunset’s Arrived.” Mark Isham sits in on this one, his influence unmistakable. The trumpet patterns remind me so much of his work with Van Morrison, as does the bouncy groove. This tune works. So does “Love Story,” a bass guitar/vocal duet. John Giblin’s bass line (step aside, Rob Wasserman) is stunning, the perfect accompaniment to Tikaram’s wistful vocal. Sonny Landreth’s tasty bottleneck licks put the finishing touches on an involving performance.

Tikaram pulls out the stops on “Harm In Your Hands,” the album’s closer and my favorite. From the first synth notes you know you’re in for an epic. The song starts slowly, quietly, Mark Isham’s Harmon-muted trumpet weaves in and out of the vocal tapestry, the room awash in delicate soundscapes. The atmosphere created by this arrangement is thick enough to slice. The gears shift when drum and guitar are subtly added, and what started out as a melancholy tone poem is transformed into an upbeat, rollicking celebration, all involved going full-tilt.

Without a good recording, it would be harder to appreciate the skill with which the arrangements are put together. Fortunately this recording, one of the better popular recordings I’ve heard lately (thanks to Simon Hurrell’s engineering), does not disappoint. Bass is exceptional: extended, tight, and palpable (John Giblin on “Love Story,” for instance). The midrange is fine (check out the Kreisler String Orchestra), the treble pristine, with instruments suspended on their own cushions of air. Soundstaging is convincing, with good depth and often startling three-dimensionality (listen to the separation between Tikaram and the acoustic guitar about 3:00 into “Harm In Your Hands”). The unique quality of Tikaram’s voice is captured well, each nuance of its sultry, throaty character revealed through the close

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miking. Tikaram's humming toward the end of "It All Came Back Today" is especially lifelike. Her presence in your room should be holographic.

If you're looking for relief from the pabulum which passes for popular music these days, check out The Sweet Keeper. Real tunes dealing with real-life experiences in a sensitive, unique way spell involvement. Add intelligent production and quality recording, and you have a recipe for success. I hope Tanita Tikaram gets the exposure she deserves. The world of popular music will be the better for it. Highly recommended. —Guy Lemcoe

VARIOUS ARTISTS: Hard Cash
Special Delivery SPDCD-1027 (CD only). Johnny Q. James Saunders, Dave Kenny, engs.; Richard Thompson, Peter Filleul, prods. DDD. TT: 46:23

Don't you just hate reviews that start, "God knows how you'll find a copy, but . . ." and end "...the best album I've heard all year." Well, here comes another one. But this time there's a happy ending.

Nat Hentoff once said, "You know you have a genuine social movement if there are good songs to go with it." Well, if that's true, Margaret Thatcher had better begin making her retirement plans. This soundtrack album from a BBC documentary series about the British economy pulls no punches, and the thoughtful, fervent songs about work, money, and the often tenuous relationship between them are aimed squarely at No.10 Downing Street.

The album opens with this thought from Richard Thompson's "Time to Ring Some Changes": "This old house is tumbling down! The walls are gone but the roof is sound." That's a line Woody Guthrie would have been proud to sing; it establishes the album's balance between irony and anger. The fellow folkies Thompson enlisted for the album admirably follow that lead.

Unlike so many musico-political statements which are long on passion but short on logic, Hard Cash is refreshingly free of polemics. These are people songs, not about overthrowing the government or rioting in the streets, but about the work-a-day goals of a fair wage and a decent place to live in exchange for a hard day's work. Cuts like June Tabor's version of "The Jute Mill Song" dramatize the quiet dignity of that struggle and the human cost of falling short of that minimum standard.

The artists know that this national disgrace leaves plenty of blame to go around, and they dole it out carefully. One by one, the singers tackle the issues, from supply-side economics (Clive Gregson's "The Great Provider"), to education (Ron Kavana's "Living Wage"), to crime, petty and otherwise (Thompson's "Dear Mrs. Rita" and Michael Marra's "Guernsey Kitchen Porter"). As for the other side of the story, the singers frequently assume the voices of the powers that be, simultaneously acknowledging and dissecting the counter-arguments.

But Hard Cash doesn't absolve the working men and women of responsibility for their own plight. Songs like Clive Gregson's "Good With My Hands" take issue with the self-pity and apathy that got many workers into this mess in the first place. And worst on the album's succession of sinners are the "self-made men" who've risen up from the working class and now rather like being exploiters instead of exploitees.

The musicianship more than matches the quality of the songs. Thompson and his trusty Stratocaster chip in with tasty solos and fills on 10 of the 14 tracks, and bassist Andy Brown and ex-Fairport drummer Dave Mattacks hook up nicely. The sound quality varies from cut to cut: Purely acoustic artists like Kavana, Martin Carthy, and the Watersons are recorded cleanly and without gimmicks, but on the more heavily produced numbers, particularly Thompson, the sound is a bit wet; Mattacks's drum kit sounds like a Linn drum, all attack and no texture. But if the producers indulged in a bit too much knob-twiddling, the processing power never intrudes on the music. Both CD and LP preserve the generally excellent sound quality, but I give a narrow edge to the vinyl, which has slightly more detail and a better-defined soundstage.

While Hard Cash is an album about British problems by British artists, don't think it doesn't apply to us. Change the references and the same stories could refer to the working stiffS of the Reagan/Bush years. Maybe it's only a matter of time before we get a little social movement going here, too.

Now for the payoff. After a couple of months of living with the CD and debating whether I'd inflict this review on you, I came across a small cache of copies at the Greenwich Village Tower Records. Folk buyer Tom Cochran tells me the album is available through Tower's mail-order department (692 Broadway, New York, NY 10012) at $9.44 for the LP and $13.99 for the CD. Add $3 for shipping, and New Yorkers kick in the appropriate sales tax. Order it. Now.

By the way, if anyone from PBS is reading this, how about a broadcast of the documentary that inspired this terrific music?

6 Isn't it is delicious irony that the company that reinvigorated vinyl playback in the '70s and the company that emasculated recorded rock in the '80s share the same name? —JA

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I stood in front of the bin of bargain CDs in the classical department of my local Tower Records with what must have been an astonished look on my face. The display had been there for some time, apparently, but I hadn’t noticed it on prior visits. At least two dozen titles were there, from an unknown (to me) label called Laserlight. They encompassed a broad spectrum of light classics (some would say “warhorses”), although a Mahler 1 and several Beethoven symphonies were included. I was floored by the price—$3.44 per disc! Impossible, I thought. There’s gotta be a gimmick.

We’re constantly reminded (or should be) that things which seem too good to be true usually are. But the only gimmick I could find was the use of recordings of little- or lesser-known orchestras and conductors, though not in all cases. All of the discs come packed in standard jewel boxes (no cheap cardboard liners), have decent artwork, program notes (with one exception in the five reviewed here), and are

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Thomas J. Norton

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Laserlight 15 503. TT: 63:00

**MENDELSSOHN: Symphony 4 (“Italian”); A Midsummer Night’s Dream**

Laserlight 15 526. TT: 64:00

**VIVALDI: The Four Seasons**

Also: Concerto in C for Mandolin, Strings, and Basso Continuo, RV 425; Concerto in d for Oboe, Strings, and Basso Continuo, RV 454; Concerto in C for Two Trumpets, Strings, and Basso Continuo, RV 537

Laserlight 15 518. TT: 64:00

(Delta Music, 2275 S Carmelina Avenue, Los Angeles, CA 90064, Tel: (213) 826-6151)

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1 According to my Norton’s Unabridged Dictionary, a classical “war horse” is a piece of music so popular with audiences that it is almost never played in a live concert.
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all digitally mastered. The latter, of course, guarantees nothing except fairly recent recordings. A 30-year-old recording of, say, the Chicago Symphony or Vienna Philharmonic has genuine historic value for a broad audience, but a 30-year-old performance by the Plovdiv Philharmonic (one of the orchestras represented here) might be of less interest, except perhaps to Plovdivians. And, last but not least, all of these discs have generous playing times—clearly marked on the front cover (an example of honesty in packaging that I applaud and challenge full-priced labels to emulate). The longest disc—not one of those reviewed here—was, at 69 minutes, close to maximum capacity for a CD.

Still, the important stuff—performance and sound—could hardly be judged standing around a display rack, so I decided to take the plunge and risk seven bucks on two of the recordings. What I heard aroused my reportorial instincts and convinced me that a written review was in order; I purchased three additional discs to obtain a more representative sampling.

A telephone call to Delta Music, the Los Angeles based distributor of Laserlight (and also of the better-known Capriccio label) provided me with additional information and confirmed some impressions garnered from a close inspection of the liner notes and disc labels. The engineering and artwork is done in West Germany (the program notes are in German and English), but the discs sold in the US are manufactured here. Many of the recordings are licensed from existing tapes, after quality-control checks by Laserlight engineers. The low cost is made possible by lower royalties to the less well-known artists involved and by the decreasing costs of CD mastering and manufacture.

The potential market for these recordings is broad, ranging from the serious collector filling gaps in his or her collection for a small monetary outlay (or perhaps wanting to sample the work of the artists represented) to the nonclassical listener getting a taste of unexplored musical terrain on the cheap. As a contributing editor for hardware (and a bit out-of-water mucking about in the music-review columns), my criteria for evaluating these recordings did not extend to judgments concerning the definitiveness of the performances (or lack of it). Such pronouncements seem a bit pointless in any case, considering the price. I restricted my observations to an attempt to answer three questions. First, is the performance technically competent, with decent ensemble work and polished individual performances (the lack of which might indicate either less-than-first-rank musicians or cost-cutting on the editing stage)? Second, is the performance likely to engage and maintain the interest of the average listener? And third, is it sonically convincing?

With one possible exception, I can report that all of the recordings I sampled exceeded my minimum criteria with room to spare. The only really disappointing effort is the Wagner. Two orchestras are represented on that disc: the Sophia Radio Symphony is the less effective. Its performances of the Götterdammerung and Meistersinger excerpts seem tentative, its ensemble work a bit ragged. The Budapest Symphony, on the remainder of the selections, is a definite step up, but this remains, to my mind, the least desirable of the five discs. The best? Clearly the Vivaldi, where the Budapest Strings and Neues Bachisches Collegium Musicum are technically superb, their performances spirited and thoroughly enjoyable. The Mendelssohn comes in a close second—the musicians of the Philharmonia Orchestra London (one of the better-known orchestras represented on these discs) attack the "Italian" symphony with relish. In the accompanying A Midsummer Night's Dream, the Budapest Philharmonic is no less capable. Famous Marches and Dances contains spirited performances (also by the Budapest Philharmonic) of the familiar—will I ever be able to listen to "Dance of the Hours" without visualizing tutued elephants?—and the less familiar (the delightful "Pas de soldats" from Rossini's William Tell). And Bolero (played here by the Hungarian National Philharmonic Orchestra) is, well, Bolero—except for the concluding bars, where conductor Adam Fischer makes an alteration which I won't spoil by giving away. I enjoyed all of the performances on these discs, except as noted on the Wagner, and feel that I definitely got my money's worth—something I can't say about a not-insignificant number of $15 CDs.

As I write this, I'm still in the process of getting my primary system set up; all of my auditioning of these recordings was therefore done through Stax Lambda Pro headphones. These are excellent phones for critical listening, but, like all headphones, do distort the soundstage and perspective of recordings intended to be heard over loudspeakers. With that in mind, I'll restrict my comments on imaging and depth to the observation that none of the recordings appeared to follow purist microphone techniques—but the multimiking and spotlighting here only occasionally detracted from my listening enjoyment. The overall balance of the recordings tended to the bright and slightly cool and lean, but the same may be said of the Staxes. Occasional digital artifacts were
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present in the form of a slightly furry quality at low levels, especially on strings, and occasional congestion on brass. But I didn't anticipate the best Telarc/London/EMI sound quality, so I wasn't disappointed when I didn't get it. What I did get was sound which was dramatically superior to that which I had anticipated at the price. And sound which never interfered with my enjoyment of the music.

If these recordings sold for $10 or even $8, competing with the established artists and (sometimes) better sonics of the major labels' bargain CDs, they would probably attract little interest. But at well under $4,² they fill an important void. I consider their single most important contribution to be the likelihood that they might attract the attention of the non-classical music lover who decides to experiment, wouldn't dream of risking $15 on a single, full-priced classical CD, but might buy three or four of these. They'll also make terrific gifts for such an individual. But they need to be displayed where the pop music fan is likely to see them, not buried back in a corner of the classical section.

It's also no secret that the major record companies are making out like bandits in their profit margins on full-priced compact discs. No wonder the LP is fast disappearing—the per-unit profit potential just can't compete. Anything which puts downward price pressure on the majors is, in my judgment, a plus. The Laserlights appear to be well-equipped for just such a frontal assault. Even if (as I suspect) they turn out to be of something less than demonstration sonic quality when heard over good loudspeakers, I won't regret the investment. I have already received significant musical enjoyment for a small outlay. Isn't that supposed to be the bottom line?

Addendum

After submitting this report, I received a copy of the current Laserlight catalog. There is a slightly broader selection of symphonies and concertos than I have implied above, including a number of boxed sets. A complete boxed set of the Beethoven symphonies, for example, is available on five CDs ($17.20 at Tower). I would still not refer to the Laserlight catalog as esoteric or even adventurous, but it does provide a broad selection of works from the standard classical repertoire—nearly 100 discs. There is also a selection of classic jazz recordings and something called the International Passport series. All of the recordings are also available on cassette.

² The manufacturer's suggested retail is actually $4.95, but they appear to be widely discounted.
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ManufaCturers' Comments

PSB Stratus loudspeaker
Editor:
Whoops... Because your “Recommended Components” issue plays such an important role in the industry, we are concerned about an oversight in the October issue’s feature which reports that the PSB Stratus has been deleted from Stereophile’s recommended list, and that this model has been replaced in the PSB line by the Stratus Gold.

I don’t know how this misunderstanding happened, but the Stratus is still very much a part of the PSB line. The Stratus Gold was introduced at last June’s CES as the new top-of-the-line; at the same time, we also introduced an improved version of the original Stratus—at no increase in price.

“Recommended Component”-type listings are always tricky, and I suspect that there might be an addendum published in the near future. As the Stratus is the mainstay of our line, and probably the PSB product that American consumers and dealers are most familiar with, we trust that Stereophile will set the record straight.

Gordon A. Simmonds
President, PSB Speakers

I apologize to PSB for my misunderstanding concerning the Stratus’s deletion and confirm that it will be reinstated in “Recommended Components.”
—JA

Icon Parsec loudspeaker
Editor:
All of us at Icon would like to thank everyone at Stereophile, and in particular John Atkinson, for his great review of our Parsec loudspeaker. We are extremely gratified that John found the performance of the Parsec to excel in so many areas, and to ultimately represent an “excellent value.”

We were most impressed with the depth and rigor of John’s investigation, and applaud his heroic analysis of the Parsec cabinet. And we are, of course, very pleased that John (and Tom) found the high-spirited nature of the Parsec cabinet to have only a minor effect, in very specific instances, upon their enjoyment of the music.

Speaking personally, I was especially glad to see John note that “without a dealer’s margin to be allowed for in the price, Dave Fokos has apparently passed on all the savings to his customers.” When I founded Icon, it was my desire to make high-quality sound more accessible to audiophiles of modest means. It has been my experience that audiophiles who have to work long and hard to purchase new equipment are often those with the greatest appreciation for the rewards of high-end audio. John was quite correct in quoting my vision of a future where “all manufacturers sell their products directly to the end user” so that “even the audiophiles in Dead Horse, Alaska can have access to all that the audio community has to offer.” However, I feel it is important to include the second half of my vision, in which today’s audio dealers would evolve into service-oriented businesses such as custom installers and paid audio consultants. In this way, not only would audiophiles have access to products from all manufacturers, they would also have available to them the full range of services currently offered by audio dealers, the only difference being the elimination of the temptation to offer advice biased by sales commissions or the products stocked in.

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the back room.

Finally, we invite Stereoophile readers to audition a pair of Parsecs (or Lumens) for themselves. As John concluded, "You have nothing to lose considering the manufacturer's 30-day, money-back guarantee, and everything to gain in the way of hearing your music played with plenty of meat on its bones."

Thanks again. "Cool" Dave Fokos President, Icon Acoustics

Bitwise Musik System One
Editor:
We would like to thank Dick Olsher for his thorough, insightful, and valuable review. As design philosophy, we apply strict engineering principles in conjunction with critical listening tests. Dick's careful evaluation of the Musik System One has given us new insight and perspective for future improvements.

We are very proud that Dick finds the Musik System One to possess an "analog-like liquidity." Our design reference has been live music and the best analog playback systems. Therefore, our hope is to bring digital playback to that reference level.

Realizing the sensitivity to digital cables, we are shipping the Musik System One with the AudioQuest Video Z interconnect. Our objective is to minimize or completely eliminate the cable dependency in the future. Again, our sincerest thanks to Dick Olsher and Stereoophile for your kind words and balanced assessment of the Musik System One digital audio processor.

Sean Yang
President, Bitwise Audio Technologies

VTL Reference D/A converter
Editor:
We feel truly honored by Robert Harley's favorable findings in his perceptive and authoritative review of our VTL Digital-to-Analogue Converter; especially so because this is our first plunge into leading-edge digital engineering...and against some formidable competition.

Harley makes two (accurate, of course) constructive criticisms: first, concerning the need for some "muting" arrangement, and second, the error in the 'de-emphasis' EQ. In the case of the 'mute,' we too had arrived at a similar conclusion shortly after the Stereoophile review unit was delivered, and fitted a manual 'mo-

mentary-action' shunt-switch to all units shipped to customers. (Bob Harley has it right in his comments as to my personal abhorrence to running signals over auto-mute relay contacts!)

In the case of the fairly small, but important, inaccuracy in the de-emphasis mode, we owe Harley (and therefore Stereoophile) our grateful thanks for drawing this to our attention. It was a combination of tiny deviations in two resistor/capacitor values (1k74 calculated, 1k82 actual; 10n6 calculated, 10n22 actual). Very fortunately, the Stereoophile review preprint arrived sufficiently early for us to correct this (by additive trim-values) in all shipped-out units.

By the time this issue hits the streets, our Manley Analogue-to-Digital Converter should be available (of course, with a sample also in Harley's competent hands). This will complement our D/A's value in the leading mastering-rooms we deal with. The D/A's primary use is in the monitoring loop of the ubiquitous industry-standard Sony 1630 final-master recorder (thus allowing the engineer to more exactly know what the CD master he is preparing will sound like on the eventual CDs purchased by your readers), and also in the playback loop of the playback 1630 driving the final master 1630 in the editing/assembly process. Similarly, our 20-bit Analogue-to-Digital Converter will be employed in the mastering process, where the master tape is actually a 30ips (or 15ips) analog tape—still a very popular (thanks be) format favored in Hollywood and New York studios. We mention these latter points in the reader's interest in knowing that our converters will make their inherent high-quality impact on the actual (and critical) path of bringing publicly released CDs up to a better high-end standard.

We sincerely thank you and Robert Harley for a conscientiously executed review.

David Manley Vacuum Tube Logic

Esoteric P-2 CD transport
Editor:
Thank you once again for the opportunity to have our P-2 CD transport auditioned and reviewed by Stereoophile. What more can you ask for than to have your CD transport called a "landmark product"? Perhaps that: "The Esoteric P-2 is innovative in design and extraordinary in execution...a technical tour de force."

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Although the VRDS mechanism reduces tracking-servo activity as far as it is physically possible, it cannot be eliminated entirely due to random disc defects, and the need to advance the laser pickup assembly and adjust the rotational speed of the disc as it is played. The CN servo system is designed to protect against residual interference from this source of radiation. It essentially uses a low-pass filter to eliminate any potentially destabilizing elements from the servo signal, and helps to minimize vibrations in the optical assembly. No doubt the components we selected in electronics and chassis construction as well as the overall circuit topology also play a major role in what Bob heard during his audition of the P-2.

The disagreement among audiophiles as to whether the transport or the D/A converter plays the most significant role in the accurate reproduction of compact discs is an interesting one. Bob states that he strongly disagrees with the contention that the transport has as much or more influence on the reproduced sound than the D/A converter, and that the overall system performance is much more dependent on the converter.

Although I agree with his contention that a $1000 transport with a $4000 converter makes more sense than a $4000 transport with $1000 converter, I have found through my own personal listening experiences, at home and in many of the demonstration rooms and homes of our Esoteric dealers, that differences in sound among CD transports (including our own) are much more concrete and obvious than are the differences between high-quality D/As, where I find differences to be much more subtle and subjective (much like comparing fine loudspeakers or phono cartridges). Bob and Stereophile will have an opportunity to test the validity of my own experience soon when they audition the P-10 and P-500 transports and have an opportunity to compare them to the P-2. I look forward to their opinions.

The key question in most audiophiles' minds (and the one I get asked most frequently) will likely be, "How much improvement do I get sonically in going from my CD player's digital output to a $1000 transport to a $2000 transport to a $4000 transport? What's the difference in sound?" My recommendation is to go and do some serious listening and let your ears be your guide. You will hear the differences; then you will have to evaluate the cost/performance ratio as it applies to your own system.

As to why we continue to hear differences in digital products that have no basis in empirical measurements, you will get as many different opinions as people that you ask. There is still so much about digital audio that we are still learning that I can only be thankful that we can hear these differences as we develop new technologies and new products so that we as an industry can continue to push the edge of the digital envelope and produce and develop the best-sounding products that we can.

Mitchell R. Witten
Sales and Marketing Manager
Esoteric, a division of Teac America, Inc.

The Listening Room computer program
Editor:

Sitting Duck Software appreciates Tom Norton's careful and comprehensive review of The Listening Room computer program. As Tom states, software is seldom finalized because it is so easily modified. This proves to be a real consumer advantage because user suggestions can be rapidly incorporated into the product for the benefit of both past and future purchasers. Because of this, we solicit user comments/suggestions and are happy to add features which will make the process of speaker/listener placement less tedious.

Unfortunately, as suggested in the review, there are few dealers using the software for the benefit of their customers and, currently, zero dealers selling the product. Indeed, our mailings to alleged mid- and high-end dealers, half of which advertise in Stereophile, were met (apparently) with a resounding yawn. So, too, were our efforts in advising the major mid- to high-end speaker manufacturers of how they could benefit, in the long run, by recommending the program to those who purchase their product. Why we encountered this lack of
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interest continues to elude us, particularly since almost everyone has, one way or another, access to the requisite computer.

On the plus side, interest is picking up, thanks to the reactions of those who are aware of how critical a part the room plays in the satisfactory reproduction of recorded music. Where a great deal of experience might give one the ability to properly locate the listener and speakers in a given room, I can't believe that intuition could play a part. In fact, although many to whom I have talked remember from their physics classes what standing waves are, most are surprised to learn that standing waves can form in their very own living rooms and affect the sound systems. Feedback from users of the program invariably contains a form of the phrase, "The program recommended placements in areas other than what my intuition would have suggested." If one can intuit speaker placement, factors such as "my wife will kill me if I put the speakers there" probably play a dominant role.

I agree with Tom in that an anechoically flat low-frequency system is, in most cases, not the best choice. My own woofer installation, which has had its positioning decided upon by "The Listening Room," has a Qts of 0.5 and the low-frequency level is more than adequate, given the reinforcement provided by the room and the fact that I can add a touch of boost if I feel it's needed. I will have to admit that, at first, I missed the artificial low-frequency enhancement that some standing-wave modes were providing, but as time passed I became increasingly aware of the gain in bass "quality." The tradeoff was more than equitable, and although older recordings seem a tad thin, the newest or remastered releases appear to be "on the money." All things considered, it may come to pass that Qts values of 0.5 and proper positioning will become the standard of the mid- to high-end segment of the industry.

Bill Fitzpatrick
Programmer, Sitting Duck Software

That your conclusion was that the Studio 10s "join that select group of minimonitors with which I could happily spend the next 10 years listening to music" is praise indeed.

"Single Flow Reflex" simply means that the speaker is tuned by a single port (several designs use two or more ports). It is the case that turbulence can be detected in the port (this cannot be totally eliminated), although, as you note, efforts have been made to minimize it. By placing the port at the rear of the speaker, this effect is completely masked under normal listening conditions. Perhaps the tradeoff is that positioning of the speakers "correctly" in a room is slightly more time-consuming, but the results, as your review eloquently states, are well worth it.

Robert Sinclair
Director of Sales & Marketing
Kevro International, Inc.

NoiseTrapper vs Tice
Editor:
In response to George Tice's comments on the Stereophile reprint policy in the October issue (p.293) and, more particularly, his feelings about the NoiseTrapper product and its marketing:

Your reprint policy seems straightforward to me. It appears that Mr. Tice feels that any Stereophile review is then proprietary to the manufacturer, rather than published information available to us. Of course, the magazine has the right to control and distribute the information of its contributors.

Likewise, I do not agree that Mr. Tice has a proprietary right to the category of line conditioners, regardless of merit, date of product introduction, or anything else. (I suspect the notion of power-line filtering predates stereo reproduction.) In a free market system, different products compete.

As to the complaint that a generic phrase like "specifically designed for audio" is used in two pieces of literature: 1) I am not surprised, and 2) we had no knowledge of Tice's prior use (not, in fact, would we have cared, because we regard the phrase as generic). In fact, the NoiseTrapper is specifically designed for audio use.

Contrary to Mr. Tice's recollection of our telephone conversation, I told him that our transformer had been custom-designed for us, for use in this particular product. I did not then, nor do I now, see any point in having Mr. Tice call our designer to find out exactly what was
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done to give it the performance it has. Would Mr. Tice tell us the exact design of his transformer? I doubt it.

Besides, we say that the NoiseTrapper as a whole is specifically designed for audio use, not just the transformer. Perhaps Mr. Tice does not realize that the NoiseTrapper uses both a transformer and a 10-element EMI-RFI filter network. We found that the transformer and filter network in combination yielded a better sonic result than a transformer alone.

On a brighter note, the NoiseTrapper is now available through many retail stores—instead of Audio Express only. The discerning reader will note that the price (now $299) went up before the "Recommended Components" issue—so please, no comments on how recognition raised the price! Even at the new price, we think the NoiseTrapper is still the best value available.

Mark Lyon
Audio Express

Wadia 2000
Editor:
We have just received our copy of the October issue of Stereophile; and appreciate that the Wadia 2000 was given the highest sonic rating in the "Recommended Components" section. Certain factual errors are confusing our customers and many of our dealers have called us, asking for clarification.

Burr-Brown DAC chips: All Wadia processors currently use our own DAC components. At this time, they are made to our specs by Analog Devices, and one other qualified vendor. This may change from time to time. We do not know the source of Stereophile's information.

We do not use Stan Curtis's Cambridge CD-1 DAC design. This is evidenced by the patent office's recent action in determining novelty over all prior art. Stan Curtis was (is) brilliant. In our view, he was very close to the ultimate time-domain and transient performance in DAC design. The improvements we made over his original method will not be disclosed until our patent issues. Repeated attempts at reverse-engineering have failed to discover the transversal formula that is key to our success.

64x "Controversy": From a more "objective" perspective, we fail to understand why you would, for the third time, make reference to what has become a non-issue among those who are technically knowledgeable. Dick Powers of Ultra Analog, for example, has confirmed the fact that Wadia's multiple DAC method legitimately produces 64x oversampling.

The so-called oversampling controversy is only a controversy in the minds of our competitors. Our response has been published in a Wadia Technical Bulletin titled "Smart DACs" (enclosed), and is also available to others on request.

Poor Low-Level Linearity?? We are also surprised that Stereophile would say our low-level linearity is poor when the error is less than one CD LSB and is traded off against ½ LSB of dithering. The low-level linearity of all our products is very good even according to your own tests, which indicate less than a 5µV deviation, where the smallest unit of change your test computer can produce is 15µV (ref 0dBV). Most recording engineers we know recommended dithering after the DSP process, and we are the only ones who actually do it.

Our view on oversampling, and a discussion of Wadia low-level linearity, are both covered in the enclosed pre-print authored by Abel Graham, who writes for the Application Specific Computer Industry. Wadia will make copies available to interested Stereophile readers.

Finally, your test computer needs a checkup. The latest published graphs of our squarewave response had the Gibb's overshoot on each end at different levels. The only way this could happen is phase distortion in the test equipment.

Don Moses
Wadia Digital Corporation

As explained in September (p.211), we had inadvertently measured the Wadia squarewave response with an anti-aliasing filter in circuit in front of the storage 'scope. This filter added spurious leading-edge ringing to the waveform. Our apologies to Wadia. —JA

Manley and Modjeski
Editor:
The overriding tone of Roger Modjeski's tasteless letter (September 1990, Vol.13 No.9) was, first, insufferably arrogant in the insults he directed at me, the "confused and emotionally anguished" designer; second, facetious (and unsound) toward tube-swapping; and third, selfservingly irresponsible in its quasi-factual content pertaining to the industry of tube manufacture, availability, voltage ratings, and quality control.

Since the gloves are off, I will spell out some
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frank stuff I was reluctant to raise in our previous letter (Vol. 13 No. 2, p. 215), which sought mainly to underline the importance of following a given manufacturer's recommendations. Roger advocates output-tube swap-over experiments in his amplifier, thereby offering, he notes, nine sonic variations. Quite the opposite, I would have thought, of today's educated high-end system thinking... so be it. We unequivocally do not condone this practice in our equipment, preferring rather the concept of a totally designed entity; the overall circuit, input and driver sections, power supplies, with output tube and transformer interface being consummately balanced and optimized within a given model; we elect to present a well-ordered, flat-calibrated, non-experimental finished piece.

While addressing modifications (because we so view tube switching in our equipment), let me tell you that unhampered-by-knowledge "tube rolling" carries on apace: our brand (like Stereophile) is distributed worldwide and we have seen, under the catchall of "upgrading," output tubes being replaced with: 6L6s: workable in a pinch but only 0.9A drawn on heaters (a little more than half of EL34 heater current); 6146s: totally wrong, inadequate screen-voltage handling; 7027As: different pinout/internal link causing catastrophic failure. Also input tubes: 12-anythings being swapped willy-nilly, and 6201s being replaced by 6922s! (This last by a dealer (no longer) who "heard that selected 6922s sounded better... ") And it doesn't end with tubes; it goes on to include binding posts, input jacks, internal wiring, capacitors, resistors, and tube sockets. Now that Roger has explained that the output transformer need only loosely match, it seems the (chrome) chassis is the only component safe from "improvement." (But don't bet on it; probably some aftermarket axe-grinder is sweating in his basement right now on a Kryptonite chassis.) Most of these things are promoted and sold under the smiling banner of "the designer/manufacturer doesn't know what he is doing and/or is too cheap to fit my parts in the first place."

And here is where I take most serious issue with Roger's letter, for it concerns his subtle "after-marketing" that would have you believe, inter alia: the wasting tube industry is in a shambles... pathetic quality control... not making 'em like they used to... no modern output tube can handle more than 475V DC on its screen... never found a reliable Russian output tube... the designers/manufacturers are confused and laboring under misapprehensions and hence (by implication) RAM is the fountain of (remaining) good tubes and knowledge... etc. Not true, not even slightly true, and I'm not holding still for this negative propaganda. It is precisely this type of generalizing and mumbo jumbo spread by tube merchants that pushes up tube prices, helps keep consumers in the dark, causes them worry, and feeds the "antediluvian" notion some folks hold of tube technology.

Sadly, it is not only "negative propaganda" and quasi-factual information that some tube merchants disseminate—sometimes downright falsehoods are knowingly uttered, such as: A) the overprinting of "KT88" we have seen on GE 6550As by a large corporation that really ought to know better; B) a "select-and-brand" tube house's (not RAM) head man offering me Chinese KT88s which he willfully lied about as being from "a tube manufacturing plant we own in Canada" (!); and C) statements like "Actually we have purchased a financial interest in the Yugoslavian tube factory." This last statement is totally untrue and totally impossible since this particular factory is very much government-owned and not even the senior directors are able to buy shares. Why oh why cannot tubes be marketed with the simple correct facts?

Roger's main business, RAM Tube Works, is primarily that of vending tested, selected, and re-branded vacuum tubes of varied provenance. Tube "set-matching" is another RAM service; again comes the implication that "smart audiophiles" should opt for "matched" output sets. We note that the RM 9 has only one bias adjust control, making "matching" almost mandatory... and with the three "sonic options" of EL34, 6550, and "KT88," why, you need not just a matched "quartet" or "octet," but a whole damn "big band" of matched output sets. (My biggest problem with single bias controls and tube-matching is that my comprehensive range of test equipment does not include a crystal ball to predict and control that all the matched tubes age identically (and how does one go about replacing just a single failed tube?).

Tubes from this type of service are expensive (I did not say "unjustified" or "extortionate"; x hours of genuine work are put in, and
noteworthy are the volumes of RM 9 amplifiers produced (ca 250 pieces in four years, as stated in Roger's response to DO's Stereophile review), and also the number of tubes processed/handled by RAM (30,000 to 40,000 pieces in 12 years, as stated by Roger in the letter now under reply). May I please state that VTL builds and ships worldwide about 250 pieces of tube electronics every month! We use about 30,000 tubes in our manufacturing process every year, and sell a further 8000 or so annually to overseas distributors, dealers, and private hobbyists. Trust me, please; I do not reveal these numbers in a power-race spirit. The quantities reveal that we unquestionably need to deal directly with manufacturers as distinct from tube merchants or test/select/re-brand services. These quantities further tell that we continually know the true world tube manufacture-and-supply position and have to do so to responsibly plan for the future.

Exceptionally, we do business with the mighty Richardson Organization of La Fox, Illinois, which is both merchant and manufacturer: they'll be the last and only American manufacturer left when MPD/General Electric shuts down production of conventional tubes 10-12 months hence. Richardson's sells $160 million annually (in tubes! though audio or "receiving" tubes probably account for only 15% of that), and they've planned to expand their specialist manufacturing arm upon GE's cessation. Verily, they have a great deal of money invested in the industry of vacuum tubes.

But we do not only deal with Richardson; we deal firsthand with the expert people at the EI (Elektronska Industrija) factory in Yugoslavia, who have an annual production capacity of nine million tubes. We deal also with the premium Russian factories who, like EI, have supplied us with data of the most up-to-date technical specifications such as has not been published since RCA, Tungsol, and Sylvania in their primes. And through their properly authorized factory representative, we buy certain types (mainly 12AX7A and 807s) from the Shugang/Beijing (multi) factories.

So the fact is that while the number of sources is decreasing, the quantity, constancy of supply, and dedication to quality are increasing. Actually, the closure of majors like ECG/Sylvania, Mullard-Osram UK, and soon General Electric, are inextricably interlinked: it was/is the pres-

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sure of price combined with the quality of tubes being manufactured by the likes of China, Russia, and Yugoslavia, and the inroads these giants have made in world tube marketing, that contributed to the squeeze felt by tube manufacturers with high costs of wages and other (may I say “Western”) overheads. Tungsram of Hungary was another recent casualty.

Though it may well be that the tubes passing through Roger’s hands cannot handle more than 475V safely on the screen, it is categorically not so with the tubes we use and specify. We demand and get tubes that meet “book-spec,” such as the currently built GE 6CA7/EL34 and 6550A; moreover, the EL34 we get from Yugoslavia exceeds book-spect. Our newly arrived KT90, the result of almost a year’s planning and codevelopment with repeated laboratory visits to Yugoslavia, exceeds both 6550A and original British KT88 specs with a plate dissipation of 46W; our KT90 easily handles up to 850V on the plate and 650V on the screen-grid; it is truly a breakthrough in modern audio-tube technology.

I have to report that we have so far used over 10,000 pieces of a specific Russian factory’s build of a near bulletproof 5881/KT66 derivative, and about half that number again of 807s from another Russian factory specializing in transmitting tubes. We have proved not only an insignificant (less than 0.5%) failure rate, but also useful life in the +10,000-hours league and, very importantly, sample-to-sample consistency that borders on amazing. In the case of the 807 type, and with reference to Roger’s “ain’t making ‘em like they used to,” we carefully compared the current Russian build to the best samples of brand-new-in-box RCA “JAN” types (Joint Army Navy, and they supposedly don’t come better than that). The results were overwhelmingly in the Russian 807s’ favor in every parameter.

Let’s hear it now, for (and against) China. Please be under no illusions: the Shugang/Beijing factories know how to make excellent tubes, as shown by their almost universally used 12AX7A and our continuing experience with their 807s. But, and this is a big but, they do (sensibly, for their balance-sheet) build to a price-point . . . you get what you pay for. A prime example of this is the Chinese KT88 iteration. We have tested a batch of these faithfully every 12 months or so to monitor their progress, and have found them unsatisfactory even

Stereophile, December 1990
when used 200V under "book-spec." We believe that Shugang is capable of building an audiophile book-spec KT88 that would have to retail in the $50–$60 area, but for now they prefer to build for a larger and less demanding customer base. (This information is from the lips, first-hand, of their properly authorized factory representative.) What I'm talking about here is what are correctly called "average commercial grade," built for economy, somewhat de-rated from full spec, and priced accordingly. The Hungarian/Tungsram "slimline" EL34 was/is just such a tube; it was sold extensively to Telefunken and Siemens (and brand-marked so), and in lightweight duty was not a "bad" tube per se. Used in a Dynaco or Mullard "5–20" amplifier with 400–425V, it would run just fine. The same applies to its use in less powerful guitar amplifiers, where it was extensively supplied in a "selected" replacement variety by the test/select/re-brand corporation which specializes in the supply of tubes to the musical instrument industry. We continually refused to buy these because we proved that they cannot function at or even near published EL34 design spec. Curiously, their own true spec and design-center maxima were never published by their manufacturer either, which is mainly the way it goes with lesser-priced commercial grades.

Re. Special Test Requirement: I am sorry to note that Roger, "...as far as he knows...," feels this to be a "soubriquet," or marketing gimmick; the initials STR followed by a number tell a tube (or other precision component) manufacturer that a specific list of exacting technical tests must be performed to meet or exceed the customer's ordered criteria or they cannot be shipped. (Interestingly, the ones that do not meet the original customer's spec are still sold, often at a lower price, to bulk distributors, and then go on their merry way to those who retest, select, and re-brand them.) Any interested reader who would like a copy of the full spec of our KT90 and its Special Test Requirement is welcome to write; we'll mail one with pleasure.

In closing, I want it known that it is not in any way within Roger's province to (superciliously) "dash David's hopes" I ply my trade with surefooted engineering training and 30-odd years of dedicated tube experience. It is actually those folks panning for gold (and gem-like tubes) that rely on hope. David Manley Vacuum Tube Logic

SimplyPhysics Isodrive CD clamping system

Editor:
Peter Mitchell's tantalizing mystery with the Esoteric transport's superior handling of the CD disc over a stock Philips or a stock Philips with Mod Squad damper ("Industry Update," Vol.13 No.9, p.43) is no mystery to me. For over two years we have sold thousands of our Isodrive transport damping kits for Philips decks. The Isodrive is a full-disc clamping system that locks the CD and itself into the center of spin—the drive hub itself!

The Esoteric, in fact, is a blatant copy of our idea. And it is not as well executed! I would like to send you an Isodrive-modified Philips unit such as the CD80 to compare as a digital transport against any other!

Why do these full-CD-clamped transports work better? I feel it's the reduced servo correction for 1) speed, 2) focus, and 3) tracking (pen), and also the reduction in bitstream "jitter." Why didn't the Mod Squad damper improve jitter? Because it doesn't lock to the center of spin, it doesn't clamp the entire CD at the periphery first (flattening!), and it is stamped instead of precision-machined. Maybe that's why it's discontinued!

I'm glad to see you are now finding CD tweaks (full-disc clamping) that are the most effective!

Rick Roberts
SimplyPhysics

Digi-Clear

Editor:
We wish to thank Sam Tellig for saying Digi-Clear does appear to improve CD sound [in Vol. 13 No. 9].

As to the statement that lens paper is more likely to scratch polycarbonate than cotton balls, we must disagree. One has to go no further than the eyeglass industry to see the benefits of lens paper. It is used extensively in the optical field to clean polycarbonate lenses. A CD is, in part, a polycarbonate lens. Sam was right about the brush. The product he received was a pre-production sample. We now include a 13mm plug in the bottle to remove most of the Digi-Clear from the brush in order to make its application easier.

Priced at $19.99, one bottle of Digi-Clear will treat over 1000 discs. At 2¢ a disc, we feel that's a good value.

William Hobson
Liquid Audio Products

Stereophile, December 1990
Editor:
We have just made a major breakthrough in the application of Finyl. The product is even better than we had realized.

Finyl improves the sounds of CDs because it lets more light get into the disc, thereby minimizing spurious and unwanted reflections from the polycarbonate surface. Treating the surface with Finyl improves clarity and reduces harshness. We now realize that Finyl can do much more to improve CD sound.

There is another phenomenon happening with CDs that has been addressed by edge and center-hole treatment with magic markers or paint. Once the light gets into the CD it bounces around horizontally inside the disc by reflecting off the edge and center-hole boundaries, much as if these boundaries were mirrors. Some of this reflected light is bounced in such a way that it affects the photodiode. The magic-marker or paint approach improves the sound by absorbing much of this light at the boundary, thereby reducing reflection. Most keen listeners have recognized the validity of this approach. We compared Finyl to existing edge-treatment products and discovered that by applying Finyl to the edge and center hole, the effect is greater than using a magic marker or paint.

Because of Finyl’s Optical Impedance Matching property, it prevents the boundaries of the disc from acting like a mirror and allows the light to pass out of the disc. The effect of treating the outer edge and inside hole with Finyl is even greater than just treating the surface.

To treat the outside edge, spray some Finyl on the buffer and rub it around the edge. To treat the inside edge, spray Finyl on a cotton ball or soft cloth and apply. We are working on finding the best way to make all three applications, and will keep you advised.

A good demonstration for customers, and certainly a good way for reviewers to proceed, is to first apply Finyl to the outside edge only and listen. Next, apply Finyl to the inside edge and listen again. Finally, apply Finyl to the surface for a third listening. Each of the treatments adds a new improvement to the sound. Or, you can go from an untreated disc to a three-way Finylized disc for maximum impact in an AB demo.

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Stereophile, December 1990

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Amplifier differences and anecdotal evidence

Stereophile's pages have lately been filled with the conflict between the Stereophile philosophy of equipment evaluation (as eloquently expressed by RH and JA) and what is colloquially referred to as the AES philosophy.

My first direct contact with this latter point of view came in 1984 on a Technics-sponsored press "junket" to Japan. In addition to enjoying their fabulous hospitality, I spent extended time with members of the establishment audio press, including one of High Fidelity's shining lights, who was adamant that there were no audible differences between electronics. At this time, I was a mere schmere in the audio business. I had become Publisher of Stereophile in March 1982, and had barely been exposed to the commercial world's harsh realities. Of course there were important differences between electronics, I pronounced. Hadn't I already published tens of reviews by J. Gordon Holt analyzing just those differences? Hadn't I heard those differences myself time and time again? Weren't new, and audibly better, amplifiers appearing every month? I assumed the right honorable Editor from High Fidelity was joking—or sadly misinformed. Far be it from me to associate High Fidelity's demise with the nonviability of this point of view, though some of you, I'm sure, might draw that conclusion.

The opposition (to audible differences) is scarcely monolithic. Stereo Review has published comparisons between a Pioneer receiver and a Futterman output-transformerless amplifier costing $10,000 which revealed no differences. David Clark, writing in Audio along with Stereophile's own Larry Greenhill, has on more than one occasion established that an amplifier highly touted by Larry (in the same review, no less) was audibly indistinguishable from his "reference." These folks can fairly be said to be in the "all amplifiers sound the same" school.

Stanley Lipshitz, of the University of Waterloo and the AES, takes great pains to distinguish himself from this band of non-discriminators (Vol.13 No.11, p.4): he would never say such a thing! He feels that amplifiers are audibly indistinguishable if all linear errors (frequency response, phase shift, polarity) are made equal, and all non-linear errors (presumably this means all forms of distortion) are kept to trivial levels. But this is a truism! All he's saying is that there are no mystical differences between amplifiers: if there are differences, they are either linear or non-linear. However, he then goes on to say that any competently designed modern amplifier achieves this goal of trivial defect, and that, therefore, they will all sound the same (as long as they're not one of those "audiophile" amplifiers, into which distortions have been purposely built so as to distinguish them both from accurate amplifiers and from other amplifiers with different audiophile inaccuracies). You can see how he could be lumped into the "all amplifiers sound the same" school.

Bob Harley goes back on the attack in "Proving the Existence of Fish" in this month's "As We See It," citing the bombshell dropped by Roger Lagadec of Sony at last month's AES convention. I am incompetent to evaluate M. Lagadec's thesis—I can only give it some credence based on his impressive credentials and on Dr. Lipshitz's inability, initially at least, to counter the thesis presented at the AES. The extraordinarily interesting point is, however, Lagadec's apparent willingness to accept the evidence of careful listeners from both the professional and consumer worlds, without scientifically valid listening tests (blind or double-blind). Basically, he's saying, "Many, many people raise objections to various aspects of digital audio, and their objections are so often in particular areas: low-level detail, ambience, spatial presentation. Maybe they're right."

This is revolutionary! Did you ever consider how many products you buy, how many actions you perform, how many wines you drink, how many people you choose to befriend based on blind evaluations? The fact is that no one in the ordinary course of affairs ever uses blind evaluations; almost all information is anecdotal. Virtually all of Stereophile is anecdotal. I wonder if Roger Lagadec knows what a Pandora's Box he has opened in accepting anecdotal evidence. Maybe they—we and you—are right.
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*All diagrams are 1½ times actual size.
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First, we’d remove our heavy duty transformer and oversized heat sink. Of course, this means less current capability, resulting in compromised low impedance performance and compressed musical dynamics. Sonic anemia. Not to mention thermal overload.

Room to room remote capability would go. If we’re not concerned with performance, why bother with convenience.

As a finishing touch, face plates and chassis would be plastic instead of metal. So much for structural integrity.

Now, we could do all those things to an Onkyo receiver. But we won’t.

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