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MAY 1989

VOL. 12 NO. 5

## COMING ATTRACTIONS

On a recent trip to visit Philips' research laboratories and factories in the Netherlands, I was struck by the almost total lack of interest shown in the LP by other members of the US hi-fi press. With the exception of *IAR Hotline's* J. Peter Moncrieff, it would seem that the CD has all but won its battle against the venerable black disc as far as many of the movers and shakers of the magazine world are concerned. But as you can see from Larry Archibald's discussion on the joys of buying secondhand LPs on p.210, interest in analog playback still runs strong at *this* magazine, and our June issue sees the first installment of a high-end pickup cartridge survey performed by Arnie Balgalvis. He will be looking at three new moving-coils, the Dynavector XX-1, Krell KC-200, and Madrigal Carnegie 2, while the July issue will see him reporting on models from Spectral, Koetsu, Monster Cable, and the Jeff Rowland Design Group.

For those who *are* seduced by the little silver discs—as I am on odd-numbered days of the week—Lewis Lipnick returns with a review of the Special Edition of the California Audio Labs tubed Tempest player, while I will be listening to the Philips LHH1000 two-box unit.

### Announcement!

This most definitely counts as a Coming Attrac-

tion! I would like to take this opportunity to welcome our third full-time editorial staff person, Robert Harley, to the *Stereophile* ranks. Robert, who joins us this month as Technical Editor, has a solid background in audio engineering, including teaching Recording Engineering at California's Golden West College. He has also designed, built, and operated a professional recording studio. Robert has hi-fi retail experience, but his most recent position was being in charge of CD mastering at the Los Angeles-based Discronics corporation, where his responsibilities included assessing the quality of master tapes. His audiophile clients included Bainbridge and Reference Recordings—he worked on the latter's unique direct-to-CD recording, for example (full report next month). In recent months, Robert was in charge of Discronics' CD-ROM mastering program—he contributed two chapters to McGraw-Hill's recently published *CD-ROM Handbook*—but his real love is music, and he has been active in location recording, using purist microphone techniques: in March he presented a paper to the Hamburg AES Convention on the production of a CD from a master tape recorded and edited entirely in the DAT format. I look forward to the impact of the combination of musical, technical, and journalistic skills that Robert will bring to *Stereophile*. —JA

## STAFF

**Publisher** Larry Archibald  
**Founder and Chief Tester** J. Gordon Holt  
**Editor** John Atkinson

**Assistant & Music Editor** Richard Lehnert  
**Senior Contributing Editors**  
Thomas J. Norton Sam Tellig  
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**Contributing Editors (hardware)**  
Arnie Balgalvis Ken Kessler  
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**Musician in Residence** Lewis Lipnick  
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Christopher Breunig Barbara Jahn  
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Robert Deutsch Gary S. Krakow  
Gordon Emerson Robert Levine  
Mortimer H. Frank Richard Schneider  
Robert Hesson Bernard Soll

**Business Manager** Gail Anderson  
(505) 982-2366  
**Circulation Manager** Kathleen Rose  
(505) 982-2366

### Advertising Representatives

*East of the Mississippi & Foreign:*  
Neison & Associates (Ken Neison)  
(914) 476-3157  
FAX (914) 969-2746  
Yonkers, NY

*West of the Mississippi & National Dealer:*  
Neison & Associates (Laura J. Atkinson)  
(505) 988-3284  
Santa Fe, NM

**Production Manager** Rebecca Willard  
**Production** Andrew Main, Janice St. Marie

**Ad Copy Manager** Martha Payne

**Art Director** Michael Motley

**Cover Illustration** Michael Motley

**Support Staff** Allan Mandell, Danny Sandoval,  
Beverly Kler-Smith, Nancy Patrick

### Typesetting Copygraphics

© **Stereophile** — Vol. 12 No. 5, May 1989, Issue Number 112. *Stereophile* (ISSN #0585-2544) is published monthly, \$35 per year for US residents by **Stereophile**, 208 Delgado, Santa Fe, NM 87501. Second-class postage paid at Santa Fe, NM and at additional mailing offices. POSTMASTER: send address changes to **Stereophile**, PO Box 364, Mount Morris, IL 61054.

**Subscriptions** US residents (800) 435-0715, (800) 892-0753 (Illinois).  
Canada residents (815) 734-6309  
From outside US call (505) 982-2366. **FAX:** (505) 989-8791

# THE LAST WORD ON FIDELITY

J. Gordon Holt

Last October, in Vol. 11 No. 10, *Stereophile's* Founder and Chief Tester J. Gordon Holt stated, in his acerbic editorial "The Acoustical Standard," that, in his opinion, only recordings for which there is an original acoustic reference—ie, typically those of classical music—should be used to evaluate hi-fi components. And that in the absence of a consensus over such a policy, high-end component manufacturers were losing their way over what does and does not represent good sound quality. Many readers wrote to us agreeing with Gordon's thesis, although its uncompromising nature did surprise some, such as Mr. Ralph Gonzalez in this month's "Letters" section, whose musical tastes lean toward jazz or rock. It also came as a surprise to some members of the magazine's reviewing team, many of whom use all manner of recordings to assess components. As I pointed out in this space in March, the role of a reviewer is one of diagnosis, and any recording of any kind of music is valid to use, provided that it does enable him or her to reach valid value judgments concerning all the different aspects of reproduction. As Gordon started the whole controversy, however, I feel it only fitting that he should bring it to a (probably temporary) close.

—JA



Okay, so I overstated my case last October. But I offer no apologies for having done so, because a reasoned, sober presentation of a point of view never gets noticed. If you don't get people mad by overstating your case, they'll read it, say "That's interesting," and forget it. My intemperance in this made some readers (and *Stereophile's* editor) think about my point, whether or not they agreed with it, and that was its intent.

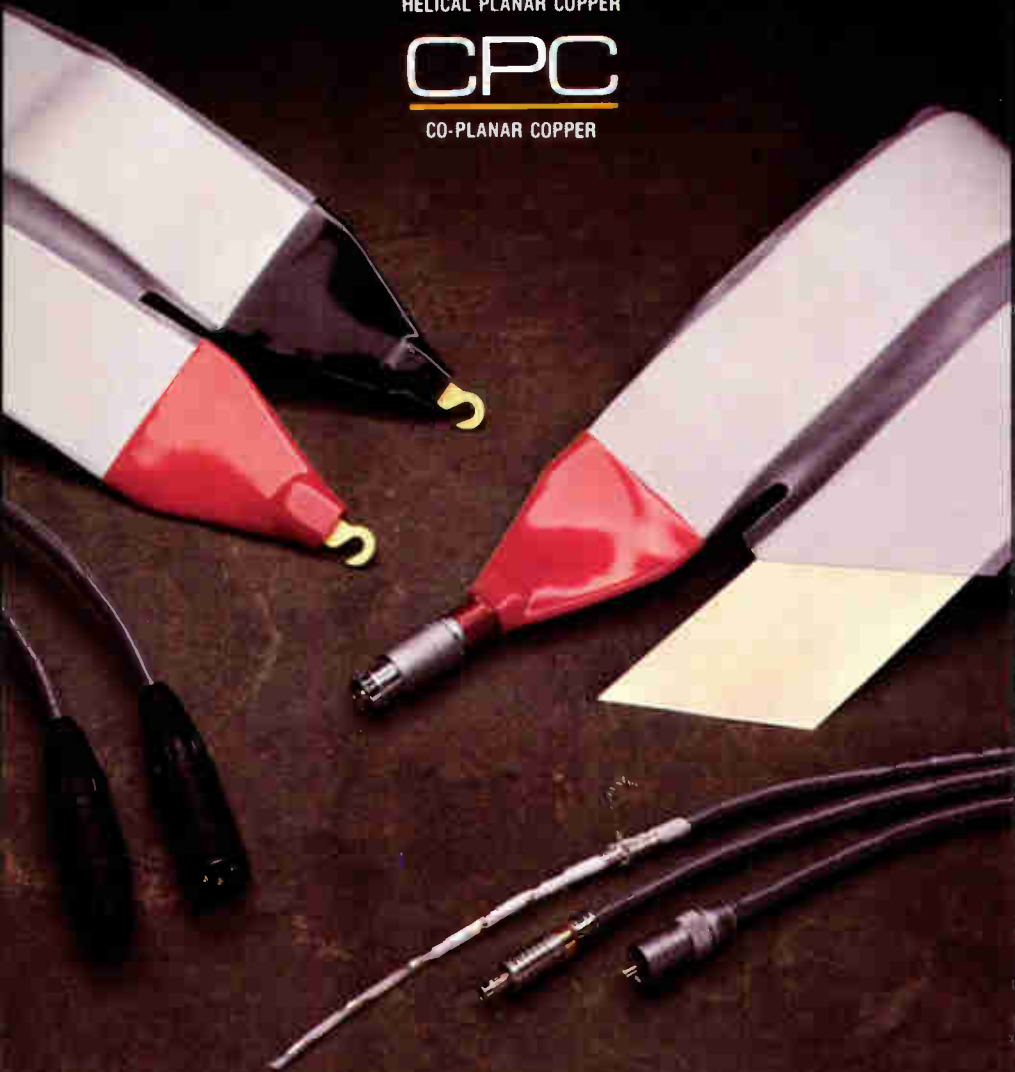
There is really no arguing with my view on this, because its truth is intrinsic in its own definition. But I will take the time to reiterate my line of reasoning here, for the benefit of those

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who need to have the obvious spelled out in neon.

1) Since fidelity in sound reproduction means accuracy of sound reproduction, there can be no fidelity without there first being an original with which we can compare the reproduction.

2) If that original is to serve as a reference for reproduction accuracy, it must be *completely* free from the kinds of electrical and mechanical artifacts which we know to be inherent in all of the sound-reproducing equipment whose performance we are trying to judge. That is, the original cannot of itself be the result of amplification and transduction.

3) The only musical sounds which meet the

requirement of #2 are those produced by acoustical instruments—those whose sounds are purely the result of mechanical vibrations.

4) Therefore, acoustically produced music is the *only* kind which can be used for the subjective assessment of the fidelity—accuracy—of reproduced sound. Period.

I am *not* arguing with JA's contention that electronically produced or processed music can be used for the assessment of *other* aspects of sound quality. It can, of course. But it should be obvious to any intelligent person that, by the very definition of fidelity, that kind of music cannot be used for assessing the *accuracy* of its reproduction.

I rest my case.

—JGH

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time of writing."\* And in Japan and Europe, the R1 has likewise driven the leading audiophile critics to unstinting admiration. But at a suggested retail price of \$8,000, it has been an experience reserved for the uncompromising few. Until now.

Now the Sony ES engineers have applied the invaluable lessons learned in the CDP-R1 to our other ES Series Compact Disc players. Which means now you can enjoy many of the benefits of an \$8,000 masterpiece without spending \$8,000.

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The accumulation of fractional errors in conventional digital filters can result in less than full 16-bit decoding accuracy. That's why the Sony CXD-1144 digital filter IC used in the CDP-R1 calculates to an unprecedented precision of 45 bits, while operating at an 8X oversampling frequency. And it's this advanced technology that has been incorporated in our new CDP-508ESD, 608ESD, and X7ESD players.

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recting errors long before they can affect the music.

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### A performance sustained.

With a heritage such as this, it's no wonder the new ES Series CD players and CD changers perform so much better than so many others. But then, it's a superiority we really shouldn't flaunt. After all, we did start with an unfair advantage.

The excellence of Sony's ES Series is also reflected in the three-year limited parts and labor warranty that backs every model (see your authorized Sony ES dealer for details). For more information on where you can audition the full line of Sony ES components, call 201-930-7156 (Monday-Friday, 9:00am-5:00pm EST).



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# LETTERS

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 letters are read and noted, only those of general interest are selected for publication.

## This man is correct

Editor:

When an audio system can reproduce all the ambience, rhythm, tempo, timbre, transients, dynamics, and stereo info of a recording correctly, it should be considered both accurate and musical. Period. Where, then, is the dichotomy between accuracy and musicality?

**Yip Mang Meng**  
Singapore

## This man is also correct

Editor:

Whenever I read a loudspeaker review in your fine magazine I can't help asking myself what happened to the remainder of the audio spectrum while you were praising the midrange, or highs, or soundstage of a particular system. Where did the rest of it go?

After all, live music—classical, rock, or whatever—usually consists of vocals, drums, strings, or woodwinds, etc. So shouldn't a speaker have to reproduce all of this to be considered good? If this is true, you would also have to rate them according to how well they reproduce all of the octaves. What I am saying is that they *must* pass the goosebump test to be good.

**Mike Sastra**  
Unadina, NY

## Is this man correct?

Editor:

Audio purists bristle at talk of inserting equalizers into the signal path, or the use of preamps with tone controls, preferring total accuracy in all cases, over any degree of tonal coloration. With respect to the controversy regarding this issue, I believe the criterion of listening enjoyment should be of overriding concern. I concede that the "straight-wire" approach is clearly preferable, *providing* your signal source is one of superb quality. Since many recordings fall considerably short of this mark, a poorly mastered CD, for example, will be accurately reproduced in all its glorious harshness by the straight-wire reference system. I for one, much prefer being able to compensate for program

deficiencies such as shrill or bass-shy recordings (albeit with the introduction of some coloration) through the judicious use of a tone control or equalizer; many of which can be switched out of the signal path when you've got a Telarc over the laser. The result, though technically less accurate, provides a much more "listenable" and enjoyable sound. . . and isn't that why we invest in our equipment in the first place?

**Art Velordi**  
Ridgewood, NJ

## Future shock

Editor:

Bill Sommerwerck's article "The Audio system of the Future" (January '89) was fascinating, but it suggested a slightly alternative version:

The time is five or six years from now. You've spent a day slaving over your home terminal and you decide it's time for some music. Accordingly, you call up a "high fidelity" processor on your secondhand NeXT and plop a CD into the disc drive—the soundtrack from the new Kubrick film *Memory Wire*. The program queries you for ambience synthesis and you select "Avery Fisher Hall," an environment you recently copied by modem from an audiophile bulletin board. The music begins; you relax into your listening chair.

Shortly, however, you sense that something isn't right. The music sounds distant and awash with echo; there's a curious buzzing—you glance at the terminal and discover that the ambience synthesizer has defaulted from "Avery Fisher" into "Airplane Hangar."

You attack the keyboard and correct the fault, but by now you're tired of the John Williams composition and decide on something less demanding, if possible. You settle on the new Doors reunion CD: all the surviving original members and the digitally synthesized voice and personality of Jim Morrison, now residing in a Cray supercomputer in the copyguarded archives of Warners/CBS/Sony/Philips. A dollop of peach brandy and back to the listening chair.

The music is everything you could want: Ray

Manzarek's wonderfully archaic keyboards, the loping rhythms, Morrison's voice. . . a trifle, well, *disembodied*, but sounding as sinister as ever. . . that *pocketa-pocketa* noise in the background. . .

What? But there it is, and worse, the music itself is fading; soon nothing remains but the monotonous plonking noise, which *can't* be right. Back to the keyboard, but nothing seems to help—the problem is buried deep in the microprocessor. In desperation, you flee to the kitchen and switch on a battery-operated tabletop radio.

The radio announcer informs you that a virus has infected music systems all over the continent, including, you now realize, yours. Insidiously, it interrupts all input at the D/A converter and substitutes a looped section from the 1959 recording *New Sounds in Stereo*: track four, "The Ping-Pong Game." Any affected systems must be thoroughly purged and vaccinated, which promises to be expensive.

The announcer then attempts to play a CD release of all-new Elvis recordings ("Is he alive or is he synthetic? You decide, folks!"), but all that emerges is a monotonous *pocketa-pocketa*.

You switch off the radio. In a cold sweat, you rummage about in a storage cupboard where the antique Linn Sondek is gathering dust. Primitive but virus-proof. Miraculously, it works when you plug it in. All you need is software.

You wonder what the Chesky brothers are doing these days.

Optimistically yours, **Robert C. Wilson**  
Toronto, Ontario

## Stop crying over vinyl

Editor:

I have a bone to pick with the anti-digital attitude most of *Stereophile's* writers and reviewers seem to have. I think we all know what direction the recording industry is taking. CBS has announced that they plan to stop pressing vinyl. I wish people would stop crying about it. We as music lovers have been blessed with a superior format which is only beginning to show its true sonic potentials. The latest all-digital recordings I've heard are certainly the sonic rivals of even the most expensive analog front ends. This is something we should be happy about. It is no longer necessary to spend megabucks for a first-class front end, which

allows more of our budget to go to a larger variety of musical software, which is what it's really all about!

I have to say, however, that *Stereophile* is the best magazine of its kind. I've read most of the others, but choose only to subscribe to your publication. *Stereophile* is the most informative, useful, accurate, and entertaining high-end magazine out there—keep up your good work.

**Steven D. Philipczak**

Owner/Manager, CD Exchange  
Shillington, PA

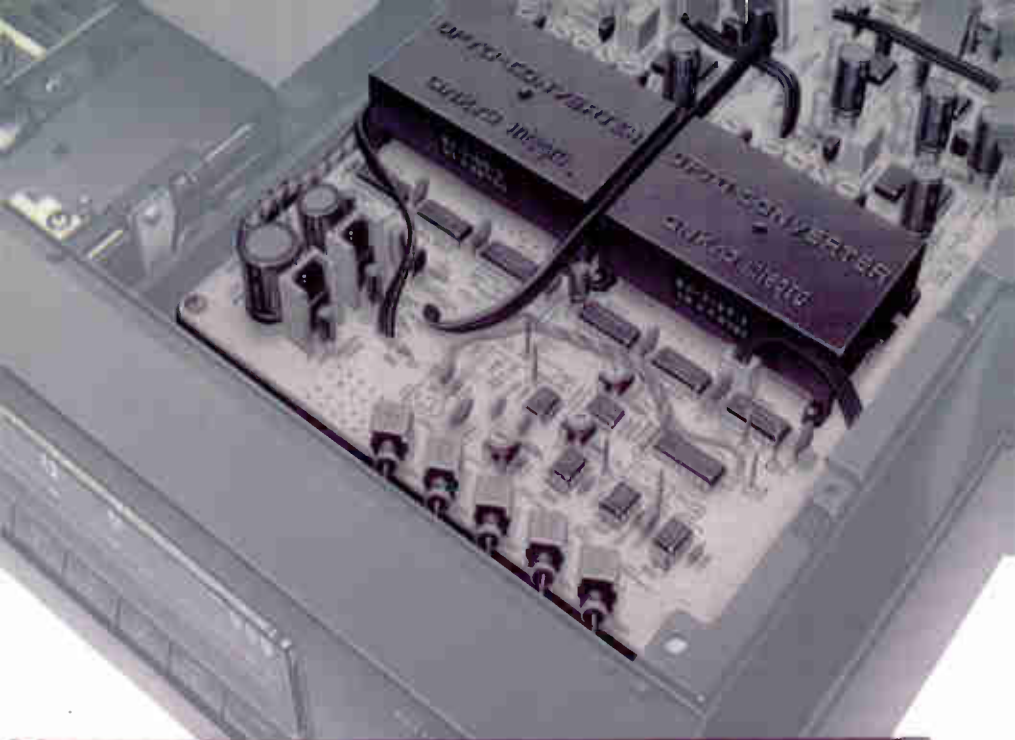
## HiSnaCraP

Editor:

HiSnaCraP. That's what it's all about; all the rhetoric about analog *vs* digital. Those who claim that more information can be gotten out of an analog LP groove than from an all-digital CD "because their ears tell them so" have sick ears. Or, rather, brains that need de-programming.

The golden-eared analogists grew up on analog. Their brains became accustomed to analog with all its faults, and learned to put in an "analog" filter that could largely ignore hiss, snap, crackle, and pop. Along comes CD. No *biss*, *snap*, *crackle*, or *pop*. Yet when "recorded" music is heard, the brain expects HiSnaCraP, and puts its analog filter in place. Result, negative HiSnaCraP *put into* digital sound when that is being played. This will continue until the golden-ear is deprived of analog HiSnaCraP for long enough that it accepts noise-free digital as the new standard, shuts off the analog filtering, and begins to hear digital's own unique subtleties.

Anyone who has shot 35mm motion-picture film as still film with the proper 85 (salmon/orange-colored) filter in daylight may already have the proof of this argument within the (parallel) visual domain. I experimented with this film in the '70s (Eastman 5254 and 5247). I used the 85 filter, as is normal in filmmaking. When I first started this, and pulled my SLR eyepiece to my eye, everything turned orange. Within a few weeks, however, the same action produced normal-colored views; my brain had computed its own filter to correct for what it knew was "right." For several years, no problem. Then I converted to regular Kodachrome. Away went the filter. I put the camera to my eye, and everything turned blue (the "negative" of orange). It took several weeks before this wore



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off and I once again saw normally through the viewfinder. Switch for but one roll back to 5247, and the orange reappeared for a few seconds, then corrected to normal color. It took cold turkey with Kodachrome (only) for many months before the brain cleared itself completely of the filter it "wanted" to put in place.

The golden-eared analogists must similarly go cold turkey on LPs if they are ever to hear CDs fairly.

Further, a simple matter of mechanics. If anyone ran the pens on their frequency-response recording devices at full speed, rather than slow, the mechanical resonances of even the best pickup would be seen to be so absurd as to be laughable.  $\pm 20\text{dB}$  would be seen as common for a graph that at slow pen speed shows  $\pm 2\text{dB}$ . No mechanical pickup is truly "smooth."

**W. A. Storrer**  
Newark, NJ

## High-end QC

Editor:

I wholeheartedly agree with the point made by JA regarding changes to samples supplied for review. ("As We See It," Vol.12 No.2).

We have been thoroughly spoiled by the quality typical of the large consumer products companies. With their large staffs and the vast amount of training provided to key quality personnel, they can afford to investigate all of the parameters, methods, and statistical controls necessary to assure near-perfection in every unit. But this level of perfection is rarely available as you approach the state of the art.

JA's Radio Shack TRS-100 laptop computer is an excellent example. It is a good mass-market item, of which Tandy Corporation has sold tens of thousands. Their engineering was done, and is not being improved upon, since it is not a state-of-the-art device. The responsibility has been turned over to the professional perfectionists in manufacturing and quality. The huge investment in test equipment, detailed procedures, and the testing itself has been amortized over the entire production run.

The majority of the manufacturers of high-end audio gear are smaller companies usually headed by designers of the equipment. These firms are typically marginally capitalized, and are not able to invest the considerable sums necessary to assure the quality levels we have become accustomed to in the consumer mass

markets. The typical SPC (Statistical Process Control) or equivalent quality-assurance program costs roughly the same amount of money to implement, whether your firm is General Motors or Fred's Sound & Salami Co.

Additionally, the production lot sizes typical in the industry lead many manufacturers to the "build it and fix it" (BIFI) production methods typical of "Handcrafted" products. While this methodology may work for Rolls-Royce, the complexity of today's audio equipment precludes BIFI assembly programs from working with any measure of success.

State-of-the-art manufacturing equipment is similar in many respects to audio gear. The total manufacturing runs are small. The cost is high. Ultimately, state-of-the-art performance is demanded. In exchange, it takes a bit more than removing the unit from the carton to make it work.

At ProSystems, we have an active quality-assurance program. Our sound-reinforcement (read: high-efficiency) products are built right the first time. It's expensive to maintain the QA program. My banker has, on more than one occasion, questioned my sanity after reviewing the total cost of the quality program. My accountant has offered me a white coat with very long sleeves. My customers think it's wonderful. Keep in mind that we produced more units last month than the worldwide market for high-end power amplifiers will be this year.

When the discussion turns to high-end audio gear, we must bear in mind that, all too often, leading-edge technology is ragged-edge technology.

**Adolph W. Santorine**  
President, ProSystems, Meadville, PA

## A love-hate relationship?

Editor:

I have been following the love-hate relationship between VTL, its customers, and members of the audiophile press for some time now. The recent conflict between VTL and Mr. Belterri (Vol.12 No.2) prompted me to throw in my two cents worth. I have never doubted that VTL makes an excellent-sounding product. My brief listening to a VTL amp at a stereo show confirmed this. I cannot say I thought it was any better than other excellent amps, but this was an informal audition under adverse conditions.

What I thought of the amp's sound doesn't matter, however. If they were the best-sounding amps in the world, I wouldn't own one for



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a simple reason. When I drop four or five thousand dollars on a piece of equipment I expect the product to be backed by a quality company. I want someone there to answer the phone when I call, be courteous and helpful when I have a question or problem, and be prompt in servicing my gear. From what I've heard, VTL does none of these. Why not buy an amp from Audio Research, Mark Levinson, or one of many other fine companies that treat their customers right? They offer great-sounding products, plus the support I expect with a major purchase.

**Jeff Bergman**

Mt. Laurel, NJ

PS: I own a Mark Levinson No.23. The amp sounds great, and dealing with Madrigal has been nothing short of a joy.

## Customers aren't always right

Editor:

Since I own some VTL equipment and write for another magazine, I should perhaps just bite my lip and contain a sense of outrage at the exchange of letters in your February issue. However, I'm also a *Stereophile* subscriber of some years' standing, so I have some interest in seeing this magazine maintain the sort of standards that make me look forward to receiving it each month.

Is it responsible to publish a letter like R. Belterri's, one person's disputed account of experiences with a company, with no cited evidence that this represents any larger pattern of customer relationships? From the results of your reader survey in January, there are lots of people who would not buy products again from any given manufacturer: presumably the reasons include product quality, manufacturer responsiveness, and simple upward mobility. Are all these to be future letters-to-the-editor?

For that matter, is it responsible to publish a letter (as in December, from Ben A. Tupper) that says that Thiel 3.5s can't deliver real bass? We're not told what the level was when "the 32' pipes kicked in" (sort of like hyperdrive, I guess), and that if you don't agree that CLSes are the only things that sound like real music "you didn't listen very well." I can accept an unsupported recommendation and go listen for merits in my own value system in my own good time, but I do think that condemnations deserve a bit more care and documentation.

To return to the Belterri/VTL exchange: What I find most upsetting is your moralizing

about the issue. "When a company attempts to prove to one of its customers that he or she is in the wrong, winning that argument will always cause it to lose in the broader scheme of things." That is only true if the press chooses to publicize the story told by the customer. In this case, as you say, both parties can not be telling the truth. It is a fact that Mr. Belterri has his money back; I suspect that his ears are still ringing from David Manley's good-riddance message. But he has no overriding interest in the matter, except possibly some wounded self-esteem; on the other hand, David Manley sells amplifiers, and reputation is important.

For me, his response brings back pleasant memories of an incident at Tiffany's 15 or 20 years ago when an ad was run with some typically arch copy: "Not for those who have to punch time-clocks." (That wasn't exactly it, but it was in the same spirit.) The president of a local union held a press conference to announce a boycott of Tiffany's because of its elitist attitude toward labor. Walter Hoving, then still chairman, held a briefer press conference where he announced that he had revoked the union leader's charge account, concluding that "there is some crap that retailers don't have to take."

Customers aren't always right, nor are readers. Editors should therefore exercise some restraint.

**Michael Allen Fox**

Banks, OR

## A mean-spirited fibber?

Editor:

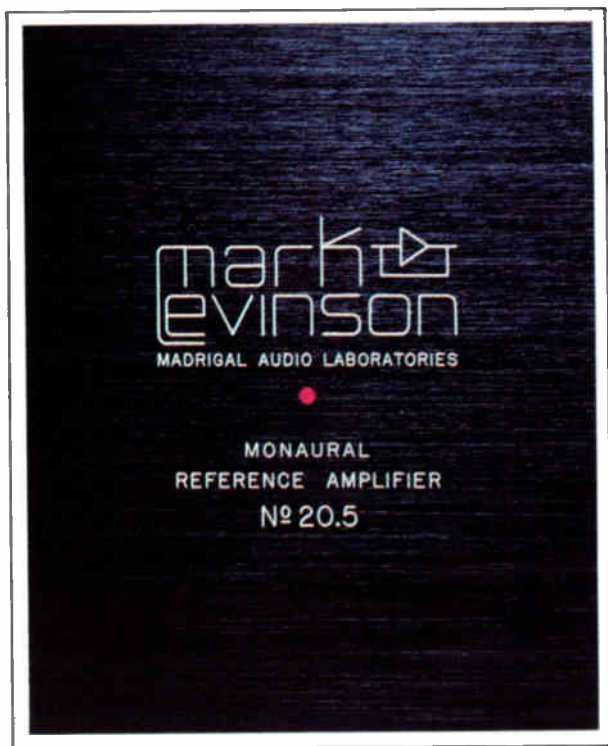
Besides demonstrating that he is a mean-spirited fibber, was there any reason to print R. Belterri's letter regarding VTL in the February issue? David Manley of VTL provided you with written documentation, and he also gave Belterri his money back. If VTL's only offense is to decide that a customer was not worth the trouble, I hardly think that he deserves to be libeled in your influential "Letters" column.

**Seth Godin**

Mount Vernon, NY

*Our policy toward including letters of complaint in the "Letters" pages is as follows: It is rare for us to publish the first letter we receive complaining about poor service from any one company. But if we continue to receive letters about that company, then we feel that at least one should be published,*

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allowing the accused the right of reply, of course. Such was the case with VTL and I felt that the readers of *Stereophile* should be given the opportunity to judge for themselves whether VTL had given Mr. Belterri cause for complaint. The preceding three letters were all that we received concerning this affair and, putting aside the letter from Mr. Bergman, which is apparently based on hearsay, it would seem that the majority do feel that VTL acted in a correct manner. —JA

## Tube misinformation

Editor:

I am troubled after reading JA's review of the VTL 100 (November '88) and JGH's review of the Audio Research M300 (December '87). While both are informative and entertaining reviews, the writers both attribute major circuit innovations to the wrong designers.

I feel that it is important to remember the innovations of audio's pioneering engineers, such is their legacy to us. In this spirit and without detraction from JA, JGH, William Zane Johnson, or David Manley, I offer the following:

The partial triode or "ultralinear" output circuit was invented and patented (UK) by Alan Blumlein of EMI in 1937.<sup>1</sup> This name should be familiar to many audiophiles as the man who invented single 45°/45° groove stereo disc recording and the coincident microphone technique that bears his name. These inventions languished in light of the approaching war in Europe and Blumlein's untimely death.

The ultralinear circuit was reintroduced in 1951 by David Hafler and Herbert Keroes,<sup>2</sup> when it found the wide acceptance which endures to this day. There has always been debate about the optimal location of the screen taps with respect to the plate and B+ ends of each primary half, with common values ranging from 18% to 46% of the turns from the center tap.<sup>1 2 3 4</sup> The exact location does have an effect on final performance with any particular output valve and load characteristics, but

this does not detract one whit from the spirit of the circuit.

D.T.N. Williamson's name is often mistakenly associated with the ultralinear circuit. For example, the popular 1954 Heathkit W4AM amplifier was billed as a "Williamson" type, with the manual implying that the ultralinear output stage was the salient feature. The main features of the Williamson circuit are a particular configuration of voltage amp direct-coupled to a single triode phase splitter and a triode output stage.<sup>4 5 6</sup> Williamson himself reacted strongly when Hafler and Keroes published their "update" of his amplifier,<sup>7</sup> and joined forces with Quad's P.J. Walker to write a strong rebuttal of their claims of improved performance.<sup>8</sup>

The Williamson and Walker paper gives the nod to the Quad output circuit, which is essentially similar to the McIntosh "unity coupled" circuit in the US. The ultimate development of this circuit appears in a late 1960s patent by Mile Nestorovic (assigned to McIntosh) which describes not just plate and cathode windings in the output transformer, but also a separate winding for screen grids. In this manner, negative feedback is provided to both cathodes and screens, with the load distributed among all three sets of electrodes. An examination of the ARC M300 circuit shows the same basic technology, with the addition of a power MOSFET between each screen and its transformer connection. A cynic might note that the M300's introduction closely coincided with the expiration of the Nestorovic patent.

There has always been a similarity between McIntosh and ARC output stages. The "partially cathode coupled" circuit found in older ARCs applied negative feedback to and loads the cathodes as does the Mac unity-coupled circuit. However, where the Mac has the same turns ratio for plate and cathode windings, the ARC does not, a single winding serving both load and cathodes. While the turns ratios are quite different, the use of a common winding

1 *High Quality Sound Reproduction* (pp.302-303), James Moir, Macmillan, 1958.

2 "An Ultra-Linear Amplifier," David Hafler & Herbert I. Keroes, *Audio Engineering*, November, 1951.

3 "Audio Designer's Handbook," Parts I & II, Ampere Applications Engineering Lab, *Audio*, January & February, 1960.

4 *Radiotron Designers Handbook*, Fourth Edition, F. Langford Smith, ed., RCA Victor Division, RCA, 1953, pp.570, 346, & 595, respectively.

5 "Design for a High-Quality Amplifier," D.T.N. Williamson, *Wireless World*, April & May, 1947.

6 "High-Quality Amplifier—New Version," D.T.N. Williamson, *Wireless World*, August, September, October, 1949.

7 "Ultra-Linear Operation of the Williamson Amplifier," David Hafler & Herbert I. Keroes, *Audio Engineering*, June, 1952.

8 "Amplifiers and Superlatives, An Examination of American Claims," D.T.N. Williamson & P.J. Walker, *Journal of the Audio Engineering Society*, April 1954 (reprint from *Wireless World*, September 1952).



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is not a significant difference (transformers and autotransformers can serve the same function). In fact, some output taps on the original McIntosh design were taps on the cathode winding.<sup>4</sup> Whatever the similarities may be, ARC has succeeded in producing consistently lauded amplifiers, while the sonic reputation of the tube McIntoshes is controversial, to say the least.

**Kevin Hayes**  
Durham, NC

## Music reproduction should be fun

Editor:

It was amusing to read Peter Reichelt's letter in the January 1989 issue. He managed to get on his soapbox for a page and a half and expound his virtues regarding his musical tastes and high-end audio. Obviously, Mr. Reichelt took Chuck Coronato's letter in the June 1988 issue seriously. Not knowing Mr. Coronato or Mr. Reichelt, one can obviously gather that Mr. Coronato's humorous blurbs were quite intentional and sailed way over Mr. Reichelt's head. It is a shame that some "audiophiles" take this pleasurable pastime so seriously. After all, music is to be enjoyed in every expression, be it Classical, Rock, New Age, etc. Mr. Reichelt seems to feel that his opinion is what should be digested if one is to be a true judge of musical reproduction. Listeners should become as familiar as possible with the music they prefer, and use that to evaluate their purchases. Without this, true personal evaluations would be impossible. A reviewer should evaluate by using all types of music, since a wide variety of people with varied musical tastes trust his or her opinion.

It is obvious that certain equipment is better suited for a particular music. So, Mr. Coronato's letter put things into perspective. High-end audio should be enjoyed as a pleasurable hobby; just remember to keep it in perspective. By all means, one should be critical about musical reproduction, but not overzealous to the point of being pompous. After all, it's meant to be fun, isn't it?

**John P. Kady**  
South Hackensack, NJ

## The case against live music

Editor:

In response to criticisms in *Stereophile's* "Letters" column aimed toward the "other 99%" of your readers who responded to your survey,

I'd like to suggest that there exist justifications for rarely attending live concerts.

Many of your readers' preferences lean toward various forms of rock and jazz music. There is (arguably) a much greater disparity of taste among rock and jazz listeners than among classical listeners. In addition, rock listeners are rarely satisfied with seeing *other* musicians perform the music of their favorite composer-performers. For these reasons, in many areas there are few opportunities to attend a concert of interest.

Even when such an opportunity arises, the concert-going experience is clearly *not* a chance to hear good-quality sound. With the possible exception of dynamics and maximum SPLs, amplified rock and jazz music can be reproduced far more pleasingly in the home than in a concert hall. (As you know, there exist many well-recorded examples of rock and jazz music which demonstrate that the presence of syncopation need not imply the masking of distortions in the reproduction chain. Even if one doesn't believe that electric guitar or electric organ can demonstrate clarity, consider the quantity of rock and jazz recordings containing voice, piano, strings, woodwinds, brass, and percussion instruments.)

If one's taste runs to the electric, the concert venue may be a small nightclub or bar, where the opportunity to participate in the concert experience may require one to endure long drives, poor opening acts, and standing-room-only conditions.

Lastly, for the price of a pair of concert tickets, one can buy several new LPs or CDs, which can be enjoyed for years.

In spite of these grievances, the rock or jazz concert experience can be a profoundly moving experience. Though it may (unfortunately) surprise some, there are many mature, intelligent individuals in this world to whom certain forms of rock or jazz music "speak with mind and heart," and for whom many examples of classical music are "frivolous." And neither the aging process nor exposure to countless classical recordings and concerts can "cure" them!

**Ralph Gonzales**  
Newark, DE

## Is this man serious?

Editor:

You people are all crazy. You always think that *more expensive* equipment is *better*. Well, I

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can't see spending \$300 for a pair of speakers. Hell, I could buy a color TV for that amount! No sir, I'll stick with my Supersound XLT stereo system. It has a dubbing deck, a turntable (with arm and cartridge!!!), a receiver, and two genuine woodtone speakers (with wires!!!), all for \$69.95. It even has a hookup for a CD player so you can upgrade it. It might not have the gold-plated terminals of your reference equipment, but it plays loud enough to hurt your ears and to make the dog howl (and that's without even turning up my hearing aids!). So cancel my subscription and send me a check for the remainder of the issues. Hell, I could use that money to buy an extra pair of XLT woodtone extension speakers for the patio!

**I. M. Curmudgeon**

Yountville, CA

PS: By the way, does JGH do reviews of hearing aids yet? Mine are at least Class C.

## Shocked?

Editor:

I am a fairly new reader of *Stereophile*, and I must say I've been rather surprised (shocked?) by some of the things I've read so far. Either you have some very rich readers, or the equipment prices in your magazine are someone's idea of a sick joke. Before you start yelling "heretic," hold on a minute and hear me out.

I am employed as an audio engineer at a Washington, DC television station, so I believe I have a good grasp on what a decent piece of pro audio or consumer-grade gear should cost. I don't think that one should have to put a lien on their home for some gold-plated amplifier, however. Nor should one spend \$10,000 on a pair of speakers for the den if they're happy with a \$900 pair. Are high-end fans so concerned about owning the right "names" that they are willing to place themselves in financial jeopardy? Got some real puzzlin' priorities happening here, folks!

If I'm pleased with a particular piece of gear, I'll keep it and enjoy it, no matter the name or the cost. If my high-end friend up the street hooks a 'scope up to it and pronounces it "crap"—so what? If I like the component, if it sounds good to me, I'm happy. If my friend's idea of happiness is shelling out big bucks for some Mark Levinson goodies, if he likes big transformers that spin his electric meter like a top, great! As for me, I don't feel that I need them for satisfying sound in the home.

But wait—all pro audio guys are high-end fanatics too, right? Nope, not all. In the studio, in a professional application, expensive and discerning gear is fine and necessary. Many big-ticket items are the tools of my trade, and that's fine too. But I fail to understand a mentality that would spend about \$60,000 on a rig for the living room—I mean, how do you justify the cost for something to spin a disc on—unless you're a lab freak that has to measure everything measurable. Status? Gee, a BMW is cheaper!

Let's get real: about 90% of your readers can only look and hope, right? The other 10% are rich spuds with mammoth systems, right? So what shall we say to this whole matter? Don't get me wrong—I enjoy the reviews (even if the rigs are expensive to the 11th power) and the writing, along with who is trying to outdo who, and negative THD ratings. *I like the mag!* I just can't swallow the prices! But hey, I'll keep reading, you can bet your platinum preamp on that. And I just might find something I can afford after all, if I look hard enough.

Now, wouldn't that be neat?

**Gary Morgan**

Manassas, VA

## Price vs performance?

Editor:

I've been an avid reader of *Stereophile* for the past two years and must say I thoroughly enjoy most of the magazine. The record reviews, however, are a different matter: is it true the reviewers are paid by the word? I don't know how many times I've read a review and had no idea whether the reviewer liked or disliked the record. There are times when my mind slips back to simpler times and I hear, "I think it really rocks, Mr. Clark. I give it a 92." They may not have expressed an exacting view of the hall's ambience, but you knew whether or not they liked the recording.

My primary reason for intruding on your time is the publication of two letters in the December 1988 issue (Vol.11 No.12). One is by would-be engineer Scott Enright and the other by William Cowen. Mr. Enright writes, "I am not going to sit here and tell you I have golden ears, and I can clearly hear a difference between zip cord and the good stuff. The truth is, I can't tell the difference, but that does not instantly make my purchase of some of the good stuff invalid or crazy." When, and if, Mr. Enright enters the "real world" as an engineer

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and tries to employ this same philosophy, he'll be in for a rude awakening. "Gee, Mr. Smith, I don't know why your new building cost seven million dollars more than we projected, but I'm sure you got a better building for it." Mr. Enright would soon find himself bagging groceries at the local supermarket.

Mr. Cowen was agreeing with Mr. Rico when he wrote "Mr. Rico is correct—if *music* is what you want, Carver, Polk, and Klipsch will simply leave you wanting." It obviously leaves Mr. Rico and Mr. Cowen wanting; but why are we to assume that it leaves the owners of that equipment wanting? If my stereo system cost three times more than my neighbors', does that mean I enjoy music three times more than they do? All it really means is that I was willing and able to spend more on my system. Is a \$10,000 power amp really ten times better than a \$1000 amp? The only significant gain for the dollar is at the bottom of the audio equipment scale, say from a \$200 all-in-one unit to a decent but not overly expensive system of separates. The three gentlemen mentioned above all imply that music enjoyment has a direct correlation to system cost. I guess only the truly indebted or the truly wealthy know the full enjoyment of recorded music.

**Ross Heatwole**  
Grand Rapids, MI

## The mono CD problem

Editor:

In Robert Levine's February '89 review of Bizet's *Les Pecheurs de Perles*, he stated that the recording requires "either a switcher or a mono button on your preamp" for dual speaker playback. Since I have integrated components, my only option is the switcher.

While I'd prefer to avoid homemade "Y" connections for each channel, I seem to have no other option. *None* of the better audio stores in my area have switchers in stock, nor are they able to tell me what a switcher is. The circuitry is obviously simple, but I'd like my circuitry as canned as possible.

Where do I order an inexpensive mono switcher from? Do I need one or two?

Are these mono-only, single-channel CDs really the wave of the future for mono recordings? Or are CDs like this merely an anomaly? Even more important, didn't Le Chant du Monde make an inconsiderate mistake by failing to inform shoppers of the potentially troublesome recording format these new discs

have to offer? I'm certain I'm not the only listener baffled by this technique.

These problems aside, however, his review was as accurate as a review can be. The performance and recording quality are both *excellent*.

Please respond. Or, even better, publish your response so that your other readers and Le Chant du Monde can profit from the information.

**Neil Ross**

Minnetonka, MN

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—RL

## Sound rings & sound

Editor:

Amplifiers, speakers, interconnects, etc. really do sound different, even when we cannot figure out measurements that are symptomatic of the differences. Hence the value of subjective evaluations, as practiced by *Stereophile*. There is one audio product on the market, however, for which we do not need to be content with subjective evaluations—sound rings for CDs. Advertisers and some reviewers claim they make CDs sound better. Given the digital nature of CDs, there are a limited number of mechanisms that can be responsible for the claimed improvement. In this case we ought to be able to measure the difference. Here's why:

There are three main steps in converting a CD into an analog audio signal. The first step is to read the CD with a laser to produce a raw bit stream, which includes a significant proportion of redundant data. In the second step, the raw stream undergoes demodulation and error correction to produce a corrected bit stream, intended to be exactly the same as the bits of the studio master. Error correction uses the redundant bits to make up for errors in reading the CD. Finally, the corrected bit stream goes through D/A conversion to produce the analog audio signal.

If sound rings really do change the sound of a CD, then it has to be true either that the corrected bit stream produced is different when a ring is used, or that the D/A conversion process is different. (The latter could be caused by interactions through the power supply, say, if

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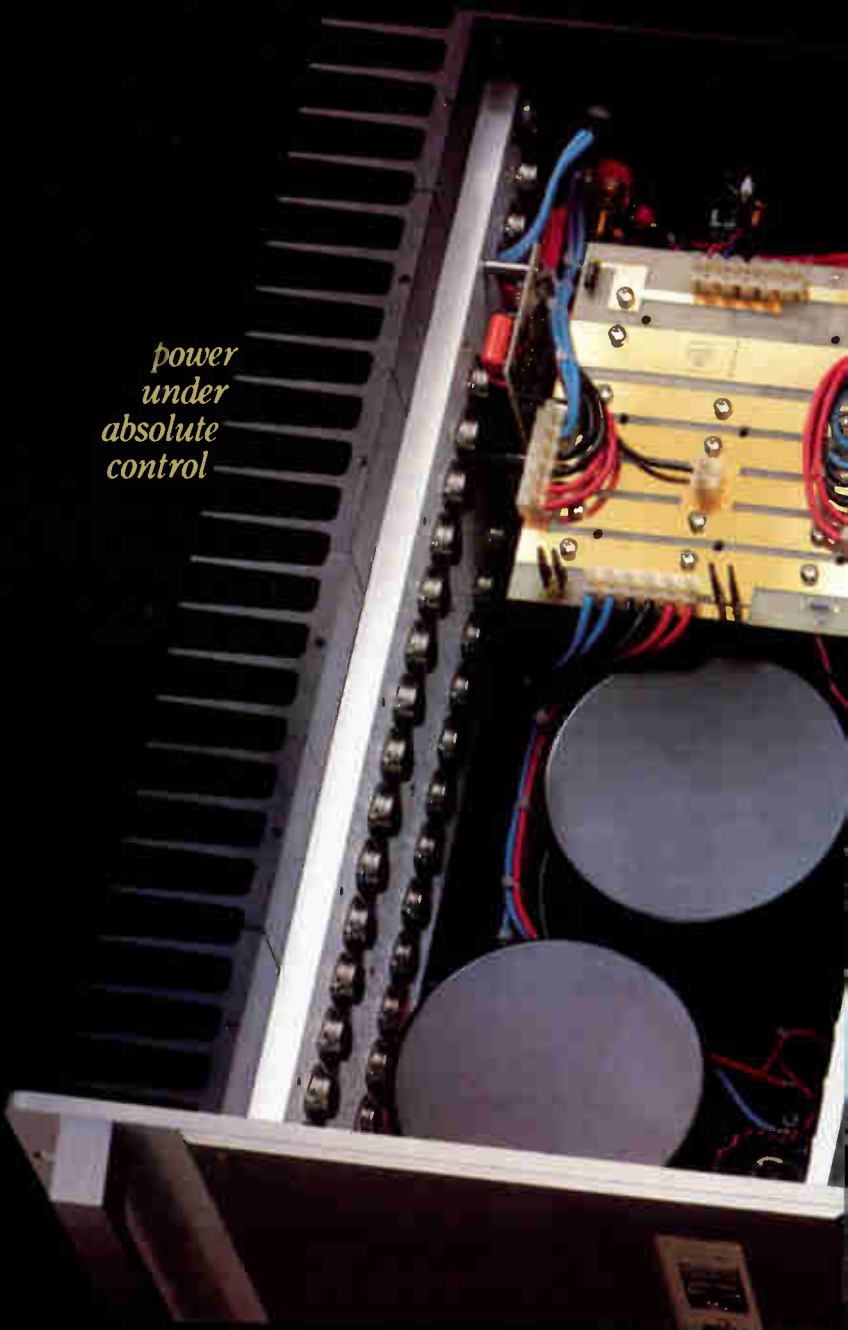
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the error-correction circuits worked harder without the ring.) Eliminate the second possibility by using a two-box CD player, where the corrected bit stream travels by optical fibers between the boxes. Now you ought to be able to use a computer to compare the corrected bit streams with and without rings. If they are the same, then there can be no difference in sound. If you still hear a difference, and everything else has remained the same, then it's your imagination. If the bit streams are different, then we've learned something important—the error correction in that player isn't doing its job.

Here's a great opportunity for you to take a little of the mysticism out of hi-fi. Try the experiment and report the results in your magazine.

**Michael D. Schroeder**  
Cupertino, CA

## Evaluation & sound

Editor:

I would like to express my high level of satisfaction with *Stereophile*, particularly with the intelligence, fairness, and reasonableness of its editorial direction. If there is room for yet more commentary on burning issues of the day, please accept the following thoughts:

There is no more reason to expect a reviewer of high-end equipment to be able to discriminate between two amplifiers with a voltmeter than to expect a sommelier to be able to discriminate between a '73 and '82 Chateau Petrus with a pH meter. High-end reviewing is, today, like wine-tasting, a largely subjective undertaking. While it is conceivable that a chemist may someday be able to run a sample of wine through a mass spectrometer and conclude that it is an '82 Petrus, today, at least, we rely upon wine-tasting experts for such analyses. It is human nature, however, to strive for objectivity, particularly in matters of the pocketbook. Hence the controversy and vitriol which fly in response to unpopular reviews. Though we should strive to understand and measure the factors which influence the quality of sound, we should not let that quest obscure the fact that today we are still largely reliant upon subjective methods for this purpose.

An example of blind faith in objective evaluation was recently provided by a well-known underground reviewer who developed some sort of digital waveform analyzer, and proceeded to draw correlations between gross acoustic observations and subtle waveform

modulations occurring on the order of ten-thousandths of a second. While it may ultimately be possible to draw empirical conclusions in response to this type of observation, such conclusions can, by their nature, be made only after observing the correlation in many, many instances, not simply for one CD player.

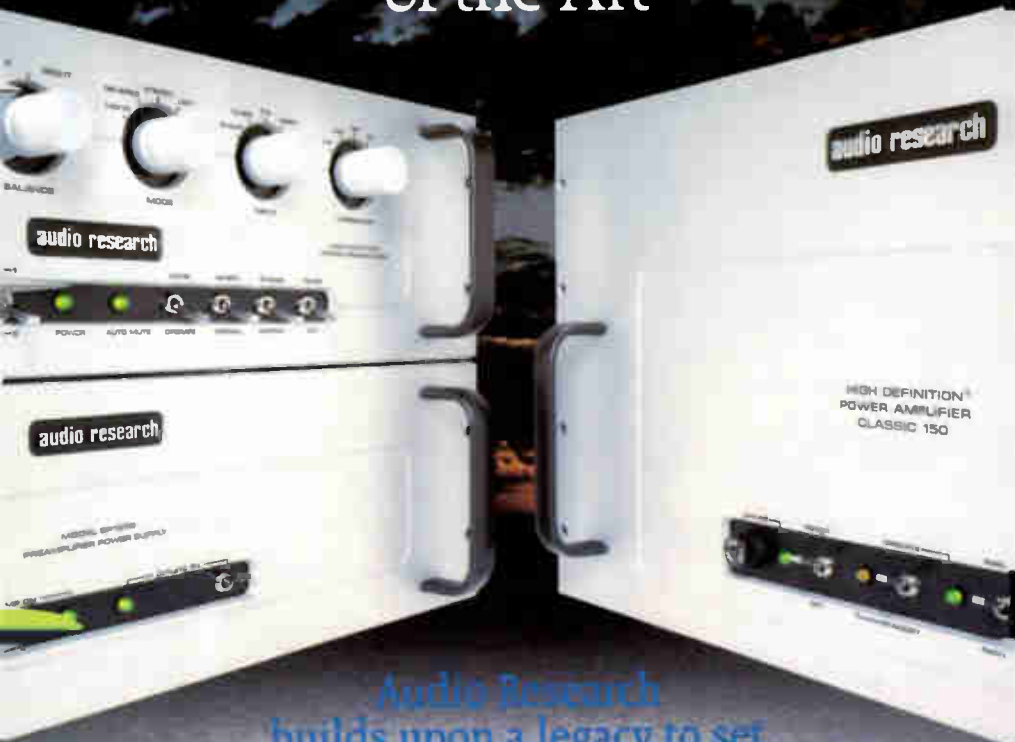
Accepting, then, subjective evaluation as a necessary tool for high-end evaluation, we should consider ways to enhance the validity of the method. At least three practical means are available which could help reduce cynicism about the high end. These methods are: 1) reliance exclusively upon acknowledged experts; 2) use of blind evaluations; and 3) insisting upon a consensus (*ie*, general agreement among experts) on each conclusion, consideration being given for differences of individual preference.

First, by relying only upon the opinions of experts, we can reduce criticism which is based upon accusations of incompetence. In the scientific community, participants anoint their own experts, and charlatans are rapidly identified and rejected by their peers (who include the editors of their journals). Also, by relying exclusively upon acknowledged experts, naive criticism is reduced because the critic's level of expertise must then be comparable to that of the author they are criticizing. Simply because someone offers a criticism does not mean it is valid.

Second, even the most objective evaluations should be made blind, because we humans are simply too suggestible to avoid the biases of our personal predilections. The objective of the exercise, however, should be to develop an environment and evaluation methodology conducive to the replicability of a conclusion by an observer, not to subject the reviewer to a hostile environment of a cynic's design. Accordingly, a reviewer should be able to design his own review technique, subject only to independent expert confirmation that the technique indeed is blind to the reviewer.

Third, the validity of an observation is enhanced in nearly geometric proportion to the number of times it is independently confirmed. Indeed, scientific conclusions which cannot be confirmed are discarded. This suggests that conclusions reached by a subjective review should be subject to independent confirmation by other experts unfamiliar with the conclusions of the first review. Simply because

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we accept a subjective methodology does not also oblige us to reject a scientific attitude. If the conclusions are similar, then a higher level of confidence in the results will exist. If the conclusions differ (again giving consideration to differences of individual preference), then an attempt should be made to reconcile the differences in order to avoid inflicting an ambiguous conclusion on a naive public (in the sense that the public are not all expert). If no consensus can be reached by several experts, then the public should be so informed so it can make its own judgment.

I would suggest that application of these principles could have substantially reduced the type of reaction received in response to the cable survey, even if the conclusions had been the same. While I do not imply any question about the expert qualifications of Mr. Olsher, a firm editorial stance on the independent and blind reproducibility of the conclusions of the survey could have saved much printer's ink and possibly a few subscribers.

The only argument against implementing the described or similar scientific review techniques is an economic one. I would suggest, however, that the economic argument is short-term, and inconsistent with an editorial policy which seeks the truth. Without improvements in subjective reviewing technique, the long-term success of the high-end industry would be impaired. Objectivists could prevail and our beloved monthly fix be reduced to a collection of spec sheets.

But keep up the good work. January's issue was a real home run. I may not be in the market for a \$400 pair of speakers this month, but I find it very useful to be able to make recommendations to my friends who are intrigued by this business. And it is refreshing to have someone like Brian Cheney to occasionally poke fun at our pretensions. Good listening!

**Willard Rosegay**  
San Francisco, CA

## Sound & blind tests

Editor:

I think you are being a bit of a tease when you print highly convincing arguments in favor of double-blind product evaluations, and then decline to institute them in *Stereophile*.

How about giving these methods a fair trial?

**Jerry Block**  
New York, NY

## Blind tests & statistics

Editor:

In his coverage of the 85th Convention of the Audio Engineering Society, John Atkinson (January 1989) reports results from listening tests conducted using the ABX box. His conclusions concerning the overall results are correct from a statistical point of view. The results reported for both amplifiers and cables result in nonsignificant chi-square values (assuming independent, chance responses).

However, John Atkinson is incorrect concerning his own test results. Neither 4 out of 5 correct (amplifiers) nor 5 out of 7 correct (cables) is better than a coin toss using conventional criteria for determining statistical significance. For example, by chance alone, a true coin will show heads *at least* 4 times in 5 trials about 19 times in 100, whereas statistical significance would be attributable only if this outcome occurred no more than 5 times in 100. Similarly, for 5 heads in 7 tosses, the chances are about 23 in 100. Even if we combine the two tests, giving 9 out of 12 correct identifications, this would occur a little more than 7 times in 100 due to chance, and fails to reach significance. Sorry, John, but it requires 5 out of 5 on the amplifiers and 7 out of 7 on the cables to yield significant results (combining the two tests, it required 10 out of 12). This undoubtedly reduces the number of listeners to whom you can attribute discriminating powers. Indeed, there is a further consideration. The probabilities reported above are for a single trial of 5 (or 7) coin tosses. If you repeatedly conduct trials of 5 tosses, the likelihood of some sequences with 5 correct (or 5 incorrect) becomes very high (imagine tossing a true coin 5 times and then repeating this experiment, say, 100 times; you will almost certainly see 5 out of 5 at least once). Thus, in the final analysis, maybe Michael Fremer, *et al*, were just lucky coins.

**C. Mitchell Dayton**  
Annapolis, MD

*In response to Mr. Block, I have examined at length in the past why we do not believe double-blind ABX tests are the most effective—or, more importantly, accurate—way for our reviewers to reach informative value judgments. I readily admit that the differences described in this magazine do not have the weight of traditional double-blind tests behind them. However, our descriptions of the sounds of components are open to any reader to test.*

# WHAT THE EXPERTS SAY ABOUT THETA DIGITAL

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"...the best sound ever from CD..."

—Lewis Lipnick  
*Stereophile* Vol. 12 No. 3  
March 1989

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—Peter Moncrieff  
*International Audio Review*



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*All he or she has to do is to walk into a dealer's showroom and hear for him or herself whether our judgments are correct. If they do appear to be so, why should we then have to involve ourselves in prolonged double-blind tests to satisfy those who, in any case, would not be interested in the results?*

*Regarding the AES listening tests, I did note in my report that my scoring 9 out of 12 identifications was not statistically significant. My point, however, was to ask that when each of a largish number of people, all professionally involved in listening critically to hi-fi equipment, only just fails to achieve significance, isn't this in itself significant? For example, if you lump my score on amplifier identification with those of Michael Fremer of The Absolute Sound, then, out of 10 attempts, we achieved a significant 9 identifications by ear alone.*

*Mr. Dayton implies that even this would be proved to be due to chance if only the testing had been more prolonged, with apparently discriminating listeners revealed merely to be "lucky coins." On the other hand, I was surprised to find that some people had done so well under what were undoubtedly "hostile" conditions and speculated that this might be significant. Which of us is actually correct, however, seems to depend on what you need to prove. I felt that the results indicated that a blanket dismissal of audible differences was, to say the least, heavy-handed. It appeared that the panel at the AES workshop in general agreed with that feeling. Mr. Dayton, however, would apparently have liked listeners to have continued with the tests—each set of five amplifier comparisons took almost an hour—until their powers of discrimination would be swamped by fatigue. A tidy result indicating that "all amplifiers sound the same" of course would then be produced.*

*As I have said before in these pages, this whole debate concerns belief systems, not facts. Whether you are an "Objectivist" or a so-called "Golden-Eared Subjective Reviewer," you pick the conclusion that best fits your belief system—but then you should get on with your life. If someone is disturbed by the discussion of audible differences between hi-fi components in Stereophile, then I have to ask him why he is reading this magazine when, for example, Stereo Review concerns itself almost totally with equipment reports that attempt to indicate that any audible differences are*

*either illusory or irrelevant. (The only recent exception was Ken Pohlmann's report on CD players in their December 1988 issue, and I was not surprised to read the almost totally negative reaction from SR readers in subsequent issues concerning his conclusions concerning positive identification under blind conditions. As I said, we are talking beliefs here. Incidentally, for those who "know" that all audible differences are due to variations in frequency response, did you notice that two of the machines distinguished by ear to a statistically significant degree—a 99.9% confidence level—in the Pohlmann tests, the Denon DCD-1520 and Cambridge CD2, had identical amplitude responses?) —JA*

## **Where is more Zappa?**

Editor:

I understand that RL likes (or perhaps worships) Frank Zappa's music, and enjoys reviewing it, but with an artist like Zappa that doesn't help your readers make purchasing decisions. Personally, I like only small samples of Zappa's music, but perversely enough almost none of it (only *Hot Rats*) is available on CD (or any other way, for that matter) at this time. Where, oh where, are *Burnt Weeny Sandwich*, *Chunga's Revenge*, *Live at Fillmore East*, *Just Another Band From L.A.*, etc.??

I thought the "Letters" column in the February issue very thought-provoking. In John Koval's opus, it would have been nice if he had referenced or footnoted some of his statements—eg, "broadband frequency differences of as little as 0.2dB or better in the midband appear to be detectable through careful listening." Also, his "objectivists" don't include the hi-fi glossies, since, barring one or two recent exceptions, they use only non-blind listening tests, depending almost entirely on measurements to evaluate components. Where do these "objectivists" report, other than sporadically in *JAES*? By the way, if Mr. Koval is an audio professional, it would have been appropriate to include his professional affiliation, if any.

I'm sure many of your other readers must wonder how practical a component the ARC SP9 is if it requires at least a month of playing music, and 3-6 hours "warm-up" per listening session, to sound "good," but presumably can't be left on all the time.

**Rob Bertrando**

Reno, NV



## Care Created a Classic: Energy 22 Reference Connoisseur.

What started one day as a passionate desire to produce the world's best loudspeaker ended four years later when Energy passed its final gruelling test.

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When you choose your next speaker system, may we suggest you take the same care. Broaden your musical horizon with Energy 22 Reference Connoisseur. Also available at more modest prices the Energy 22 Pro Monitors and Energy ESM models.

**ENERGY**

No, I really don't genuflect before my first-edition copy of 200 Motels. Fact is, I simply found every one of the releases reviewed in Vol.12 No.1's "Zappalanche" to be better-than-usual Zappa. Digitally remastered versions of all the albums you query are currently available on LP (though only by mail order), and can be found in Box Two of Zappa: The Old Masters, yours for \$100 from Barfko-Swill, Box 5418, N. Hollywood, CA 91616-5418; (818) 786-7546. Reviews of all three Boxes are in the works, and should begin to appear next month.

—RL

## Thiel & satisfaction

Editor:

I am writing this letter to inform *Stereophile* readers that there are still manufacturers in the United States that really do put satisfaction above profits.

I bought a set of Thiel CS2s (serial number 022) and loved them from the beginning. They are quite a revealing speaker, though anything less than the best in front shows up on its output. Reading *Stereophile's* review (Vol.12 No.1) of the latest CS2 showed some improvement in this respect.

I decided to call Thiel and request a price for updating my early model. Thiel called me the next day. They told me they would update my CS2s with a new woofer, crossover, and internal wiring if I paid for the shipping to them.

I shipped them out that same day and they were returned a week later. I am so pleased with this company; I had to write a letter to express my gratitude. I wish all the success to a company who cares so much about its product and customer satisfaction. May all speaker companies be so good.

**Vince Burke**  
Buffalo, NY

## Kimber & satisfaction

Editor:

Just a short note to publicly acknowledge my appreciation to Mr. Ray Kimber of Kimber Kable. About 18 months ago, I purchased 30' of Kimber 4VS speaker cable, and I have subsequently been pleased with it. This past week I bought a new pair of Vandersteen 2Ci speakers, and wanted to bi-wire them in accordance with the instructions in the Operation Manual.

I checked with several local dealers in an attempt to buy another 30' of the 4VS speaker

cable, but no one had it in stock. Thereupon I called Kimber Kable's office in Utah and spoke with Ray Kimber. He took the time to explain that last summer they changed both the wire composition and the insulation material on that type of cable, and the new version might not be fully compatible in a bi-wiring situation with the type I already owned. He then checked his remaining supplies, called me back within five minutes to inform me he had a small amount of the old cable, and offered to send me 30' of it free! The speaker cable was subsequently sent to me gratis, via my local dealer.

What a terrific business gesture, and an outstanding example of one high-end audio manufacturer's commitment to his customers!

**Scott Campbell**  
Tacoma, WA

## Moscodes & satisfaction

Editor:

I wish to support the comments of reader Al Bickoff, who reported on the modifications to his Moscode 300 amp in the February 1989 issue of *Stereophile*.

I similarly had my Moscode 600 amplifier modified by George Kaye of Sound Services of New Rochelle, New York. The modification was a tremendous improvement to the amplifiers as it increased the detail and the depth of the soundstage. At the same time, none of the natural warmth of this amp was lost.

I highly recommend the Kaye modification to those readers who have a Moscode amp.

**Joseph E. Doussard**  
Lakewood, CO

## Mitchell & satisfaction

Editor:

I'd like to extend my kudos for two articles in Vol.12 No.2.

First, Peter Mitchell's discussion of wire and cable is the most sane advice I've read on this subject in the last five years. This whole high-end cable trip is now the least efficacious way of improving your audio system. Peter is the first person I've read who makes some sense out of this mess.

By the way, I thought "Aunt Enid's" attack on Dick Olsher in *The Absolute Sound* (November/December 1988 issue) was pathetic.

The rest of my applause goes to JA and Robin Marshall for an informative look inside the art of loudspeaker design. I wish more designers



# BEAUTIFUL MUSIC IS ONLY SKIN DEEP

"Skin effect" is a phenomenon which causes discontinuities in the behavior of electrical current as it flows thru the core and outer skin of an audio conductor.

This effect causes much of the distortion, poor imaging and poor dynamic contrast in most conventional speaker cables.

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Audition LiveWire Black at your nearest Audioquest dealer and he'll show you how to keep your music skin deep and beautiful.

**aq**  
audioquest



had Robin's down-to-earth attitude toward hi-fi.

Looking forward to next month's issue. Mahalo.

**Dan Evert**  
Pukalani, HI

PS: Please do yourself a favor and take a listen to MFA's tube electronics (Luminescence Pre-amp & M-120/200 amps). Put on your best Fender bass record and get down. . . excuse me, ask yourself—"Am I enjoying this?"

## Good news, bad news

Editor:

Some good news and some bad news. Good news first: My compliments on Peter Mitchell's rational views on interconnects and speaker cables in the February issue.

I have for several years previously used exactly the same rig as Peter describes: a 20' run of Canare mic cable from my CD player to my amps, with the shield grounded at the source end.

This arrangement did not completely eliminate RF from gypsy radio cabs, operating with 10W-and-up illegal linear transmitters. (I get them on my telephone, too.)

I recently replaced the mic cable with coax instrumentation cable, specified by NHK for transmitting High-Definition video signals. This stuff has a bandwidth of 50MHz, and makes a lucid alternative to hyper-expensive audio interconnects. Not yet sold in high-end audio emporia or video stores, though.

The new cable hasn't completely removed the RF breakthrough. But it has knocked it down in level. And the improvement in audio resolution has made the substitution well worthwhile.

Now, for the bad news:

In passing Lyric Hi-Fi's Broadway store, I spotted the latest *Stereophile* in the window. I no longer subscribe because of New York's Third-World Postal Service: copies either do not arrive at all, or they're delivered in such a shredded condition as to be unreadable. Anyhow, I popped into Lyric. And was greeted with a withering "May I help you?"—delivered in a tone that implied I was one of New York's Homeless looking for a handout.

When I said: "*Stereophile*," the salesman replied: "Oh, *that* rag." (He did condescend to have his assistant sell me a copy, though.)

What gives? If Lyric disapproves of *Stereophile*, why put it in the window? And adver-

tise in your pages? If this is just the salesman's personal opinion, I didn't ask for it—just a copy, thank you. *Sans* editorial comment.

As a buyer and user of over \$200,000 worth of high-end and pro audio gear since the 1950s, I can hardly express my resentment toward this supercilious attitude. Needless to say, Lyric is *not* my high-end audio dealer of choice.

Anyhow. . . I'll keep on buying and enjoying *Stereophile*. Somewhere else. Keep up the good work!

**W. A. Grieve-Smith**  
New York, NY

## The GAS revival

Editor:

This should come under the heading of "Setting the Record Straight," or "Reports of the Company's Death have *not* been exaggerated."

Recently, an ad appeared in several publications indicating that Great American Sound (aka GAS Company) is back, implying that the originators of the company, and those responsible for the design of its products, are back with it ("... despite evidence to the contrary, *we* never really left..."). As one of the two originator/founders of GAS Company, I wish to state that it just isn't so; "we" are *not* back.

I am not referring to Mike Bettinger's Gasworks; Mike was a factory-authorized service center when GAS Company was in business. I think the fact that he has chosen to support the owners of GAS products with his service is commendable. I have spoken with him many times over the years and highly recommend his services.

However, another ad has been run, indicating that GAS Company itself has returned. There was also representation by a group of individuals at the Winter CES indicating that they had purchased GAS Company from its previous owners. No such sale/purchase has been made.

In 1974, following the success of Danny Meyers's Southwest Technical Products Tiger amplifier kit, James Bongiorno and I put together an amplifier to be sold as a kit. The following year, Jim designed a prototype of that amplifier and arranged for it to be presented as a construction article in *Popular Electronics*. Arthur P. Salsberg, then Editorial Director of *Popular Electronics*, gave the amplifier its name—Ampzilla—and the company began. Discussions of a formal company were soon under way, and one evening, at a restaurant, in

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a meeting with attorneys to form the company, I named the company "Great American Sound." The next day, I created the abbreviation "G.A.S. Company."

I will not take the time or space here to completely reconstruct the history of our company; perhaps I will do that in the near future for those who might be interested in knowing how GAS Company evolved and what finally really happened to it and its players. But for the sake of brevity, I will simply state that in the years that followed, the line of GAS products expanded, as did the size of the company and the number of employees. Jim designed the Ampzilla, Ampzilla II, and the original Thaedra. I designed the Thoebe, Thalia, Thaedra II, Son of Ampzilla, Godzilla, GAS 500, GAS 240, and GAS 120.

Because my expertise and interest was only in the design aspect of the company's products, my primary function (and title) was Vice President of Engineering. Jim was the President of the company and was the main force behind our sales and marketing activity. It was a good match for as long as it worked. Early in 1977 Jim left the company after a falling out with the owners, which by then had evolved to five people, of which I was one. In 1980, GAS Company went out of business because of a variety of problems. However, to put it simply, the company experienced too much growth too fast with too little cash flow. The economy at that time was disastrous for small, growing companies such as ours. The bank foreclosed, and GAS Company doors closed. It was a time of terrible pain and disappointment for all who were involved with and loved the company. However, I think to this day that nobody loved that company and all that it meant to the industry and to its clients more than I. Nobody experienced the pain of that loss more than I. I still do.

It is because of that love and respect for my own work, and all that GAS Company meant to me and to so many people, that I am writing this letter of disavowal of any involvement with the new "GAS Company," whoever they may be. I know that Jim Bongiorno is not involved with that company either. I am proud to have been associated with the products I designed, as well as with those designed by Jim, and I stand behind them with pride. If this new company utilizes the names we gave those products, I do not know what the products will be,

but they will have nothing to do with me. Furthermore, to my knowledge, they have not purchased GAS Company, or the right to use its name, or the names of any of its products.

At this Winter's CES, several people came up to me to ask me about the "new" GAS Company, assuming that I was part of the group advertising and handing out business cards. Those inquiries prompted this letter. For those who asked about me personally, I worked as an electronics engineer in the aerospace industry for a number of years. I now work as a Senior Design Engineer for a large manufacturer (and innovator in the industry) of audio equipment. I started a small business of my own a few years ago, called P.I.E. (Precision Innovative Electronics), for which I design and build custom items (2.2kW amps for the Grateful Dead, among others). I will not be resurrecting GAS Company products; but I am immensely proud of their design and contribution to this industry.

Thank you for this opportunity to set the record straight.

**Andy Hefley**  
Oxnard, CA

*We sent a copy of Mr. Hefley's letter to Califone, the parent company of Sumo, who have acquired the rights to use the GAS brandname. Their response appears in this issue's "Manufacturers' Comments" section.* —JA

## Rappaport help?

Editor:

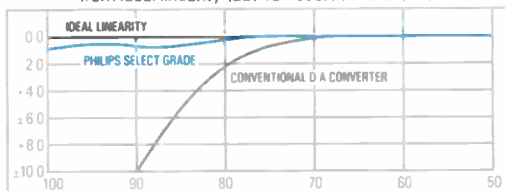
In 1977 I purchased a Rappaport PRE-1A preamplifier. Recently, however, the level on its right channel dropped drastically, and I have not been able to find any service repair center in my area who will repair it. I know that Andy Rappaport has been out of business for quite some time now, but there must be *someone* who does repair work on Rappaport equipment. In the event that I cannot find a repair center, I have purchased an Adcom GFP-555 preamplifier. I found *Stereophile's* review on this unit quite impressive. I was able to audition one in my area and found it to be an excellent preamp. Without being able to A/B the two units, I am not able to critically compare the two. Initially I tend to think that the Rappaport is more transparent and alive.

Any information you can give me will be greatly appreciated.

**Nicholas J. Brescia, Jr.**  
Utica, NY



Philips superiority is clear, from this graph showing deviation from ideal linearity (dB) vs. recorded level (dB).



The heart of the CD960 is the Philips dual 16-bit D/A converter chip, the TD-1541 select version. So refined it flawlessly reproduces even the quietest passages with a clarity never before achieved. This exceptional D/A converter is mated to a Philips 4X oversampling digital filter for superior performance. Philips pioneered 4X oversampling and our experience with digital filtering is unequalled.

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- Broadcast standard "Radialinear" transport. Philips commitment to exacting specifications is also evident in the CD960's mechanical construction. It features a high-grade cast alloy chassis. A linear-design motor was chosen to drive the radial pivoting arm for fast track access and exceptional resistance to external vibrations.

- Multiple power supplies. To eliminate cross talk, the CD960 incorporates no less than four separate power supply sections. And the 100-watt main transformer is partitioned to further shield against magnetic and power line interference.

From the company that created the compact disc, Philips proudly offers the CD960 for those who won't tolerate anything less than perfection. To audition the CD960, call 1-800-223-7772 for your nearest Philips audio specialist.

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# UPDATE

## USA: Peter W. Mitchell

Among businessmen and bureaucrats, the age of 60 is an occasion for thinking about retirement and Social Security. But a 60-year-old symphony conductor is in the prime of his career, and many continue conducting well into their 80s. Why are conductors such a long-lived breed? Perhaps it has something to do with the amount of upper-body aerobic exercise they get—all that arm-waving and deep breathing. In televised concerts the view of the conductor, drenched in perspiration as he beats out the tempo of a symphony's triumphant final bars, has become a visual cliché.

We who listen to music are more sedentary. Usually our exercise amounts to no more than a bit of discreet toe-tapping. But not always: who among us has never acceded to the temptation to stand in front of the speakers and conduct the phantom orchestra? No matter what type of music you enjoy, it can be immensely satisfying to respond to its harmonic and rhythmic modulations with the body as well as the brain. Implausible as it may seem, this applies not only to rock, big-band jazz, and big symphonies, but also to chamber music. I defy anyone to remain motionless during the gypsy dance in the last movement of Brahms's G-minor Piano Quartet.

Happily, assistance is at hand for living-room conductors. The North American School of the Artsy and Somewhat Musically Inclined sells its Complete Conductor Kit (item F-002) for \$16.95 plus tax and shipping. It includes everything you need to conduct at home: a genuine white-enameled cork-grip baton, humorous but accurate instructions, a paper-cutout orchestra, and a cassette tape of eminently conductable baroque music. The deluxe version (item F-003, \$19.95) includes a conducting diploma (Magna Cum Loud) inscribed with your name. The baton is also available separately (F-001, \$5.95 plus tax and shipping).

I considered publishing this story in last month's issue, but it's for real, not an April Fool joke. The kit was devised by Nicholas Nash, a teacher and public-radio programmer who believes that serious music is also fun. His mail-order "school" sells basic books about music

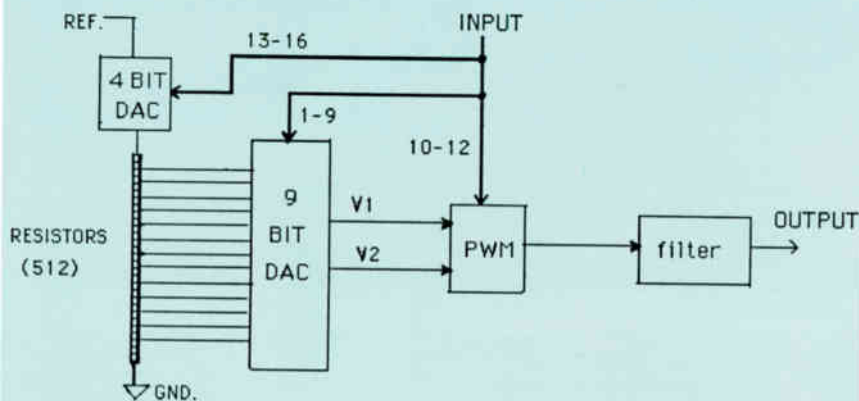


Fig. 1

DECODER ANATOMY

and conducting, simple instruments (including a party kit of kazoos, slide whistles, nose flutes, and ocarina), and musical scores (which can be rewarding to study even if you have no formal training in reading music). Call (800) 888-1220 to place a credit-card order, or write to P.O. Box 10931, White Bear Lake, MN 55110 for more information.

### The silver disc marches on . . .

According to CBS/Sony, Japan's largest record manufacturer, CDs now outsell vinyl discs nine to one, so the company is phasing out LP pressing operations in the home country.

### A linear low-cost DAC

In earlier issues (July and October 1988) this column has discussed the widespread problem of poor low-level linearity in CD players. In addition to compressing or expanding low-level dynamics, this error causes crossover distortion—a kink in the waveform whenever it crosses the zero axis. The problem is not unique to CD players; it also arises in outboard digital-to-analog converters (DACs) and in the playback sections of some DAT recorders.

The difficulty arises from the dynamic range of 16-bit PCM. In most DACs the analog signal is formed by summing 16 currents (one for each bit), each half as large as the next. Since the MSB (most significant bit) contributes 32,768 times more current than the 16th bit, extraordinary precision is required for correct low-level decoding.<sup>1</sup>

The error can be minimized by using 18-bit, 20-bit, level-shifted, or dual push-pull DACs; by testing every DAC chip and selecting only the most linear ones; and by individually finetuning the MSB current of each DAC on the production line. Of course, these steps add a few dollars to the manufacturing cost of a CD player, but that's not an obstacle in high-end models. If manufacturers thought it was important, good linearity could be routinely achieved in every CD player (or outboard decoder or DAT) priced above a few hundred dollars. But what about cheaper players?

According to the industry-standard 4:1 rule, a \$400 product must cost less than \$100 to manufacture, and poor linearity has been endemic in low-cost players. But a new DAC from Sanyo promises to eliminate the connection between linearity and cost, allowing the cheapest CD players to be as linear as the best models. The Sanyo LC7881 decoder does not work by linear current-summing. Instead, it divides the CD's 16-bit code into three parts that are handled separately by a 9-bit DAC, a pulse-width modulation stage, and a 4-bit DAC. The accompanying illustration (fig. 1), which I have simplified for clarity, illustrates the operation of the decoder.

A reference voltage is divided into 512 equal steps by a string of 512 resistors (2 to the 9th power). The 9-bit DAC is an electronic switch

<sup>1</sup> See also Peter van Willenswaard's report from Holland in this issue. —JA

# The McIntosh XRT 22 Loudspeaker System delivers

The McIntosh XRT 22 is the purest expression of the loudspeakers scientist's endeavors. It is the one *right combination* of component parts that has eluded the diligent searcher for the loudspeaker bridge to the dominion of reproduced musical reality. The high-frequency radiator column is an illustration of the *right combination*. The 23 tweeter elements can reproduce 300 watts sine wave input power at 20 kHz, with the lowest measured intermodulation distortion. Because each tweeter mechanism handles a small quantity of the total power, extremely low quantities of distortion are developed. The total column radiates the energy in a half cylindrical time co-ordinated sound field. The low distortion, transparency of sound, coherence of sound images, definition of musical instruments, and musical balance is simply a revelation that you must experience.

Extra Realism  
Extra Depth  
Extra Spaciousness  
Extra Smoothness



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whose setting is controlled by bits 1 to 9. By making a connection to the top and bottom of one of the 512 resistors, it picks off voltages V1 and V2 that are slightly above and below the voltage described by the 9-bit code. The PWM (pulse-width modulation) circuit alternates between V1 and V2 at a 1MHz rate. Code bits 10-12 determine the percentage of time that the circuit stays at the higher voltage, so that after the 1MHz oscillations are averaged by filtering, the output voltage correctly represents the first 12 bits of the code. Meanwhile, the 4-bit DAC has responded to bits 13-16 by switching small resistances in and out, biasing the voltages in the resistance string slightly up or down, so that the output correctly represents the full 16-bit code.

This looks like a complicated arrangement, but since the 9-bit DAC requires an internal precision of only one part in 512 (instead of one in 32,768), the IC is cheap to manufacture. It is also cheap to use. It needs no current-to-voltage converter (a significant source of distortion in conventional designs). Its PWM output stage needs no "de-glitching" circuit to remove switching artifacts from the staircase waveform. The IC contains dual decoders that handle left and right channels simultaneously, avoiding interchannel phase shift, and it can be used with a 4x-over-reading digital filter for phase-linear playback. Finally, it is a low-power CMOS IC, suitable for portable players.

Reportedly the decoding of the Sanyo LC7881 is inherently linear within 1dB down to -90dB, equalling the best and most expensive converters on the market, with no need for costly hand-trimming. So could this IC be the basis of a high-end player at a bargain price? Maybe. But it's not perfect. At medium-low signal levels around -70dB its measured distortion is twice as high as that of a conventional decoder, evidently because of poor *differential* linearity. (Explanation, using hypothetical numbers: if digital codes representing -66dB and -70dB generate output levels of -67 and -69, absolute linearity is good within 1dB, but differential linearity is poor because a 4dB input difference produced only a 2dB output change.)

In the September 1988 issue of the *Journal of the AES*, N.H.C. Gilchrist of the BBC Research Department described listening tests in which nonlinearities were deliberately introduced into digital playback of several piano

recordings. Decoding errors at the zero-crossing axis produced gritty distortion that was easily heard, even when the nonlinearity was slight. But as the discontinuity was moved away from the zero-crossing axis, it became progressively more difficult to hear. So, while the Sanyo converter's distortion at medium-low signal levels doesn't look good on paper, it may be much less audible in music than the crossover distortion produced by a conventional DAC.

The Sanyo decoder is available to any manufacturer who wants to use it, so it could turn up in many budget-priced players. How good they sound will depend, of course, on the quality of the analog output circuit, power-supply regulation, and other factors, as well as on the performance of the decoder.



**Arcam's Black Box, one of a growing number of outboard D/A converters**

## **UK: Ken Kessler**

GEC, Plessey, and the other British electronics giants (non-hi-fi division) aside, it's doubtful that the UK will ever again be the home of a billion-pound audio-producing corporation. The days when companies like Garrard and BSR owned whole markets are long gone. To be fair, though, few countries can boast of native audio-producing concerns which rival the Japanese for size. Philips, Thompson—there are some non-Japanese hi-fi giants, but not many.

You'd think the UK would therefore rank as

a sort of "third world" territory, but that's an invalid tag because the Third World actually houses many of the factories which feed the Japanese majors. Our biggest companies are minuscule by international standards, but it's to their undeniable credit that British manufacturers remain so influential despite the lack of serious economic clout. Now, to add to the impact that the UK specialists have had on hi-fi culture (even the Japanese giants now offer performance-oriented speaker stands), at least one British company is breaking new ground in manufacturing techniques.

Surely this is the preserve of the already-robotized Japanese hi-fi industry? Well, yes—but that doesn't explain why proud-to-be-Scottish Linn Products has been playing host to a flood of foreign visitors keen to examine their new, state-of-the-art factory in Glasgow.

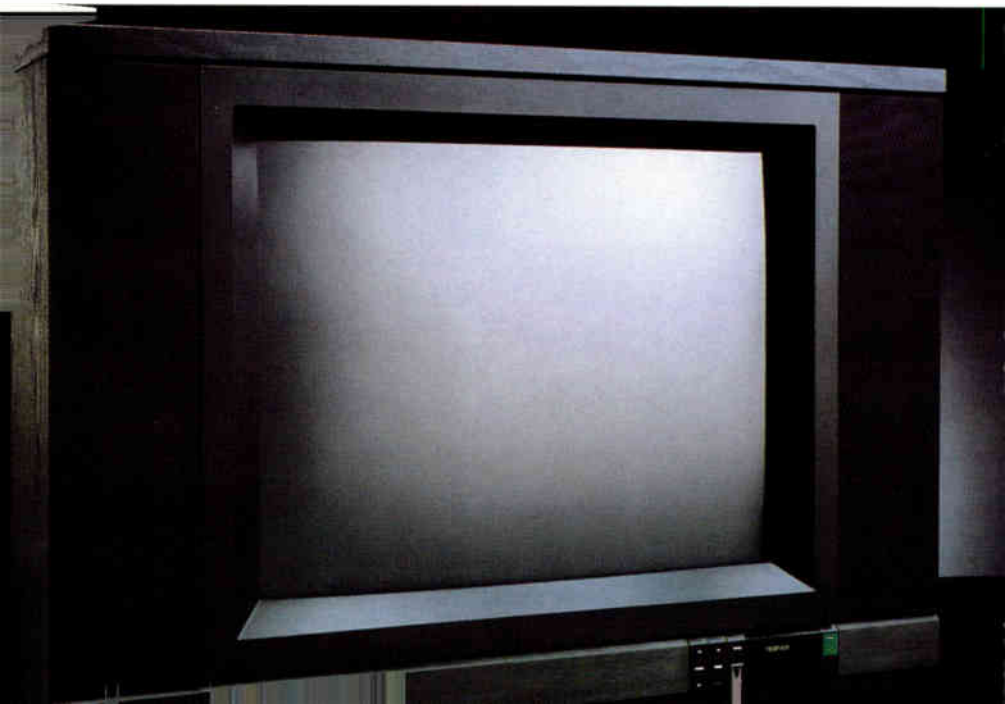
Think about it: Linn is a company which made its name and most of its money from a turntable—hardly the product with which to welcome the 21st century. It is a smallish company; by that I mean well out of the cottage industry league, but not yet as big as Bose or Polk, for example. Linn prides itself on personal service, close relationships with its dealers, and

iconoclastic behavior, including an ad campaign which suggests that its founder is certifiably mad. With decidedly non-mass-market products and a corporate (behavioral) profile which would drive an IBM or McDonald's personnel officer up the wall, Linn does not look like it could be that much of a pacesetter outside of the high-end community.

Whatever way you look at it, Linn is a specialist manufacturer hardly likely to serve as a role model for companies which spend more on their reps' parking fines in a year than Linn grosses. But their new factory is something else, something so Spielbergian that I'm even tempted to make a visit to see it firsthand.

I visited Linn's original factory a few years back, when the site of the current showpiece was just an empty field. The old Linn factory was straight out of Mervyn Peake, a cluttered hive that expanded as needs required in the old manner: add on an extension, squeeze in another machine. For the new factory, Ivor Tiefenbrun built in, among other things, a growth factor: Linn works should never again resemble a hairshirt operation whatever the scale.

The factory was designed by Richard Rogers and Partners, the same team responsible for the



controversial Pompidou Centre in Paris and the radical, loved/loathed Lloyds Building in London. What makes the Linn factory such a stand-out site is that it's purpose-built to incorporate the latest (and whatever the future will offer) in computer-integrated manufacturing. Linn has been computer-oriented for years, having installed multi-user on-line computing over a decade ago and used CAD-CAM/CNC techniques long before they were fashionable. (The company also as a successful division developing computer hardware—see *Byte*, December 1988.) The new concept makes the building itself a key part of the computer operation.

Having decided early on that Henry Ford-style assembly lines did not suit the company's needs, Linn adopted the single-station build techniques used by companies like Volvo, where one person assembles an entire product from parts through to final packing. This in itself is not a new idea; what the new factory provides is a method for removing all manner of logistics problems. A central computer controls all movement of parts from a single automated warehouse, enabling Linn staff to order a part and receive it via automated guide vehicles within 10 minutes of making the request.

(Conventional systems require anything from two to six hours for the same task.) This technology also applies to materials as well as parts, and finished products are handled in the same way. The factory layout is such that paths and distances from the various zones are as short as possible, and the inherent flexibility of the factory means that any part of the plant can be used for any procedure, be it manufacturing, testing, or shipping. Furthermore, the production areas were conceived for easy changeover from product to product, with the automated vehicles not only supplying the parts for the job but the workstation tools as well.

Has it paid off? It will be some time before Linn ameliorates the huge investment—some £5 million (\$9m) for the factory against a current turnover of around £8 million per annum—but the kudos have already been received. Earlier this year Linn's factory won the cherished Royal Institution of British Architects' 1988 National Award for Architecture. *Management Today* magazine nominated Linn Products as one of only six world-class manufacturing facilities in the UK, and there have been other honors from Europe and Japan. Just about the only disappointment in Linn's eyes

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is the failure of the British government or the architecturally concerned Prince of Wales to bother visiting the site. Not that I think the anarchic Ivor Tiefenbrun is losing much sleep over that.

Another area where UK specialist manufacturers are doing more than their fair share of innovating involves digital technology, despite the image that UK brands have for turntable mania. While non-UK makes like Wadia, Krell, and Theta are leading the charge for high-end outboard digital processors, the more populist British manufacturers are—wisely—offering the benefits to those who need them most. Think about it: the kinds of CD players accessible to the people who can afford Wadias and Thetas are less in need of sonic tonics than the players which proliferate in the real world.

What does the audiophile-on-a-budget do when he or she wants an upgrade? Buy a Wadia? Hardly. But maybe that buyer can stretch to another £300 or £400, and that will probably only replace an existing player with one which is not a whole lot better. The concept of high-grade, outboard D/A converters is perfect for the budget audiophile sector, because it means a worthwhile improvement at a sensible price.

The arguments, however basic, have been proven in the UK by near-unanimous acclaim. I can't think of any budget CD players which didn't benefit from the addition of an outboard processor. Although the market may be small—how many non-enthusiast owners of inexpensive CD players even know what a D/A converter is?—it's big enough to make it all worthwhile for the handful of manufacturers who were sharp enough to identify the niche.

At the moment, there are two primary makers with a third in the wings, and there are rumors of others to follow. (Ironically, the ones I've heard about for possible release in the next 18 months are high-end units to compete with the Wadia, Theta, and Krell.) The third "in the wings" is the previously announced outboard unit from Cambridge Audio, but the company is currently undergoing a change of ownership which has delayed its release. I'm betting that they'll have it ready for either the Hi-Fi Show in September at the Heathrow Penta Hotel, or perhaps for CES—June or January, take your pick. Until then, the field belongs to Musical Fidelity and A&R Cambridge (British Fidelity and Arcam in the US, respectively).

Since both have had competing machines available for some months—Musical Fidelity with the Digilog and A&R with the Black Box—camps have already been formed, which means that it's time to up the ante. First off is A&R, who started the whole thing anyway, with their Black Box 2. The original CD-only Black Box remains in production at £250, but for another £50 you get a model better suited to the latest generation of players, DAT, and (this should shake 'em up in Studioland) the AES/EBU format signals used in recording. (The module can also be added to existing Black Boxes.)

The Black Box 2 contains a new input module which is equipped to accept both coaxial and optical inputs, the latter using the industry-standard Toshiba Toslink optical connector. (The system defaults to the optical input when fed both signals simultaneously.) This module contains the necessary circuitry for operation at both 44.1kHz and 48kHz sampling frequencies, selected automatically according to the source. A&R even includes 0.75m of Toslink terminated optical fiber and OFC copper coaxial link cables in the price. In other respects it's similar to the original Black Box.

I'm not suggesting that there's a mad rush to outboard converters, but A&R had done its homework. The company has identified over 100 current and discontinued models available in the UK with digital outputs, but it must be pointed out that many of these are serious machines (eg, the better Marantz and Sony players and most of the high-end machines) which probably have such good onboard circuitry that the Black Box will have little effect on performance. But whatever way the market goes, at least some companies are offering a valid alternative to annual or biennial model changes.

It's worth noting that although the UK is taking the lead in making CD acceptable to budget-minded tweekers, the UK as a whole remains the one market most resistant to CD. The latest truly complete figures for software sales (1987) have just been released, and they make for interesting reading. The British bought 18.2m CDs in 1987 compared to 52.2m LPs. Although the 1988 quantities are only preliminary figures, it looks like the LP is holding on with greater tenacity than expected at 49.6m, while CD sales climbed to 27.5m. In the USA, CD unit sales are said to have surpassed

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**For Those Who Care  
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LP—it was already close in '87 with 102.1m CDs vs 107.0m LPs, while in Japan the LP was knocked into third place behind CD and cassette a couple of years back. But with EMI recently announcing that it will be ceasing (classical) LP manufacture for all but the most popular artists and with the CD single proving to be a most desirable commodity, the attack on vinyl playback continues. How long will the LP (and the 7" single) survive in the UK?

Longer than anywhere else, I'll wager.

## The Netherlands: Peter van Willenswaard

1989 may well become the year of the D/A converter (DAC). CD-player manufacturers have, almost without exception, launched research projects focusing on this problem area of digital audio; many of these projects are already a year old. This is, however, by no means the only imperfection keeping us away from the high-quality sound we have come to suspect is possible with digital audio media, and maybe not even the most important. There are other factors: jitter, for instance, not an amplitude- but a time-related defect in the digital data stream or in the clock signals controlling the proper functioning of the decoder, digital filter, and converter circuits. It can be shown that jitter will demodulate as a function of the momentary steepness of the converted audio signal, which will cause very low-level but very awkward distortions. Then there is the choice of the digital low-pass filter. To think you're out of the minefield once you have decided to stay away from the various types of high-order analog filters and instead include a digital filter in the design of a CD player, is a misconception: there are about as many different digital filter configurations as there are analog ones! Moreover, I would not at all be surprised if two identical digital filter configurations of different manufacture sounded different. Until now, relatively little work has been done to investigate the relationship between configuration and sound.

Besides these and other known points, there are almost certainly a couple of problem areas we haven't come across yet. One can be equally sure that this new technology still hides from us an interesting collection of as yet unthought-of possibilities.

## Zero-crossing distortion

In view of what I'll be saying in the rest of this article, it is essential that the reader have a precise understanding of the zero-crossing problem of the standard DAC, so I will discuss it first extensively. If you know already, you can skip this paragraph.

The easiest way is to start at the beginning. What would be an ideal way to convert an analog signal into a digital one? The first step would be to cut the waveform into 44,100 samples per second.<sup>2</sup> Then we would like to know if the amplitude in a given sample of the signal were positive or negative; that information would be stored in the first bit, a 1 for positive or a 0 for negative; we'll call it our sign-bit. Next we would see if the absolute value of the investigated amplitude (disregarding whether it is positive or negative) is larger or smaller than our largest magnitude-bit; if so, this bit will be set to 1; if not, it will remain 0. Our digital word is now two bits long, and in the case of a large positive value it will read 11. Next we will try the sum of the largest magnitude-bit and the second-largest magnitude-bit; if our sample is larger still, the second bit will be set to 1 too; if not, it will be 0. Let us suppose our sample is larger than the largest magnitude-bit but not as large as the first two together, and thus add a 0 to our digital word, which becomes 110. Now if we continue to try to determine whether the next (smaller) bit should be on or off, and the next (even smaller), and so on, we will zoom in with more and more precision on the exact value of the sample. And, while doing so, our digital word will grow until we have determined the 15th magnitude-bit: one sign-bit plus 15 magnitude-bits makes 16 bits (the limit given by the generally adopted digital audio standard).

For low-level signals this sign-absolute-magnitude-system has a friendly character. The first bit only indicates + or -, the next 10 bits or so remain stable at 0, and only the smallest bits will change value from one sample to the next. There is no great difference of ratio between these small bits, so temperature drift is no problem and there won't be any nasty glitches (narrow but pretty high pulses between the samples, of digital origin) where we

<sup>2</sup> Since we're starting all over again, I'm tempted to also adopt a higher sampling rate, but I won't; it's simply not the issue here.



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least want them: in the softest part of a musical signal.<sup>3</sup>

So why aren't real-world A/D and D/A converters built like this? For two reasons. One is that digital circuitry cannot easily perform arithmetic operations with sign-and-magnitude-coded signals. The other is that A/D and D/A converters, developed for measurement purposes, already exist. Now in many measurement applications the value to be measured is either a positive or a negative one, rarely one alternating around 0V. So A/D and D/A converters were designed to operate single-sided, the digital codes starting 000...000 for the zero value and counting their way up to the maximum 111...111 to describe their largest sample value.<sup>4</sup> In audio we have *nothing but* alternating signals, so if we want to use the existing digital technology, we shall have to define an artificial zero line somewhere in the operational window offered by the A/D or D/A converter of our choice. The most logical place to put that artificial zero is in the middle of that window, halfway between 000...000 and 111...111, the converter's minimum and maximum values. Which is what Sony and Philips did. Halfway is where the largest bit (Most Significant Bit, or MSB) must come into action if the DAC's output voltage is to grow any further. For audio either 011...111 or 100...000 had to be defined as "digital zero."

In fact, the coding used still uses the MSB to indicate the sign of the signal, 1 for negative and 0 for positive, thus 100...000 is the lowest value and 011...111 the highest. The two choices for digital zero therefore become 111...111 and 000...000.

Now let's take a look at what will happen around digital zero, which we will assume to be 000...000. One step up the digital staircase poses no problem: 000...001: the Least Significant Bit (LSB) is switched on. One such tiny step down, however, changes the world: 111...111. *All bits change value at the same time.* This causes glitches (because the bits usually don't switch in exact synchronization) and possibly other kinds of "digital noise." The second observation to be made is: the difference

between the voltage 000...000 generated at the converter output, and the voltage corresponding to 111...111, must be exactly one smallest bit (1 LSB), one step down the staircase. It usually isn't. If the error here is greater than 0.5 LSB, the converter is no longer monotonic. That is, at this point the staircase doesn't look like a staircase any more. This causes severe distortions at low signal levels (and dither doesn't help!). In practice, errors of 1 LSB are found to be quite common, and errors of several LSBs are not exceptional.

Why is it so difficult to make D/A converters perfectly monotonic? I'll repeat what I said a little earlier: the difference between the voltage 000...000 generated at the converter output and the voltage corresponding to 111...111 must be exactly one smallest bit, 1 LSB. The MSB must therefore be exactly one bit greater than the sum of all the other bits together (011...111). The ratio between the MSB and the LSB is  $2^{15}$ , in decimal language 32,678. If we tolerate 0.5 LSB error, the precision of the MSB must be within  $0.5/32,768 = 0.000015$ , or 0.0015% regardless of temperature and power-supply voltage changes. And that is a serious problem! Ever try to cut a bar to a 1-meter length within 0.015mm? Such a tolerance is hard to realize in serial manufacturing. That's why you'll find a trim pot next to the D/A converter in so many CD players. But that doesn't ban temperature drift: trim it to be optimal today, and tomorrow it may be off by 1 LSB or more.

## Developments

It is remarkable that it took so long for the zero-crossing distortion (also called MSB error) to be widely recognized as a real problem.

On the other hand, it was one of the reasons Philips had wanted no more than 14-bit encoding. Sony demanded 16 bits for the CD standard (thank goodness), so Philips had to do something about the remaining two-bit gap, and invented 4x-oversampling (thank goodness again). Then the matter seemed to go into hibernation, perhaps because it took reviewers years to figure out what exactly was going on inside CD players.<sup>5</sup> And it surely helped when the CBS CD-1 test disc became available in 1987.

Now I want to take a look at what's happen-

<sup>3</sup> There is one small problem: we have *two* digital codes for 0V instead of one: a rather naive endeavor to define plus-zero and minus-zero; it makes this system a little less straightforward, but let's stick to the main issues.

<sup>4</sup> Again, reality is slightly different, but as it has no principal implications, I avoid this potentially confusing issue.

<sup>5</sup> Or they just weren't interested, because of the disappointing sound of the first generation of CD players. I made that mistake.

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ing at the D/A-conversion front lines. In measurement technology, developments are incredibly fast; they seem to invent a new or faster way of D/A conversion every week. That in itself is quite promising for the future of digital audio. But in present digital audio we can distinguish three trends. There are some overlaps in the newly chosen technologies between the various manufacturers, so be careful not to pin them down as soon as one of their names appears in one category.

**More bits?** This trend is found with the majority of the Japanese manufacturers. Not really surprising, as they have always aimed at increasingly better-looking specifications. Early in 1988 we got a number of 18-biters, and in the fall Denon and Accuphase introduced 20-biters. This suggests that the MSB problem in the 16-biters is under control, but that is not at all the case.<sup>6</sup> It only means that the LSI industry has succeeded in putting more bits onto a converter chip. If you look at the data sheets of these converters, you'll find that most of them specify monotonicity only up to 15 or 16 bits. Not bad for 16-bit audio, but in flagrant conflict with the 18-bit banner. Let us repeat the above calculation of the required tolerances for the MSB value. The LSB in an 18-bit system is four times smaller than with 16 bits. Hence  $0.0015/4 = 0.0004\%$ . Take a bar and try to cut a length of 1 meter with 0.004mm or 4 $\mu$ m precision. Suppose you succeed; the moment you touch it, it will be out of spec because of the warmth of your hand. So to make a true 18-bit converter (monotonic from the start and remaining so over a reasonable temperature range) is very, very difficult.

A true 20-bit converter is almost a physical impossibility. Accuphase didn't have to worry about price but it is no wonder Denon decided to use an 18-bit converter and add a few discrete transistors to have an input for bits 19 and 20, and feed the output signals to a summing amp. The LSB here is again four times smaller than in the 18-bit case, so an MSB tolerance of 0.0001% follows. When physicians define super-small deviations, they speak in parts-per-million (ppm). The calculated 0.0001% is one ppm. Reference currents inside D/A con-

verters are in one way or another set by one (or more) resistor(s). A very low-temperature coefficient resistor can be found in a good-quality metal-film resistor. The temp.coeff. of such a resistor is 1 ppm/ $^{\circ}$ C. Are these converters in a constant-temperature oven? (And we haven't even spoken of semiconductor drift yet!)

Perfectionists who unknowingly demand a minimum of, say, 24 bits for good audio should take notice. I know who I am talking to; I used to be one of them.

Now, are these higher numbers than 16 bits therefore useless? No, not quite. The rounding-off process in the digital filter can be performed at a lower level, and that can be an advantage. And smaller vertical steps in the output staircase<sup>7</sup> are a welcome move closer to a stepless analog signal. But more bits do not (given the technological boundaries of our day) present a solution to zero-crossing distortion.

### 16 bits improved: Philips/Marantz

There are, however, a few solutions for arriving at a better zero-crossing behavior without opting for a totally new conversion technology. Good old Philips found one. They were forced to, mind you, because their original SAA7220/TDA1541 filter/converter combination showed large zero-crossing errors, and a lot of difference between channels. But they didn't go for the Burr-Brown solution of adding an adjustment pin to the converter chip, prescribing the use of an external trim pot, and praying for constant temperature. When they announced their new SAA7220P/B digital filter and TDA1541A converter, I didn't immediately understand what exactly had changed. Until I did a test of the new (and beautiful-sounding!) Marantz CD12/CDA12 CD-drive/DA-converter set, which is marketed in the US under the Philips name.<sup>8</sup> In the accompanying literature a digital DC offset was mentioned as a cure for zero-crossing distortion. The zero-level had been shifted, it said, to a -63dB level. Some research made it clear that the SAA7220P/B is doing just that. The CDA12 happens to be an early user of this new digital filter, but others are to follow.

<sup>7</sup> I must note here that I have never been able to display on an oscilloscope screen the smaller steps promised by an 18- or 20-bit conversion. One explanation would be that the test signals on the various test CDs I use are too simple and bluntly impose 16-bit steps. Another is that today's digital filters aren't yet smart enough in their calculations.

<sup>8</sup> As the Philips LHH1000.

<sup>6</sup> To be honest, a number of 18-bit converters actually are slightly better than the last generation of 16-biters. Slightly better on a 16-bit scale, that is.

So how does 7220/B do it? It adds a small binary number to all the digital words before they leave the filter. In this small binary number, all bits are zero but for the 11th: 000000000100000. Thus, the code that was "digital zero" (the MSB turnover point) is shifted to a level slightly higher than the D/A converter's zero-crossing point. The distortion caused by the MSB error of the converter now happens at a -63dB signal level where it will be masked by the relatively strong signal. The *signal-zero* transition is now from 100000000011111 to 1000000000100000, so only the last six bits change value here, which is far less harmful than all bits changing at once (including the most difficult, the MSB).<sup>9</sup> Philips also narrowed production tolerances on the 1541A converter and selects them: there is a better 1541A S version, an S1 version, and an S1 Crown version, the top selection. The CDA12 is using one of those. Both SAA7220P/B and selected TDA1541A can be ordered from Philips; their combined cost is just under \$100. If you consider upgrading and your older chips are not mounted on IC sockets, think again and don't. Print tracks are very thin and very likely to be irreparably damaged when trying to desolder the existing chips.

I would also like to note here that it isn't just these new chips that place the Marantz CD12/CDA12 among the world's top three CD players (yes, it's that good, in my opinion). It contains a very sophisticated de-jitter circuit. Taking one look inside and trying to lift one (if you have a chance) will tell you the rest.

### 16 bits improved: Technics/Panasonic

Technics has come up with a clever one too. They call it 4-DAC, meaning two DACs per channel. Of course Technics is not the only one to use two converters in tandem, but they've done something special. They designed a new processing chip to be inserted between the digital filter and the converters. This chip has two outputs, each feeding one converter. Inside the chip the (digital) signal is split into the positive and negative signal halves. These halves are then each converted by their own DAC, and the DAC outputs are summed with an op-amp.

<sup>9</sup> The situation is slightly more complicated. A 0dB signal will (digitally) clip on one side because of the (digital) DC shift, if no further measures are taken. The SAA7220P/B therefore also down-scales all signals by a small factor to enable a distortion-free 0dB. Consequently, a few codes at the other end of the DAC will no longer be useful.

This structure bears some resemblance to a class-B push-pull output stage, as each converter is only active during its own signal half. The fun of it is, that it is now no longer necessary to use the DACs for alternating signals, thus avoiding all the problems mentioned above. Instead, the converters can now be used as they were designed to be used: single-sided. The MSB error then occurs at around -6dB, and is totally masked by the music at this very high level.

There are a few tradeoffs I can think of. If there exists a DC offset voltage between the inputs of the summing amp, *this* will be a new zero-crossing error. There are op-amps with a sufficiently low input offset voltage (and temperature drift), but these are quite expensive, say \$30 each. I've asked Technics which one they use, but haven't received a clear answer yet. A second thing is that they use 18-bit converters and switch them up by 2 bits for signals below -12dB, which is how they realize their 20-bits claim. I tend to frown at such complexities. As for the 18-bit converter itself, see my earlier objections. Thirdly, between each converter and the summing amp sits a class-AA amplifier stage, again a very complex circuit, and right where you find enormously high rise-times. All together, this makes the outcome rather uncertain as far as sound quality is concerned. I have never heard such a CD player under circumstances well-known to me. The explained technology will be incorporated in CD players like SL-P333 and SL-P999 (coming soon).

### Fewer bits, higher speed: Philips/Technics

I think it was in 1984, at the Eindhoven AES convention, that Robert Adams of dbx presented a paper on their 1-bit adaptive delta-modulation A/D- and D/A-conversion system. I can remember the Philips people standing around smiling in compassion. 1 bit? Ridiculous.

In 1988, Philips announced their own 1-bit conversion system, the bit-streamer. The first Philips chip containing a 256-fold oversampling digital filter and a 1-bit D/A converter already exists: the SAA7320. It's even available, in Japan, where it was spotted by a Dutch colleague last December. The SAA7320 is a first step and not yet fit for hi-fi applications; it is meant for the portables market. The idea is very promising, though. A 1-bit converter can't be other than linear, as there simply aren't



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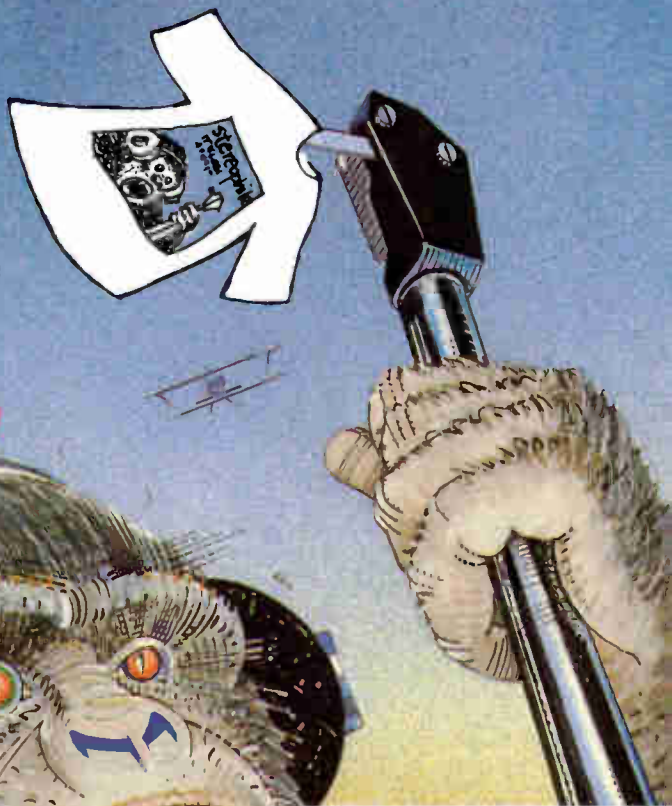


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enough bits to create a ratio problem: there is only one. Of course, you need a very high clock rate if you want to describe an audio signal with just 1 bit. Hence the 256x-oversampling, resulting in an 11.3MHz data stream at the output of the converter. A second advantage becomes immediately apparent: output filtering can be very simple; a first-order network will do. A second-generation chip is under way, the SAA7240, but I'm afraid I can't tell you much about it. You can't imagine how difficult it is to find the right person in Eindhoven to get the information you want. Maybe I'm too close to my inventive compatriots; the wood for the trees and all that.

According to my calculations, 256x-oversampling can cover only 8 bits in a proper manner. I wonder what happened to the remaining information of the 16-bit input signal. The theoretical noise floor in such a system is -58dB (not -48dB, because delta modulation happens to be inherently more silent). So something additional had to be done. Philips employs a second-order noise shaper to arrive at a -90dB noise floor, but I can't see how this recovers the rest of the information present at the input of the digital filter, and I wonder what

it sounds like. Still, I cannot suppress the intuitive feeling that such a 1-bit system is the way to go.

Technics has been working on something similar. That is not as surprising as it may seem, for there has been cordial cooperation between Matsushita and Philips since the 1920s. The Technics people, however, halted at 32x-oversampling. They bought a third-order noise-shaper idea from Japan's National Telephone Company (NTT) to get the noise floor down. And they developed a quasi-4-bit PWM D/A converter to recover the audio signal. Such a PWM converter is a clever thing. Like a 1-bit converter, it has only one amplitude, which excludes an MSB error. The mean value of its output bit stream determines the momentary signal amplitude, the modulation being transferred through variations in pulse-width. Here, too, the output data stream is of very high frequency, and first-order filtering suffices. Again, as with Philips' 1-bit, my calculations indicate an information loss of 7 bits, but let us wait and judge the practical result. The entire process is called MASH, and will be implemented in the Technics/Panasonic SL-P777 CD player planned for launch in late 1989. **S**



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# THE AUDIO ANARCHIST

Sam Tellig

Once you've heard one of today's better preamps—a Vendetta Research SCP-2A or a Threshold FET-10, for instance—it's hard to get excited about most preamps for under a grand. Too much sonic sacrifice. And yet it apparently is impossible to design a good preamp for under a kilobuck—even a good preamp for under \$500, as the Superphon Revelation Basic revealed (no longer available, alas—too cheap for dealers to make enough money). For years, PS Audio and B&K have been making good preamps for under \$1000—although I have not auditioned their most recent models. The PS Audio preamps, in particular, have been noted for their dynamic capabilities, if not their sonic subtlety. Well, you can't really expect a killer preamp for under a kilobuck.

I was very disappointed with two samples of the Sumo Athena preamp, which looked nice, but didn't sound all that great—veiled, with splashy sibilants through the phono stage. Moreover, I have reason to suspect that one sample of the preamp had DC present on its outputs—it shut down a pair of Jeff Rowland Model 7s and blew up (literally) a VTL class-A 30W monoblock, for which I owe an apology to David Manley, who, I must say, was very understanding. This preamp also caused a pair of B&K ST-140 monoblocks to make some strange and very ominous noises (fortunately I turned them off in time). I have grown disappointed, too, but only mildly so, with the Adcom GFP-555. I find the sound somewhat veiled and lacking in dynamics. Smooth, sweet, and non-fatiguing, though. I do not know of a better full-featured preamp for \$495.

Never fear. I've found two other preamps for under \$1000 which are well worth considering. One is the Moore, Frankland Associates (MFA) Magus, now in its A-2 version and retailing for \$895. An all-tube unit, beautifully built and even more handsomely finished, this is a preamp that must be auditioned if you are shopping in this price range. You'll have to search some to find an MFA dealer, but it's worth it. I apologize for not writing about this preamp earlier. A sample of the A-2 version should be arriving any day. If the idea of a

reasonably priced tube preamplifier appeals to you—particularly the idea of running your CD player through bottles (a tube line stage)—then check this one out, as I plan to do. The earlier versions were very good indeed, if lacking in ultimate ability to resolve fine details.

## The Forté Model 2

Meanwhile, this month, let's look into a solid-state preamp which sells for about the same price as the MFA Magus: the \$890 Forté Model 2, which is distributed by InConcert, the parent company which also owns Threshold. Like the Threshold gear, Forté equipment is designed by Nelson Pass, who is, as you probably know, one of the most accomplished designers in the business. The Threshold FET-10 preamp, at \$3550, is as good as everyone else says it is.

Wonder of wonders, the Forté Model 2 is also a winner, and easily the best solid-state preamp for under \$1000 that I have yet encountered. No need to read between the lines here—I really love this preamp, although it is possible I might like the Magus A-2 even more (regular readers know my fondness for tubes).

I have Dean Smith to thank for this one—a salesman at Take Five Audio, in New Haven, Connecticut. Dean insisted that I take a listen to this preamp—claiming, among other things, that the Forté Model 2 could be used successfully with Threshold amplifiers, this in order to cut costs when a customer could not afford a Threshold FET-10 or FET-9.

Was Dean ever right! The beauties of this preamp are that it does nothing wrong, and that it can accommodate all but the very lowest-output moving-coils straight in, with no step-up, and with very low noise. The downside of the preamp is that it is lacking in features. But that's the whole point of the preamp, as Nelson Pass explained it to me. "When you pile on the features, you add to the cost. Or you have to make sacrifices in the parts quality. We wanted to keep this preamp as basic as possible, using the highest-quality parts and the simplest design."

Indeed, the Forté Model 2 shares some parts in common with the Threshold FET-10. The same Noble potentiometer, for instance. And

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### Forte Model 2 preamplifier

the same gold-plated, Tiffany-like RCA output jacks. I could swear that the knobs come from the same supplier that Levinson uses. This is a very elegant piece of design, inside and out. You must take off the top plate—indeed, you must, in order to optimize the cartridge loading—and appreciate the extraordinarily neat and simple internal layout of this preamp, with very short and direct signal routings. The power supply, incidentally, is external—which I'm sure also adds to the good sound.

Mind you, this is no FET-9 or FET-10, which use discrete transistors. The Forté Model 2 employs an integrated circuit for its front end (not its output)—indeed, the same premium Linear Technology LT-1028 chip found in the front end of the Adcom GFP-555. A difference is that the Adcom is a less-simply-executed design, featuring (defeatable) tone controls, lots of switching capability, and the like. The Forté is simpler, as I said, and I think that simplicity results in cleaner sound. In addition, the 1028 chip is said to have an output stage heavily biased into class-A.

Discrete circuits are better than integrated, right? Well, yes, I suppose they are. But also more expensive. And, as Nelson Pass points out, it is easier to achieve low noise with the 1028 chip than it is with discrete FETs. Unfortunately, the chip limits the ability of this preamp to swing more than 18V output. A Threshold FET-10, by contrast, is able to swing up to 44V, which is probably why the FET-10 sounds so much more dynamic.

If there is a weakness in the Forté's sonic performance, that's it—the dynamics are somewhat reined in, along with the soundstage. On the other hand, the sound is not closed in or congested. It's just that other well-designed and more expensive preamps can do better.

The other possibly bothersome aspect of this preamp is the lack of features. It may bother you, but it doesn't particularly bother me. I like a lack of features—it spares you the temptation to twiddle. There are no tone con-

trols, but there is a balance control, thank goodness. The one missing feature I wish *were* present is a mono switch.

What's noteworthy about this preamp is its ability to accommodate fairly low-output moving-coils (down to about 0.2mV output) with enough gain and very low noise. There are three banks of DIP switches inside the preamp. One adjusts the gain—three settings for moving-magnet, high-output moving-coil, and low-output moving-coil; 40, 50, or 60dB gain at 1kHz. This is the way to do it! Another bank of switches lets you adjust the impedance, down to 22 ohms (I used 100 ohms with my Audio-Technica AT-OC9), and a third bank of switches allows you to adjust capacitance. In other words, it takes about 30 seconds to tailor this preamp to accommodate virtually any cartridge, except for very-low-output Ortofon and the like. No need to futz with a bag of resistors, *à la* PS Audio. This arrangement is similar to the way Klyne does it. The only thing missing is the ability to roll off the top end of moving-coil cartridges, but why would you want a peaky moving-coil in the first place, when you can get a neutral moving-coil like the AT-OC9 or the Krell KC-100?

Another piece of good news is the line stage. True, you can't switch it out, as you can with PS Audio preamps or the Sumo Athena. But then I don't know why you would *want* to switch it out. The line stage actually seems to help the sound coming from the CD players I used—it makes the players sound a little smoother, sweeter, if perhaps marginally less detailed. . . . just a slight tinge of euphonic coloring, perhaps.

I'm bothered by just one thing (besides the lack of a mono switch): There is no automatic mute relay protection. No problem, most of the time—the preamp is meant to be left on (there is no on/off switch). But there is no protection against a momentary power interruption. The preamp goes off and then comes on with a pop. It could possibly damage your equipment. I

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**Threshold SA-3 power amplifier**

believe this borders on the irresponsible. The preamp also lacks a mute switch. That's not so troubling—you can always turn down the volume or use the signal selector as a mute when cueing records.

If you can live with the lack of features, and don't mind sacrificing some dynamic capabilities (compared to more expensive preamps using discrete circuits), and if you want a good solid-state preamp that will accommodate low-output moving-coils and not force you into using generally inferior higher-output moving-coils, then the Forté Model 2 may be the preamp for you. I recommend it very highly indeed. I found it to have no significant sonic shortcomings, aside from dynamics. For an \$890 preamp, that is very high praise indeed.

### **The Threshold SA/3**

Strictly speaking, I should perhaps be reviewing one of the Forté *power* amplifiers—my friend Dean says they are really good now. (The original version of the Forté Model 1 amplifier was somewhat disappointing—dark and lifeless.) Instead of opting for the Forté amp, I decided to audition Threshold's least expensive pure class-A amplifier, the SA/3 (\$2900).

Like other Threshold products, this amplifier is beautifully built and impeccably designed, except for one tacky touch: over the power switch and the name badge there is a legend which reads, "Handcrafted." Ugh! I am surprised at product designer René Besne, who, in general, has such exquisite taste.

I'm not going to get into all the technical stuff—"stasis" operation, optical bias class-A. It's pretty boring. What's significant, I think,

is that, while rated at "only" 50Wpc, the SA/3's output current capability (16 amps continuous, 80 amps peak per channel) makes the amp sound more dynamic than the 50Wpc RMS rating would suggest. I certainly had no trouble driving my Martin-Logan Sequels (last year's version) or my Thiel CS1.2s. The Threshold SA/3 also did very well with my friend Lars's infamous ESB speakers (power-hungry), and even reasonably well with the old version of the Wilson WATTs, with their cruel impedance dip to below 0.5 ohm. If you want a Threshold and don't have big bucks for one of the more powerful models, this could be the amplifier for you.

Before I get into the sound, I should say a few words about why you might want to buy an expensively built solid-state amp like a Threshold, or a Rowland, Krell, or Levinson for that matter. The reasons are reliability and predictability. These premium-quality solid-state amps typically go on performing, up to spec, for year after year. One is tempted to say that they last forever. I would bet that 95% or more of the Threshold amplifiers ever made are still working—still giving someone pleasure, if not the original owners. Ditto for Krell, etc.

Furthermore, these better solid-state amplifiers, once broken in, tend to sound consistently good. Tube amplifiers, by contrast, must periodically be re-biased and re-tubed. There is a gradual, subtle, scarcely noticed fall-off in performance as the tubes age. And tube amplifiers tend to be less reliable than solid-state amplifiers. They may last as long—even longer, like my son's 25-year-old Marantz 8. But you can expect that tube amps will need to be

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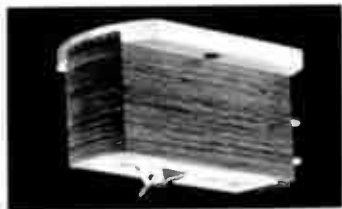
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Some years ago, I had the chutzpah to ask Dan D'Agostino—how I love to tweak the tiger's tail—why he didn't design tube equipment. "Tubes?" fired Dan. "They don't sound the same from day to day, never mind month to month or year to year." Maybe he's right. The problem is that I have days when solid-state gear doesn't sound as good as it did the day before.

Okay, back to the Threshold SA/3. This is a difficult amplifier to fault. But I shall try! (Don't you love this, Nelson?) It is very smooth, very sweet, and nicely detailed. It gets better and better as it breaks in over a period of weeks and months—smoother and sweeter still. For the very best performance, you might want to leave the SA/3 on all the time. Fortunately, for a pure class-A amplifier, the SA/3 runs only warm, not hot—Threshold has clearly provided adequate heatsinking. You can probably leave it on all the time without too much discomfort, except for the very hottest days of summer.

A good class-A amplifier like the SA/3 has much in common with a good tube amplifier. Timbres sound natural—sweet, smooth, lacking in the subtly annoying distortion that typically mars one's enjoyment of even some very good class-A/B solid-state amplifiers. You know I am partial to tubes. And with a good class-A tube amplifier, there is a certain crystalline clarity which I usually find lacking on class-A/B solid-state amplifiers. The SA/3 has this crystalline clarity. But if you insist on solid-state—and there are very good reasons for doing so—then I recommend going class-A, which means Threshold or Krell rather than, say, Jeff Rowland Design Group, whose amplifiers (those I've heard) sound, to me, slightly grainy and subtly veiled. Subjective opinion, of course.

It's interesting to compare the class-A sound of the Threshold SA/3 with the Jeff Rowland amplifiers—most of my listening has been with the Model 5 and Model 7 monoblocks. The Rowlands are fine amplifiers—this is not to disparage them. In fact, I can understand why they have achieved such popularity. In common with a very few solid-state amplifiers, including the humble B&K ST-140, the Rowlands are able to convey a sense of bloom, of ambience, of space around instruments. The performers are not cardboard cutouts (thank you for this wonderful analogy, John). At the same time, I

find that the Rowlands lack the last ounce of resolution and clarity which I find, for instance, in the latest generation of amplifiers from Threshold and Krell—which just happen to operate in pure class-A.

There's a reason for the digression. I found the Threshold SA/3 somewhat lacking in its ability to convey a satisfactory sense of acoustical space—palpable presence, if you will. The SA/3 tended to make analog LPs sound more like CDs—lacking in air and ambience. It also tended to make several good CD players sound more or less alike. As I commented a couple of months back, the 'umble B&K ST-140 seemed to do a better job of revealing the differences among players than the Threshold SA/3.

It's a difficult call with the SA/3. There is nothing really wrong with it—it's detailed, smooth, and very sweet, exquisitely so for a solid-state amplifier. It runs reasonably cool. It looks nice. It's beautifully built and presumably rock-steady reliable. All points in its favor. But, rightly or wrongly, I got the feeling that all the music wasn't there—specifically the space around the instruments and the silences between the notes. While I would not go so far as to say the performers were cardboard cutouts, they did not sufficiently come to life, as they did with the B&K.

I should mention, too, that the SA/3, while it has high-current capability, is not a super-powered muscle amp. The bass, while reasonably deep, tight, and dynamic, could be deeper, firmer, and more dynamic still—an Electrocompaniet AW100 clearly outperformed the SA/3 in this regard, and, at \$2195, retails for \$700 less.

Remember my friend Lars from last month? I tried the Threshold SA/3 on Lars's power-hungry ESB speakers. The Krell KSA-80 sounded more open and dynamic—more balls, deeper, wider soundstage. Not surprising, perhaps. The Krell has more power. It also costs \$1000 more than the Threshold. As with the Threshold, though, I am not certain of the Krell's ability in the palpable presence department—that area in which B&K and Jeff Rowland amplifiers succeed so well. Lars is quite happy with his Krell KSA-80, so much so that he is thinking of buying another and running a pair of KMA-160s. Who am I to spoil Lars's fun? But when the Krell KSA-80 goes back for transformation into a KMA-160, I shall lend him my B&K ST-140 again, and we shall see what happens.

I have to say that the AE1 is one of the finest, most transparent cone speakers I have heard.

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*John Atkinson, Stereophile, Sep 1988.*

This is without doubt a wholly remarkable loudspeaker, and a stunning endorsement of the well developed metal cone bass units.

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...to the author's knowledge, the most awesomely dynamic and articulate miniature ever made.

*Alvin Gold, Hi-Fi Choice, Jun 1988*

There is no point beating around the bush – the speakers are a revelation. Their dynamic performance is in advance of anything I've heard before.

...And what a product. Few new companies in the hi-fi field can boast a speaker that leapfrogs existing references and sets new standards of technical and musical excellence.

*David Praker, Hi-Fi Answers, Mar 1988.*

The AE-1 has an 88dB/W sensitivity, and is designed to handle – and I mean *handle* – something like 200W. But those are just numbers – the reality is quite extraordinary.

...As astonishing as the dynamics of the AE-1 are, so too is its bass extension, which has depth and fullness quite out of line for a speaker this size.

*Alvin Gold, Stereophile, Aug 1988.*



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As for the Threshold, well . . . what do I say? It's a smooth, sweet, clear, entirely capable amplifier. But I hesitate to call it a "great" amplifier, and at "only" 50Wpc for nearly \$3000, I think it should be. Specifically, what I miss are: 1) ultimate dynamics—the Electrocompaniet, for example, did better for less money; 2) ultimate resolution—here, too, the Electro did better (I don't have enough experience with the Krell to tell); and 3) the subjective shortcomings in the palpable presence department.

Before I spent \$3000 on an SA/3, I would carefully consider my alternatives: an Electrocompaniet AW100 for \$700 less; a Krell KSA-80 for \$1000 more, with its possibility of upgrading to a KMA-160; a good pair of tube amplifiers from Quicksilver, VTL (for under \$2000/pair), or Moore, Frankland Associates (for \$3000/pair). **S**



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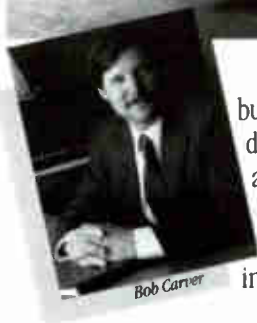
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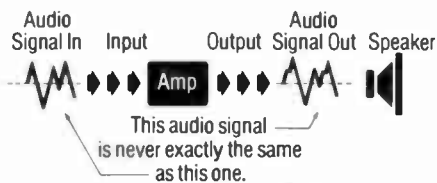


Good question, but before I get deeply into the answer, let me tell you a little bit about amplifiers in general.

Every amplifier known to humankind changes the audio signal just a little bit as it passes through from input to output. This is because, simply, no amplifier is absolutely perfect, and each must, because it exists in the real world, slightly modify the audio as it goes through.

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amplifier design, are responsible for the characteristic 'sound' or 'sonic signature' of different designs. And each is ever so subtly unique.



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# unction?

By Bob Carver



Does that mean a dirt cheap amplifier can be made to sound the same as a \$5,000 reference amp?

I wish it were so, but no, not by a long shot. In order to successfully give an amplifier a specific transfer function, the basic design must have fundamental performance characteristics that equal or exceed the reference amplifier from which the original transfer function was obtained.

For example, the 'dirt cheap' amp must have a lower noise floor than the reference; it must have instantaneous current and voltage rise time speeds as fast or faster; it must have an intrinsic input impedance equal to or greater than the reference.

Its output voltage swing must be greater, its phase shift must be less, and of course, its output power must be at least as much. Then, and only then, can the reference transfer function be successfully cloned into the 'copy-cat' amp, and unfortunately, the 'dirt cheap' amp becomes not so dirt cheap anymore.

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## CARVER

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**A**n audiophile's visit to Miami would not be complete without a stopover at Peter McGrath's audio salon. The following interview took place in August 1988, at Peter's Sound Components store in Coral Gables. As you will see, Peter McGrath is a multi-faceted individual, and the conversation touched upon a variety of topics. Despite the fact that Peter had a flight to catch and time was rather limited, we still managed to fill over 25 pages of transcript. From all of this material I've tried to condense the essence and flavor of the conversation with a minimum of logical discontinuities or breaks, but I apologize in advance for several sudden changes in direction.

**DO:** Peter, you wear at least two hats that I know of, as owner of Sound Components and also as one of the principal functionaries in Audiofon Recordings. What other hats do you wear, and which do you enjoy most?

**PMcG:** Well, I don't know if I can answer in terms of enjoyment, but I can tell you that certainly the most important hat is that of ownership of Sound Components. I'm also president of Audiofon Recordings, and that is clearly more a labor of love. It's not an activity that provides for my financial needs, *vis-à-vis* children and wife, etc., but it provides me with the spiritual needs of continuing as a successful retailer. I'm also on the board of three orchestras, and feel a very strong commitment to the musical vitality of the community in which I live. I'm very much involved as a freelance recording engineer, but principally have assumed the role of chief recording engineer in the US for Harmonia Mundi. While I have no official involvement with that company, over the last five or six years I've enjoyed a very close working relationship with them and have had the pleasure of doing a number of very beautiful recording projects with them.

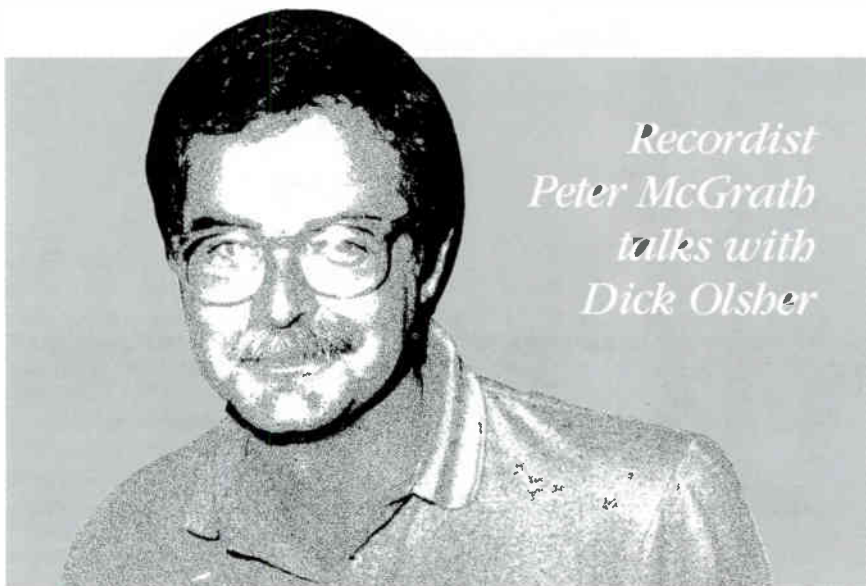
Another hat, I guess, is as the recording engineer for the local classical radio station. I do all of the local concerts and broadcasts. And then I'm a sailor, and that has nothing to do with any of the above, thank God! I enjoy sailboat racing and cruising.

**DO:** I presume your love of music is where the recording interest came from. But why commercial recording? What motivation is there? There are a lot of labels out there, even a lot of audiophile labels. . .

**PMcG:** It's an interesting question. I don't have a clear answer, but I can start by talking a little bit about my history, and how it led there. I got into audio kind of backwards, and then got into recording kind of frontwards. I have a master's degree in photography, which I earned at the Institute of Design in Chicago, which was a part of the Illinois Institute of Technology. While going to graduate school there I had a part-time job working at a hi-fi store. I had always had an interest in audio and in music. Then I progressed to the point where I was manager of a store called The Stereophile.

**DO:** *The Stereophile?*

**PMcG:** Actually, it was called The Audiophile, but we choose to remember it fondly as The Stereophile. It was, I think, one of the first high-end salons in the country, started by Dave Shooks many years ago. Anyway, when I moved down to Florida to finish up my graduate pieces in photography, it became apparent to me that there was nothing in audio down here comparable to what I was used to up there, and a light went off—"Well, I'm going to have a degree in photography which is about as useful as tits on a bull." Other than teaching, there was really nothing I could do to provide a livelihood. I loved the medium, and I loved what I had learned; I had studied with a photographer named Gary Winogrand, who was an intensely profound teacher to me, somebody who wound up a very close friend. Anyway, my wife



*Recordist  
Peter McGrath  
talks with  
Dick Olsber*

and I were deciding what we were going to do, and thought about teaching. I kind of dismissed that and decided to open up a high-end store. Years of involvement in the high end went by, and I got very good at it, and enjoyed some success. Two or three years into it I met Mark Levinson, for whom I became a dealer. Mark made some casual observations about the fact that, gee, one of the reasons that he, Mark, had started his company was that he never could find equipment that was adequate for his recording projects. I hit him with the idea that, well, gee, I'm having a hard time finding software that does justice to the equipment that you're now making; how could I learn a little bit more about finding software?

At that point Mark invited me to attend a few recording sessions he was engineering, and I was simply fascinated. Immediately a parallel started to develop in my own line, along the lines of what I was doing in photography of documenting visual events. I started applying many of the same fundamental principles to recording—documenting sonic events. First, Mark sort of led me like the horse to water, and then I started doing recordings, and then I started developing my own philosophy. The philosophy has fundamentally remained almost the same from the time I started, which is to keep things very simple. Two microphones, a very high-quality microphone preamp, a very high-quality tape recorder, and so

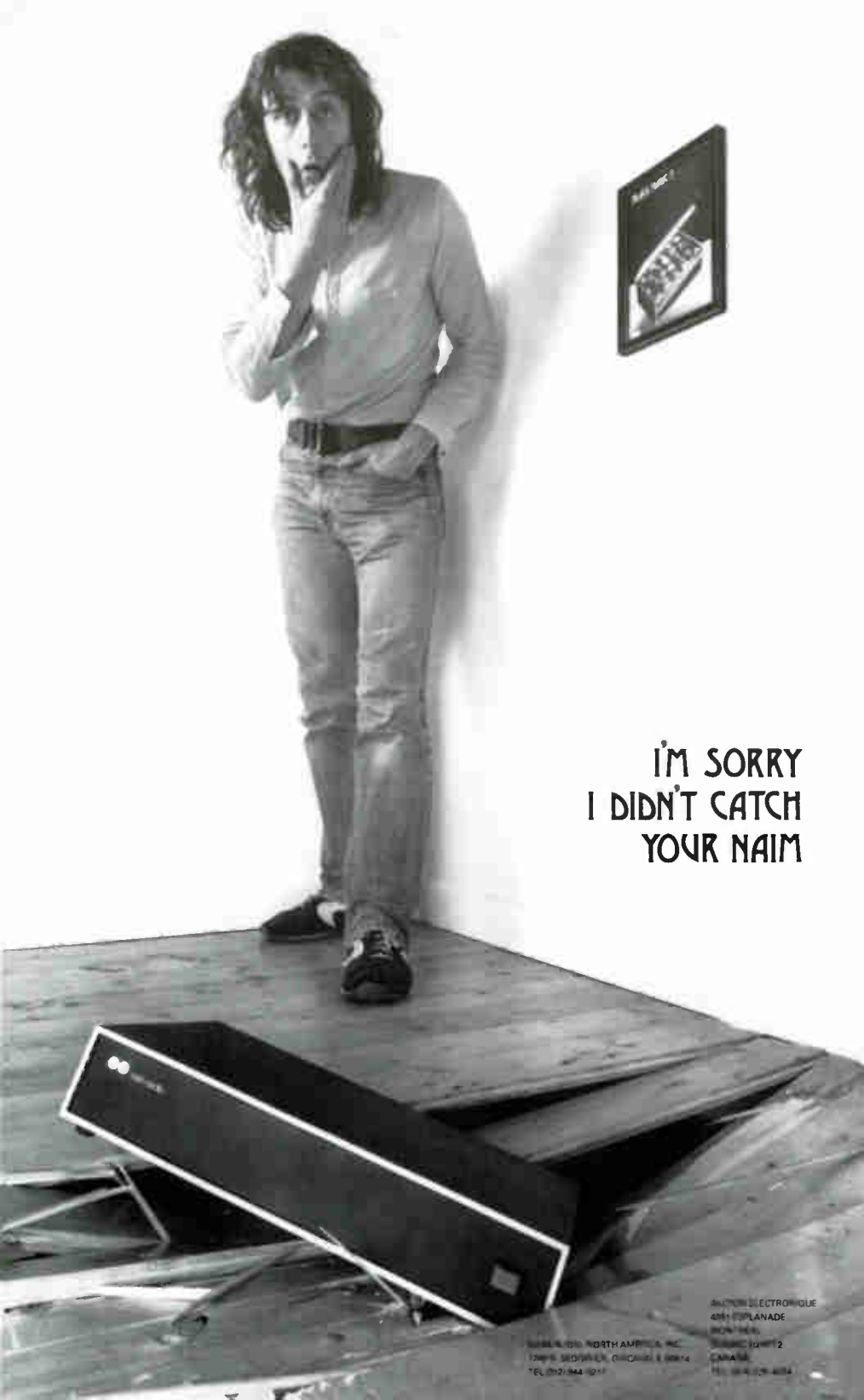
forth. Through a series of fortuitous accidents I met some good people, particularly Julian Kreeger, my partner at Audiofon Records, who opened up the world of really superb musicians so that I'd have the opportunity to work with some absolutely wonderful people and

*We have preserved some  
phenomenally gifted artists at  
the peaks of their careers.*

make some really significant recordings, recordings that both Julian and I feel have made a substantial contribution to the world of music. We have preserved some phenomenally gifted artists at the peaks of their careers, and I'm very privileged to have been involved with them.

**DO:** *As a recording engineer then, do you feel the emphasis should be on the equipment, the mike, the preamp, or on the technique itself? Or is it a combination?*

**PMcG:** I can't really distinguish significantly between any of those things. I think it's a *Gestalt*. Basically, it all works together. And I can again draw parallels to photography in the sense that you can put a camera in the hands of anybody and they're going to make a certain kind of picture, and you put a camera in the hands of a Gary Winogrand and you're going



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**Purist miking, with two omnidirectional microphones, precludes overdubs, but Aaron Rosand manages somehow.**

to walk away with things that are just simply mind-boggling. Certainly that isn't quite the degree that is occurring here, but it's somewhat similar. The equipment is very important, but I think a lot of it has to do with, obviously, the musician, the hall, and the equipment. I tailor everything to come together. I don't use the mikes I use because they favor a piano, but because they have no color of their own. They favor everything.

**DO:** *I personally get irritated at the dogmatic viewpoint that there is one ideal recording technique; that only a single-point technique matters.*

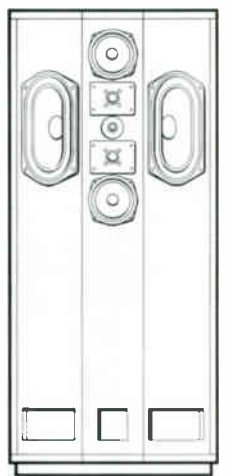
**PMcG:** It profoundly upsets me, because most people who hold to this kind of dogma—and there is one particular individual on the West Coast who's a friend of mine and is extremely dogmatic about it—say, in effect, that record-

ings made with anything but a Blumlein technique are simply invalid and phoney.

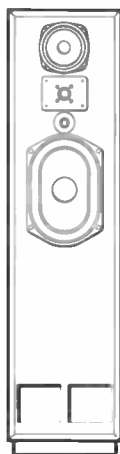
**DO:** *Faked somehow?*

**PMcG:** Faked somehow. And all I say is, just listen to what I do. To have someone like Aaron Rosand turn to me after hearing a playback of what his music sounds like in the hall that we recorded, with tears in his eyes, saying he's never heard himself sound so beautiful before; who the hell is to impose his dogma on that?

You know, the fact that I didn't use that technique is rubbish. I mean, I'm not saying that good recordings can't be made with one technique or the other. What I do feel somewhat dogmatic about, and only because it works for me, is that I like two microphones. I'm comfortable with that. It makes sense to me. I like keeping everything as simple as possible. I don't necessarily mike for the music—I like



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for the hall, particularly if I'm doing a recording session. Not a live event, but a session where we have freedom. Then we balance by positioning the musicians to get the balance we want. It's an interesting kind of perspective. Again, using a photography parallel, it's like taking a large-view camera on a tripod, putting it where you get the composition you want, then arranging the subjects within the frame.

I use a pair of spaced omnis. I've gotten good results with that technique. I've tried everything I can lay my hands on, ranging from crossed figure-eight ribbons to ORTF with hard cardioids. I've even tried multi-miking, using a combination of Blumlein with spaced omnis, three spaced omnis with mixers and so forth, and ultimately it all comes back to the fact that I'm most comfortable with the two spaced the way I use them.

Again, likening it photography, a lot of photographers may have 15 lenses in their camera bag, but if they look back they find that 95% of their most successful images were made with one lens. Because, ultimately, that's how they intuitively learn to see. For me, it's much the same. Ultimately it's how I intuitively learn to hear. I've worked out in my own mind the stereo image, so to speak, that these two mikes make. And I can predict—previsualize is the photo term, pre-hear the audio term—what these mikes hear. I know what they hear, and therefore I know how to extract the results I want from them.

**DO:** *With a single pair of mikes you essentially have one point, or one plane, in the concert hall to work with. Then, out of an infinite number of points, the question becomes which of those points is really best? I suppose that's where the recording engineer exercises quite a bit of creative control.*

**PMcG:** Yeah, well, it's pretty pragmatic. To some extent, it's a function of ratios—what the direct ratio of reflected sound is going to be and how you want to strike that balance.

**DO:** *Of course that changes from hall to hall.*

**PMcG:** It changes from hall to hall. And it changes from the expressed intent and desire. In other words, I can in the same hall, with the same piano, with a different artist, achieve a totally different kind of sound simply by moving the mike a foot, or three inches in fact. It will thoroughly please one pianist and thoroughly distress another because there's too much reflection, or not enough intimacy and

*We mike every artist differently to some extent.*

percussion in the sound of his instrument, etc. You have to strike a balance that satisfies. The other thing is that, when we mike, particularly here in Miami when we're doing piano recordings, both Julian and I are very democratic. I think this is part of the process that sets Audion apart from other recording companies: there's an interchange between what Julian and I are after and what the pianist is comfortable with. In other words, we set up in the hall, move the mikes around, do a bunch of test tapes, and then we come back to this room that we're sitting in, usually with a pair of Quads or Duntechs. We then sit down, listen, and pick a sound that puts a smile on the face of both us and the pianist at the same time.

We experiment, then we make a selection. Usually that selection will be something that represents to some extent the way I look at it. If you were really astute in, let's say, piano literature, and knew that tonight you're going to have Michael Ponti playing Scarlatti on a particularly warm-sounding European Steinway, and you know the acoustics of the hall and that the hall will be empty, you'd probably say, "Okay, obviously I want to sit somewhat to the left so that I can see his fingers, and I know that if the piano has a certain warm sound, the Hamburg Steinway doesn't project that aggressively into the hall. It has a lot of detail, and the Scarlatti has a lot of fast stuff, particularly when Ponti is playing it. Maybe I want to sit a little closer."

**DO:** *By closer you mean. . . ?*

**PMcG:** You may want to sit only six or seven rows back. And the next night you're going into the same hall, but this time you've got Earl Wild doing Liszt, on a Baldwin. Well, that's a grand scale. That's a big sound. That's the sound that's going to be warm, but somewhat clanging when he really punches out, and you want to be swept up by the scope of what is about to occur. You may want to sit three or four or five rows further back and just be engulfed in it. So you then assume that fantasy seat in the hall that's further back. And I think that legitimizes what I do also. That we mike every artist differently to some extent in relationship to the

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repertoires he's going to play, to some extent in terms of the specific sound of the given piano. This is all within the context of the same hall, using the same microphones, the same techniques, and the same equipment, but these are the subtleties that I enjoy playing with. I don't really view it as creative. I view it more as just simply consistent with a certain philosophical understanding of what it is that we're trying to achieve.

**DO:** *I was thinking of the photographic analogy you made earlier; you're essentially using a different lens in this case, focusing to a different plane.*

**PMcG:** No, what I would say is that I'm using the same lens, I'm just moving the camera to a different vantage point. I'm not changing the lens.

**DO:** *What about trying to capture spatial relationships; trying to reproduce the soundstaging? That is a very difficult thing to do. I don't quite get the same sense of space in the concert hall that I do in my listening room.*

**PMcG:** Sometimes, though, there are things that happen spatially with a pair of spaced omnis which may be distortions of the true spatial signature. But when I'm lucky, or when I have the time to really work these little things out, I get a spatial thing with my mikes that is really quite lovely. Exactly what relationship it bears to what you would hear if you were where the mikes were in the hall, who knows? But in terms of what you get back through a pair of spatially coherent speakers such as Quads, Duntechs, WATTs, or whatever, the sense of positioning and front-to-back and ambient details, etc., those things are truly wonderful.

How accurate it is to the original I don't really know. Because, again, we're dealing with two point sources trying to create the illusion of a large soundspace. You're basically dealing with sleight-of-hand. One of the things that you do, again, is like photographing: You're taking three dimensions with the scope of what the eye sees, and trying to describe the intuition of what you saw, or the perception that you had, within the confines of four walls.

**DO:** *How do you avoid a hole in the middle with spaced omnis?*

**PMcG:** Oh, that's not difficult to do. No, that's a mistake, if you have that. That's something you know right away.

**DO:** *Is it a function of by how much the micro-*

*phones are separated?*

**PMcG:** No, with the mikes it's absolutely fascinating. The positionings of these mikes, particularly the Schoeps that I use, have their own kind of peculiarities. And sometimes, when you feel it makes sense to move them closer together, it actually makes sense to move them further apart. It's hard for me to express—I've just found that if you move one way, the opposite occurs. So you really have to be prepared. If I get a congestion, so to speak, in the center, I'll move the mike closer together and it seems to open it up in the middle. Sometimes if I've got a hole in the middle, I actually move them a little bit further apart. There's a peculiarity, maybe, of the off-axis radiation of how these mikes pick up. I don't know.

**DO:** *The reason I'm focusing on the choice of mikes and the technique is that I've heard some pretty phasey results in the past and I don't think the situation has changed much with, say, the Telarc releases.*

**PMcG:** I don't know what it is about their recordings. Some of them are very good, some of them aren't. What I would love to do, to be able to make an intelligent evaluation, would be to plug my Stellavox into their mike board and then hear for myself. Because I don't know how much of that is a function of the Sony 1610 or 1630, or whatever they're using. All I can say is that there's a lot of change that occurs to my tapes after they've been pushed through that digital wall in terms of phasing and ambient information and so forth. I believe Jack Renner is still using three omnis, and one of the things that the use of *three* omnis necessitates is some kind of a blending circuit, which means more circuitry, to me more problems. Other than a level control to set the gain on the mike, I have no panpotting, no crossblending, no possibilities of crosstalk or whatever because I'm just using two mikes, one point to each channel of the tape recorder. There's a lot to be said for that. I think you retain a lot of integrity in terms of the electronics by doing that. That might be part of the problem.

**DO:** *For a small combo such as a quartet or quintet, piano, violin, or something similarly small, a pair of spaced omnis seems to do quite well. What about trying to record a full orchestra that way?*

**PMcG:** If you have the hall and the time, you can do the Mahler Second with two spaced omnis.

# Pedigree



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*If it's beautiful music with bad sound, I have no problem.*

*away from musical values. I know a lot of audiophiles who always want recommendations that have to do with sound quality, never mind that this is the definitive musical performance of such and such. I think that's a dead end.*

**DO:** *The key word here is if you have the right ball.*

**PMcG:** If the sound exists naturally within the space. Indeed, that's what the music was written for. Presumably you can get it to sound right, and if it does sound right then it's just a question of finding where to put those two mikes.

**DO:** *What do you do in a situation where the ball is not suitable?*

**PMcG:** You don't record in it. That's one of the advantages of doing the Audiofon recordings. With Harmonia Mundi, it's a nightmare trying to find halls that combine the right acoustical properties with the lack of noise and accessibility, etc., etc., all of these things you have to check off a list. They all have to be in place.

**DO:** *So, just like the prophet, you'll go to the mountain if the mountain will not come to you.*

**PMcG:** Precisely.

**DO:** *At what point do you throw up your hands and say, "God, I know this is great music, but the sound quality and the miking just get in my way. I just can't handle it any more!" Is there a point where you throw in the towel?*

**PMcG:** Well, I have 15,000 records in my collection and probably over 1000 CDs, and the number's climbing every day. If it's bad music with beautiful sound, I have a problem with that. But if it's beautiful music with bad sound, I have no problem with that. You wish, and it's not without regrets, but you still listen. I'm not saying I condone the early Columbia/Leonard Bernstein type recordings, but on the other hand it's the only way you're going to be able to hear him. And for me, that's indispensable music.

**DO:** *As an audiophile, you get into a situation where you're collecting a set of LPs for use in assessing the merits of equipment. And what you're looking for is not necessarily the most musical performances, but rather performances that were done in a purist manner and supposedly represent what's on the master tape. So we sort of tend, as audiophiles, to get*

**PMcG:** I couldn't agree with you more. Frankly, I think we've moved beyond that. In terms of my retailing, I have no patience for audiophiles anymore who have no interest in music. Part of that impatience stems from my involvement in recording, particularly with musicians. I feel like I've been allowed, through fortuitous circumstances, to see the world of audio differently. And I'm eternally grateful to the people I've met, like my partner Julian and people like Robina Young at Harmonia Mundi, who have allowed me to get deeply involved in it at a much higher level. I recognize all too well that I've got to make my living selling equipment, otherwise I couldn't indulge in these other activities, but I also recognize that this involvement in recording has allowed me a much better perspective, that I would otherwise never have had, to help people in their selection of equipment through what I've learned.

*This involvement in recording has allowed me a much better perspective.*

Simply stated, Dick, would you hazard a guess as to how many people you see in the lobby of a concert hall who own audio systems worth \$5000 or more? I'll put it another way. Of the people in the lobby who make \$150,000 or more in annual income, and go to concerts regularly, what percentage would you guess own a \$5000 or more stereo system? In other words, these are people who have demonstrated two fundamental factors: the means and the interest.

I bet none of them do. I don't think anybody's ever done the statistics on this, but I would wager that if we were to say where this industry has succeeded or failed, I think it would be very clear that this industry has failed miserably in attracting the music lover. And this is where our goal has to be set. This is where

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the future lies. We've got to be able to communicate to the music lover that this stuff is for him. It's not for the audiophile. It's for the music lover.

**DO:** *Do you think most music lovers actually can appreciate wide-range, audiophile-caliber audio systems?*

**PMcG:** I think it can be easily demonstrated to a music lover that, my God, this system or this pile of stuff that they're listening to can create a musical feeling within them that they couldn't otherwise achieve with lesser equipment. That's the whole objective. Unfortunately, most stores and manufacturers selling the equipment are basically getting stuck on the means, not the end. Now, obviously I'm in business to sell equipment. The means to the end is my livelihood. And the means is very, very important. But it is *only* a means. The end is the music, and I think where we derail the music lover is when we intimidate him with the focus on the means, and not the end. A lot of that stems from musical illiteracy on the part of salesmen in stores, the people who make the equipment, and the musical illiteracy endemic to our whole damn business.

**DO:** *What should the ideal equipment have most of all?*

**PMcG:** It has to create excitement. It has to create the sleight of hand, the believability—

**DO:** *Let's try to break down "excitement." What are the elemental components of excitement? Are you talking about dynamics, a system that can go from soft to very loud?*

**PMcG:** No. Excitement can occur in a music system where, let's say, a harpsichord is being reproduced, which is non-variable in dynamics. I think it could be simply stated that the better the system, on any level, the measure by which your system is good for me is simply the degree to which it does not get in the way of altering the original signal. That's a very broad statement, but it's a very simple and factual one. Resonances are one. Limiting the dynamics. In other words, I don't look for a system to amplify dynamics; all they can do is limit the dynamics of the original recording. All I'm saying is that a system can only be evaluated in terms of the degree to which it does not get in the way of the original recording. *Not* reproducing your fifth row at Carnegie Hall; that's crap.

**DO:** *What do you feel is the weakest link in the average home system?*

**PMcG:** The speaker and the room. Most people have difficulties with the room, and they don't have the freedom to put the speakers where they want them. They don't have the freedom to do what they want to do with the room. And then the speaker interfacing with the room poses the biggest technical problems.

**DO:** *Somebody comes in and says, "Gee, I've got a small room, something on the order of 15 by 20 feet," which is not very far from the dimensions of my listening room. And there's a spouse, and the speakers are going to have to go pretty much against the wall. What do you tell somebody in that predicament?*

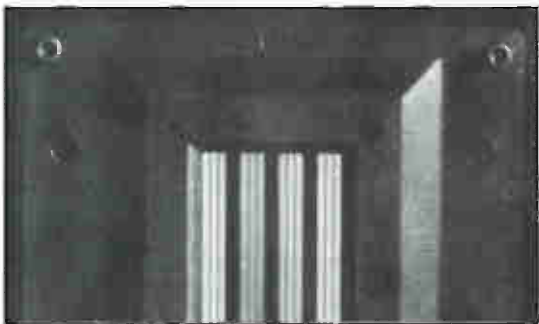
**PMcG:** That's part of why we spend a lot of time talking, and we invite the spouse in. A lot of times the restrictions that that person will come in with are restrictions that are based on preconceptions. We try to get the spouse actively involved in the decision-making process. A lot of times they've got a spot carved out on the bookshelf where these little bookshelf speakers are going to go. That's all well and good, but before we let them get away with that, I might play them a pair of Magnepans.

**DO:** *You plant the seed.*

**PMcG:** You plant a seed and let them experience it. Because they've never seen, heard anything like that. And then you play some beautiful recordings. And then they say, "Well, that's exciting. That is really beautiful. Well, maybe I can put these in the room, because if that's what I have to do to get this sound, maybe I'll open my mind to those possibilities." But if they come in and say that they just have no options, then we have to work within those imposed limitations. And we go from there.

**DO:** *What is Audiofon all about as a label? What is the underlying philosophical bent?*

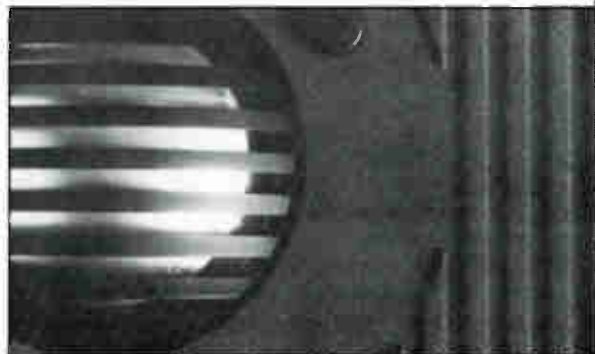
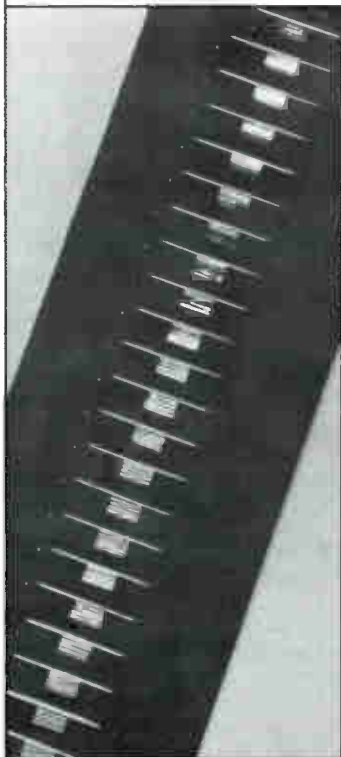
**PMcG:** It's clear that we specialize in the piano world. Of the 28 or so titles we've brought out, I think over 20 are of piano music. If I were to describe the philosophy of the company, it is to right some wrongs, so to speak. We have some very strong feelings about some of the pianists we've worked with and how they and their repertoire have been generally ignored by the larger companies. Also, one of our credos is to provide a very comfortable environment in which to make and record the music. For example, we released a recording of Leonard Shure doing the "Emperor" Concerto, conducted by Leon Fleisher. Now this is a pianist who, if I'm not mistaken, has never



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**DO:** *Why the emphasis on piano?*

**PMcG:** Well, that's a *misbegas* of my partner Julian Kreeger, and one that I've absorbed by osmosis. Julian is simply nuts about piano. And about all music, but particularly pianists. I went along with it, and now I share the same kind of fascination. My ambition in life is to record the definitive 106, the definitive "Hammerklavier"; I don't know with whom yet. The definitive one for me on record now, and the one to beat if it's possible, is the Solomon recording. I've listened to some of the newer Johnny-come-latelys, and it's just dismal. I don't know who in the piano world out there is capable of playing at anywhere near that level.

**DO:** *Maybe we'll have some volunteers out there.*

**PMcG:** I don't know who. I've mentioned it to David Bar-Illan, who's now living in Israel, and David said, "Well, if I practice, practice, practice, maybe!" One of these days. . .

**DO:** *You mentioned digital a bit ago, and you even mentioned CDs without making any faces! But I have the impression that you're not too enamored with digital.*

**PMcG:** Well, as a recording process, I really think that a distinction has to be made between what the consumer has to listen to at home, and what somebody in my position has to deal with in terms of having a shot at recording something and not being able to go back and do it again.

**DO:** *Well, let me clarify one point. You take the mike feed and record it onto the Stellavox. . .*

**PMcG:** . . . and I also record in parallel on digital. We have been using the PCM-F1 for years now, which I've recently had modified with Apogee filters, *et al*, by Jeff Rowland of Rowland Research, and they did a really nice job; it made a fairly substantial improvement to the sound in terms of phase, image, clarity, a little softening of the edge and the top end, a little improvement in the inner detailing and resolution.

The Apogee is the hot anti-aliasing filter right now, the filter that supposedly alleviates many of the A/D phase anomalies of digital processors. And they're now being offered for use in the Sony PCM-1630, which is the digital standard for disc mastering. Jeff took this device

*My ambition in life is to record the definitive "Hammerklavier."*

and, I guess, adapted it for inclusion in an F1. It's made a pretty big improvement, but even with that there is a fairly substantial gap between what's produced by that machine and the Stellavox.

**DO:** *To what kind of digital machines have you compared the Stellavox?*

**PMcG:** We've used Colossus, the Sony PCM-F1 with Apogee filters, the DAT 2500 Sony, the little Technics portable with the MASH circuit. I've used the JVC 900 series, and Sony 1610s and 1630s. There is a characteristic that seems to emerge to varying degrees, and that is that I would not, under most circumstances, describe the limitations that I hear in digital in the normal terms that most people use; *ie*, that it's harsh. For me it's simply a fundamental lack of resolution relative to what I get from analog. Or, indeed, relative to what I get off the direct mike feed.

**DO:** *It seems that you've given digital a fair chance; you've used the best there is.*

**PMcG:** Well, we've invested in it. I hope to receive by the end of this week a Sony DAT 2000, which is the new Sony portable machine; I'm looking forward to that. Not that I expect it's going to sound as good as my analog, but it's gonna be a joy to work with because it's the size of a bible. We'll have NTSC timecode capability. We'll have 48V phantom powering, and a very high-quality microphone preamp built into it. So for work that involves concert work and that sort of thing, I can, at a moment's notice, rush off with just a briefcase.

**DO:** *What did you think of the Colossus encoder? J. Gordon Holt and I were quite taken by a couple of Bainbridge CDs mastered on the Colossus machine.*

**PMcG:** Yes, I agree; the sound of that machine is the best of digital that I've heard. But in terms of the comparisons that we made, which are, again, the mike *vs* the analog *vs* the Colossus, it came up short relative to the analog. Not that far short, I might admit. We were using WATT speakers, a Spectral DMA 50 amp, and MIT cables, so we had a pretty good monitor system, certainly better than what is typical of

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most recording sites. We were able to switch oack and forth between the three. (We did this when we were doing the Mozart horn concertos with the Philharmonia Baroque Orchestra.) During rehearsals I would be running the three, and going back and forth. And after the mike feeds would stop, we'd then run the two tapes back and then AB the tapes to each other. Robina Young and I listened, as did several of the musicians. In the first comparisons it was very hard to discern, but then as they listened more and more, preferences clearly started stacking up in favor of the analog. But in previous comparisons with other digital processes, it had been, like, turn that off. It wasn't even close! Colossus did sound good, however. It is probably, given what is available right now, the digital medium of choice.

**DO:** *I'm not ready to quit on analog vs digital sound differences. I think that you're in a perfect position to comment on that because you're looking at a mike feed vs the analog master tape vs the digital master tape.*

**PMcG:** That's correct. With levels set and controlled.

**DO:** *You mentioned "digital death," the loss of detail resolution. Are there any changes in timbre, any balance changes?*

**PMcG:** There are changes in image.

**DO:** *In terms of the focus, or the size of the instruments?*

**PMcG:** Position of focus.

**DO:** *And that could very well relate to. . .*

**PMcG:** Phase.

**DO:** *Phase problems. What about timbre changes? It's a pet theory of mine that digital does somehow effect small timbre changes.*

**PMcG:** I think it does. I think that you cannot as readily identify the instruments for what they are. It's not bad, mind you, it's simply that there is a loss. And, as I say, a lack of resolution affects one's ability to as readily recognize what you're hearing. It's not the obvious things that most people think of such as harshness and grain that are a problem. In fact, frankly, if the caliber of my analog machine was not there, you would be quite pleased indeed with the sound that the digital is giving. You would accept that as a standard degradation of the integrity of the original recorded signal.

**DO:** *How much does a Stellavox cost these days?*

**PMcG:** I don't know. Goldmund has just bought the company, and will ultimately be

involved in its distribution. When I bought the machine, the dollar was very favorable against the Swiss franc; it ran about \$14,000. My guess is it's probably double that now.

**DO:** *\$20,000-plus vs a Sony PCM-F1 that can be had for about \$2000. How can I do any better than that for a couple of thousand bucks?*

**PMcG:** In terms of cost effectiveness, there's no argument. On the other hand, it's very beautiful and the sound I get justifies it. It also weighs a lot. I break my back every time I move the machine. I have a lot of very strong incentives to find a better digital recorder. I'm not advocating the superiority of analog based on some kind of archaism—if something comes along that is legitimately better, I'll be the first to admit it. But I've yet to hear anything that shakes my feeling that a good analog recorder is still the best medium.

**DO:** *So we're still looking for the ultimate digital recorder.*

**PMcG:** I think that it's not inconceivable that we'll find it soon. Mitsubishi has announced a new machine, the X-86 HS, which looks very exciting. It has a 96kHz sampling rate, it's open-reel—you can scissors- and tape-edit it. The only problem is that it's a mere \$45 grand and weighs over 200 pounds. And if you're going to disseminate the recordings on CD, you have to convert them back down to 44.1kHz. But at least your masters are good.

See, that's the beauty too, of my sticking with analog. For example, all those people who have recorded with a 1630—if DAT should ever take off, they're going to have to release DAT tapes that don't even achieve the potential of what DAT is capable of. I, on the other hand, can translate my analog tapes to 48kHz, as opposed to 44.1kHz—pick up another few bits and get a little more extension in the high frequencies, maybe push that digital brick-wall filter up a little bit further out of the way, and as a consequence have a sound that is a little bit better than what everyone is settling for now. That's been the problem with digital from the beginning: It's a finite medium. Maybe 10 or 20 years from now, when I'm long gone, someone's going to come up with something that's going to see further into my analog masters than I ever thought was possible. That may be a good or a bad thing. But take Richard Layton, for example: The irony is that people are enjoying his recordings today at a higher caliber and level than he knew he had made!

**S**

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# EQUIPMENT REPORTS

## SNELL C /II LOUDSPEAKER

Thomas J. Norton

Three-way, reflex-loaded loudspeaker system. Drive units: 10" woofer, 5" midrange, 1" soft-dome tweeter, 0.75" soft-dome rear tweeter. Crossover frequencies: 275Hz and 2700Hz at 24dB/octave, 15kHz (rear tweeter). Frequency response: 65Hz–20kHz  $\pm$ 1dB on axis, 34Hz–22kHz  $\pm$ 3dB on axis, 37Hz–15kHz  $\pm$ 3dB total radiated. Sensitivity: 88.5dB/W/m (anechoic). Nominal impedance: 8 ohms. Amplifier requirements: 20–250W. Dimensions: 46" H by 14.5" W by 11.75" D. Weight: 90 lbs each. Finish: Oak, Walnut, Black. Price: \$1890/pair. Approximate number of dealers: 130. Manufacturer: Snell Acoustics Inc., 143 Essex Street, Haverhill, MA 01830. Tel: (508) 373-6114.

It's not exactly a secret to long-term *Stereophile* readers that this reviewer had been favorably impressed by the Snell Type Ci loudspeaker (Vol.10 Nos.2 & 6). So when I wandered into the Snell Acoustics' suite at the 1987 Summer CES, my attention was immediately vectored away from the featured Type Q to an unfamiliar, three-way, floor-standing design lurking in the back of the room. Dubbed the Type "X", it was being promoted as an early version of a loudspeaker intended to sell for \$1600–\$1800/pair. I didn't need to be a rocket scientist to figure out that this was a possible replacement for the Ci. The "X" was intriguing, but it was also, clearly, an early prototype. It made use of what appeared to be the drivers from the Type Q for the midrange and high frequencies; a 10" woofer covered the bass.

My suspicions were confirmed at the next CES: the newest Type C, now dubbed the C/II, was formally introduced. It resembled the "X" in bold outline: three-way system, fourth-order (24dB/octave) crossover, 10" woofer in a reflex-loaded cabinet, 1" soft-dome tweeter, and  $\frac{3}{8}$ " rear-firing tweeter. It had been designed, as had the Q, with the aid of the latest spatial-averaging measurement techniques using the full-sized, anechoic chamber at the Canadian National Research Council facilities in Ottawa. Unlike the "X", however, the new C/II could no longer be described as a clone of the Q with added "sub" woofer. While its tweeters (front and rear) appeared similar to those in the Q, the midrange driver of the C/II was a new, 5" design quite different from the 6" midrange/woofer of the smaller Snell. The unique cabinet shape of the original C and the Ci also appeared to be history. The new model

abandoned the original's distinctive, sloped upper cabinet in favor of a more conventionally shaped, rectangular column. But it retained the general size and proportions of the earlier design. It also retained the latter's bi-wire option.

When our review samples of the C/II arrived, other significant features became evident. Borrowed from the Q was a non-diffraction grille design, intended to be left in place during use. (All the auditions were, therefore, conducted with the Snells fully clothed.) Spikes were also furnished.<sup>1</sup> And although the C/II appeared very well built, the black finish on the review samples was disappointingly blotchy—not at all typical of the high quality I have observed in Snell's other, natural wood finishes.

I approached my evaluation of the C/II with mixed emotions. I had been favorably impressed by its sound quality at CES, but would it be a worthy replacement for the Ci? The Type C may have been getting a bit long in the tooth, but the Ci redesign had converted it into a rewarding loudspeaker, with a well-defined soundstage and convincing reproduction of large musical ensembles. I had, in fact, come very close to purchasing the review pair, but declined for reasons having nothing to do with their sound quality.

I began auditioning the C/II's by setting them up in the location previously occupied by the B&W 801s: firing across the short dimension of the room and well removed from the rear and side walls, toed-in toward the listening position, and "mono" wired with Monster M-1 cables. An audiophile friend of long standing

<sup>1</sup> I used three Tiptoes per loudspeaker instead—leveling is automatic on three points, but a real hassle with four.

was in town and participated in these early sessions. His opinions on sound quality often (though not always) parallel my own. We both agreed on the essential character of the sound, noting particularly the open, spacious quality, and the well-balanced, uncolored midrange. My friend had found the midrange of the 801s a bit too forward (I agree, though I am by now accustomed to it and do not find it distracting) and much preferred the balance of the Snells. The 801s had, we both agreed, the better bass, deeper in extension and somewhat better defined from the lowest reaches up through the midbass—without the aid of B&W's bass equalizer.

The high end of the C/II, however, troubled us. My friend commented that the Snell's soft-dome tweeter sounded metallic—an ironic observation since the metal-dome of the B&W did *not*. I agreed to the extent that I found an excessively bright sparkle to the treble. It was not, to me, particularly unpleasant, but neither did I find it neutral. We decided to experiment with loudspeaker cables. With a set of TARA Labs (not the latest, upgraded versions) substituted for the Monsters, the brightness seemed to shift upward slightly in frequency, but the bass became less well-defined. A reasonable solution suggested itself: use the TARAs on top and the Monsters on the bottom in a bi-wire configuration. We tried it, and it appeared to provide a noticeable improvement over the use of either cable by itself.

I was still not totally convinced that the balance was quite right. The above listening sessions were rather brief—two short sessions on successive evenings. LA, JA, and DO were also in town, and on the third evening they dropped by for a listen. It was obvious that the high end was still problematic, along with a degree of leanness in the upper bass/lower midrange. The latter had not bothered me greatly; I tend to be more tolerant of too little midbass than too much. JA was seated in the sweet spot and remarked favorably on the spacious quality. LA, sitting well off-axis, was bothered by the consistently bright quality. His listening position placed him out of the direct sound from the loudspeakers and well within the reverberant field—which, in my room, *is* somewhat bright. But even from positions near the sweet spot, the high end was prominent and the balance lean. Most of these observations were made without the use of the rear tweeter (a switch on



**Snell Type C/II speaker**

the rear panel provides for this option).

A couple of days later, after all the guests had left town, I sat down for some serious solo auditioning. That brightness was still evident; further experimentation with the setup definitely appeared to be advisable. I began by returning to the mono-wired Monster M-1 cabling, but this time I removed the Terminator banana plugs and hooked up the spade lugs directly to the loudspeaker and amplifier binding posts. I also replaced the short lengths of bare, solid wire provided by Snell to jumper

the upper- and lower-range bi-wire terminals (when not using bi-wiring) with short lengths of Apature cable. The net result was, I felt, a definite improvement (despite my earlier, positive observations on the TARA/Monster bi-wire hookup—which had been based on a rather brief audition). The upper highs seemed a bit less emphasized, though the upper midrange, lower treble still had too much output—tolerable on recordings with a soft high-frequency response but emphasizing the edge inherent in too many otherwise good recordings. I wouldn't describe the quality as in any way hard or peaked, but my attention was drawn too often to the upper-frequency detailing at the expense of total sonic integration.

I next repositioned the C/II's to face directly forward instead of toeing them in toward the listening position. Judged from the sweet spot, the upper midrange/lower treble bite I had observed was notably reduced. Surprisingly, the quality of the soundstage improved significantly also, becoming more coherent and solid. The leanness observed in the earlier auditions seemed somewhat alleviated, but the C/II's could still not be described as warm-sounding. In my opinion, that is generally to their credit, but I decided to experiment further with placement, in hopes of generating a bit more sonic weight. I repositioned the cabinets to place them just over 2' from the rear wall. The listening position was moved forward to maintain the same distance from the loudspeakers. The result? The sound *was* fuller through the midbass, the balance a bit more neutral. But something had been lost. The soundstage was now less spacious. Depth and three-dimensionality were reduced. And although the midbass was fuller, the deep bass, surprisingly, was considerably less profound.

Other positions were tried, but I finally settled on the original setup—but with the speakers facing straight out. The low bass was undoubtedly enhanced in this location by the near-wall listening position required to maintain a comfortable distance from the loudspeakers. Such a listening position isn't generally ideal, but it's a position I have lived with extensively and provides, with many loudspeakers, the best compromise I have found in this room.

At last the preliminaries were dispensed with and serious auditioning could begin. Associated equipment used with the Snells, besides the cables already discussed, included the Krell

KC-100 cartridge and Well-Tempered Arm mounted on a VPI HW-19 Mk.II turntable (with new motor), Klyne SK-5a preamp, Levinson No.23 power amplifier, California Audio Labs Aria CD player, and Monster M-1000 interconnects. The Snells were also driven, briefly, by two other amplifiers, the PS Audio 200cxi and the Rotel RB 870BX.

Despite my extensive experimentation with placement and orientation, my attention continued to be focused on the highs; I kept wishing that they were just a bit less insistent. As I have already stated, the highs were not rough, irritating, or hard. They were, in fact, seductive on many recordings. But they were, for me, definitely on the bright side of neutral. Marni Nixon's voice on *Marni Nixon Sings Gershwin* (Reference Recordings RR-19) had a silvery sheen. The strings on *Oratorio Noel* (Proprius PROP 7857) were crisp, cool, and slightly grainy. James Galway and the Chieftains' *In Ireland* (RCA 5798-1-RC), normally a very warm, sweet-sounding recording, was short of these qualities. CDs fared somewhat better over the Snells than LPs (at least with respect to spectral balance),<sup>2</sup> but even with them I had reservations. Don't get the wrong impression: not all recordings, LP or CD, sounded overbright. But they did sound *brightened*. You might arguably expect a wide sample of recordings played over a neutral reproducer to sound anywhere from subdued to bright, depending upon the recording engineer's sensibility and the producer's desire for (or ability to resist) a *commercial* sound. The range of variation through the C/II's varied from neutral to noticeably tipped-up.

I have already commented briefly on a certain leanness in the Snell's midbass. It contributed to a lightening of sonic textures—male voices (solo and chorus) lost some of their natural body, large ensembles lacked a fully characteristic weight. Some of this was a result of the chosen placement, a deliberate trade-off which I've already discussed. Room-response measurements (taken at the listening position) showed a broad dip between 125Hz and 500Hz. These same measurements, however, failed to show any peakiness or rise in the high frequencies. So here we have perhaps a partial explanation for the C/II's subjective tendency to brightness—a midbass depression, at least

<sup>2</sup> The Krell KC-100 has a slight HF rise, though far less than many moving-coils.

somewhat position-dependent, in a frequency band responsible for much of the sonic power of most program material. I don't believe, however, that the C/II is entirely off the hook. Even with the 2' spacing from the rear wall (which removed much of this upper bass/lower mid-range dip), I still had reservations about the top-end balance.

In a final system-configuration change, I tried substituting an old set of Monster Interlink Reference A's for the M-1000s connecting the preamp and power amp. I have found the A's in the past to be sweeter but less open and detailed than the M-1000s. With the Snells, the change was definitely worthwhile. The additional softening, while it did not entirely settle my reservations, definitely mitigated the tendency of the C/II's high frequencies to call attention to themselves.

None of the above machinations would have been worth much in a lesser loudspeaker, but it had been apparent from the first that the C/II deserved the effort. Beyond my concerns about the new Snell's balance, the remainder of my sonic impressions fell solidly on the positive side of the ledger. For this reviewer, the major strength of the C/II is its excellent soundstaging, providing a dramatic sense of the performing space. The Snell is not a "small"-sounding loudspeaker. Instruments and voices were spread wide and deep between and (occasionally, though not often) beyond the loudspeakers. There was more than a hint of the expansiveness that is the most compelling quality of omnidirectional loudspeakers—but with the Snells the resulting ambience remained that of the recording site, and the imaging remained precise. The sound was spacious and open—not in any way "closed-in." This quality was not present on *every* recording (if it were it would merely be a pleasant coloration), but was particularly evident on those made in natural, ambient environments. It was obvious, for example, on every Proprius choral recording I sampled. It was also quite striking on the *Antiphone Blues* CD (Proprius PRCD 7744), a rather odd but effective pairing of saxophone and organ in a highly reverberant church. The spaciousness here was stunning. Nor was that openness bought at the price of other soundstage characteristics. Properly positioned, the C/II's presented a tightly defined image and a convincing sense of depth and three-dimensionality. In the introduction to Act 3 of Puc-

cini's *Tosca* (von Karajan's superb 1962 recording, engineered by John Culshaw: London 421 670-2), a shepherd sings in the distance as he moves across the soundstage, following which church bells are heard at left, right, and points between. All of this was precisely defined, both in width and depth, through the Snells, contributing dramatically to the sense of atmosphere.

On Cyndee Peters's *Black is the Color* (Opus 3 77-06), the individual handclaps on "Plant My Feet" were properly located in space. And on *Dafos* (Reference Recordings RR-12 CD), the reverberation of the drums off the rear studio walls was sharply defined. In short, on recordings which were inherently capable of producing a good soundstage, the C/II did not disappoint.

Aside from the mid/upper bass leanness noted previously (which overlaps the extreme low end of the midrange to some extent), the midrange of the C/II was notable for its superior detailing and lack of obvious colorations. Midrange perspective was neutral. If I have any criticism it would have to be of a certain lack of power and weight in the reproduction of brass. In this it has a lot of company; proper reproduction of orchestral brass requires immense amounts of uncompressed acoustical power. I haven't yet found a loudspeaker which can do it full justice; when I do you'll be the first to know.

A casual audition of the Type C/II with program material having modest bass content gave little hint of the Snell's true deep-bass quality. Most of the time its sound resembled that of a small monitor. That is not meant as a criticism. The reflex-loaded C/II simply refused to sound fat or underdamped. With appropriate program material, however, I was left with little doubt about its low-frequency capabilities. True, it did not extend into subwoofer territory; rolloff began below about 40Hz, but with usable output significantly below that. It may not have been able to shake the walls in the lowest octave, but the lowest reaches of all major instruments—except for those of organ and synthesized bass—were there. Yet even organ could be quite convincing. The Rufatti at Davies Hall in San Francisco, as heard on Saint-Saëns's Symphony 3 in c (Philips 412-619-2, CD) was deep, open, and expansive—not quite window-rattling, but not far from it either. Widor's "Allegro," which fills out the same disc, was

even more impressive.<sup>3</sup> Both pieces demonstrated the Snells' notable lack of muddiness throughout the bass range.

The *Willow* soundtrack (Virgin Records America, 7 90939-2, CD) was brought to my attention during a Wilson Audio demonstration at the recent Winter CES (and was mentioned in my show report in March). What it lacks in subtlety and natural sonic perspective (and musical originality—James Horner may be a fine film composer, but Prokofiev also deserves a great deal of credit here), it more than makes up for in sheer sonic spectacle, low-frequency reach, and dynamic impact. It also has surprisingly good soundstaging, choral work, and inner detailing. To date I have only heard it over two loudspeakers, the Snell Type C/II in my own listening room and the Wilson WAMM at Winter CES. I'm not going to claim that the Type C/II is a mini-WAMM, if for no other reason than the different listening conditions under which I have heard the two systems. I will say that Snell's newest loudspeaker did not embarrass itself trying to do justice to this recording. The dynamics were startling, the low-frequency response powerful, deep, and taut, the soundstage convincingly three-dimensional. I wouldn't choose this recording for after-work relaxation or my desert island collection—it's simply too intense—but through the Snells it was an impressive experience. Play it for your friends for the aural equivalent of being run over by a Mack truck.

Up to this point I have only touched on the use of the rear tweeter in the C/II. It is intended, apparently, to smooth the power response at high frequencies, compensating for the natural HF off-axis rolloff of even the best tweeters. I found that it added a noticeable graininess (except on recordings having a very soft HF response) which did not enhance the overall realism of the sound. The situation might be different in a different environment; fortunately, it can be switched off. I had a similar reaction to the rear tweeter in my review of the Type Q (Vol. II No. 6).

I've already hinted at how the Type C/II compares with the B&W 801 Matrix Monitors. The B&Ws have a deeper, more powerful low end, but seem to perform at their best in a large room. The Snells, on the other hand, might just

be better suited to a smaller room than my own; they seemed well matched to the modestly sized listening rooms at CES. The two loudspeakers are comparable in imaging. The B&Ws edge out the Snells in depth and three-dimensionality, the Snells excel in spaciousness and expansiveness. The B&Ws are a bit too forward through the midrange, but have the more subtle, well-integrated highs. I also found that the Snells were 2.5dB more sensitive than the 801s—a significant reduction in amplification requirements.

Considering the price differential, however, comparing the B&Ws with the Snells is not entirely fair. How does the Snell compare with other loudspeakers in its price range? I have only one such product on-hand, the Mitek ZSE 380, but will save my commentary on that loudspeaker for its imminent review. I have, however, used Snell's earlier Type Ci for an extended period in the same room, though with slightly different associated equipment. Comparing two loudspeakers over a time span of more than a year is tricky at best, so I'll have to stick to generalities. The earlier loudspeaker had a less tight (though a bit more extended and powerful) low end and a less open, less detailed midrange. But it also had a less prominent high end and a more subtly layered soundstage. I was certainly a fan of the Ci, but would not give you an argument if you insisted that the new C/II is, on balance, a less colored reproducer.

Impedance measurements indicated nothing about the C/II which should make it difficult to drive. The impedance dropped to a minimum of 4 ohms around 100Hz (94Hz, to be precise), and again at about 15kHz (with the rear tweeter switched on—with it off, the impedance at 15kHz exceeded 7 ohms). I also noted when making these measurements that the rear tweeter, when in use, produced an audible output down to below 5kHz.

It should be clear by now that the choice of associated equipment will be important with the C/II—not that it's ever trivial. Avoid moving-coils with excessive HF output. Choose your electronics carefully; I found that the PS Audio 200cx, with its lean midbass and open but slightly bright highs, did not lock in as well with the Snells as it had with the B&W 801s. The more full-bodied Levinson proved a better match. Note that I am not implying that modestly priced electronics will be unsuitable for

<sup>3</sup> Widor seems to have written much of his music with woofer testing in mind.

the C/II. I have not, for example, heard the B&K ST-140 with these loudspeakers, but from the former Cheapstake's (now Anarchist's) descriptions of the sonic character of that amplifier, I suspect that it and the C/II would be a combination worth trying if a megabuck amplifier is not either in your home or in your future plans.

The Snell Type C/II is a loudspeaker which, in the right circumstances and in the right system, might just be your cup of Lipton's. I'd venture to say that I'm generally as tolerant of a bright HF balance as anyone on the staff of this

magazine, but even at its best I kept wondering how the Snell would sound with just a bit more sweetness in its high end. Not much, mind you—I wouldn't want to lose that sense of spaciousness, air, and upward extension which are among the Snell's more appealing strengths. Even as it stands, the Type C/II has plenty going for it. I cannot quite recommend that you dash down to your nearest Snell dealer, wild-eyed and waving money. I *do* recommend that you walk on in and give it a thorough, thoughtful audition. **S**

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## THOROUGHBREDS

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### John Atkinson reviews new versions of established loudspeakers from Vandersteen and Celestion

**Vandersteen 2Ci:** three-way loudspeaker with sub-bass "Acoustic Coupler." Drive-units: 1" critically damped textile-dome tweeter, 4.5" plastic-cone midrange unit, 8" plastic-cone woofer, 10" paper-cone sub-bass driver. Crossover frequencies: 500Hz, 4.5kHz (6dB/octave slopes); Acoustic Coupler takes over below 35Hz. Frequency response: 32Hz–17.025Hz  $\pm 1.5$ dB, 28Hz–20.125Hz  $\pm 3$ dB. Dispersion:  $\pm 3$ dB, 29Hz–16.125kHz, 90° off-axis. Sensitivity: 88dB/W/m (pink noise). Nominal impedance: 7.8  $\pm 1$  ohms 100Hz–20.125kHz. Amplifier requirements: 40–160Wpc. Dimensions: 36.5" H (43.5" including Sound Anchor stands) by 16" W by 10.25" D. Weight: 58 lbs each. Price: \$1195/pair not including stands (matching Vandersteen stands cost \$125/pair; dedicated Sound Anchor stands cost \$220/pair). Approximate number of dealers: 90. Manufacturer: Vandersteen Audio, 116 West Fourth Street, Hanford, CA 93230. Tel: (209) 582-0324.

**Celestion SL600Si:** two-way, sealed-box loudspeaker with Aerolam (metal-honeycomb) enclosure. Drive-units: 1.25" copper-dome tweeter, 6.5" Kobex-cone (PVC) woofer. Crossover frequency: 2.3kHz, second-order, 12dB/octave slopes. Frequency response: 60Hz–20kHz  $\pm 3$ dB, low-end, –6dB at 60Hz in free space conditions. Sensitivity: 82dB/W/m. Nominal impedance: 8 ohms. Amplifier requirements: up to 120W on program. Dimensions: 14.5" H by 7.75" W by 9.25" D. Enclosure volume: 12 litres (0.4 cubic feet). Weight: 11.25 lbs each. Price: \$1999/pair not including stands (matching SLSi stands cost \$300/pair). Approximate number of dealers: 80. Distributor: Celestion Industries Inc., 89 Doug Brown Way, Holliston, MA 01746. Tel: (508) 429-6706.

Following my reports on 13 mainly inexpensive loudspeakers that have appeared in the last four issues of *Stereophile*, I thought I would give myself a treat this month by reviewing the latest incarnations of two models that have stood the test of time: Vandersteen's 2Ci and Celestion's SL600Si. An interesting pair, I'm sure you will agree, as they represent to a T the prevailing design philosophies in their countries of origin. Both benefit from high-quality speaker stands, in fact both *contributed* to the development of such stands by demonstrating the need for them. Both are equipped, and intended, to be used bi-wired or bi-amped. But from there on they differ. The three-way

Vandersteen uses apparently relatively conventional drive-units. It achieves an extended bass response through use of a variant of reflex-loading, and features careful time-alignment of the drive-units, first-order crossover slopes, and polarity-correct driver connections in order to achieve optimal time-domain performance. On the intended listening axis, the speaker should present waveforms with their shapes preserved. The two-way Celestion, on the other hand, is a carefully tuned infinite-baffle design, sacrificing ultimate extension for upper-bass and lower-midrange quality. Its crossover is conventionally British in that it puts flatness of on-axis amplitude response

ahead of time coherence, while everything about it, from drive-units to the cabinet itself, is flagrantly "high-tech."

The strange thing is that when it comes to performance, the two models actually approach each other from opposite ends of the design spectrum. But I precede myself.

Each pair of loudspeakers was carefully positioned for optimal performance sitting on their own stands, coupled to the floor beneath the rug with spikes. Amplification was provided by either a pair of VTL 100W Compact mono-blocks or a Krell KSA-50 power amplifier, each bi-wired with Monster M1 speaker cable. The preamplifier was either the combination of the Mod Squad Line Drive Deluxe AGT and Vendetta Research SCP2 phono preamp, or the Conrad-Johnson PV9 (also reviewed in this issue). Source components consisted of a 1975-vintage Revox A77 to play my own and others' 15ips master tapes, a Linn Sondek/Ekos/Troika setup sitting on a Sound Organisation table to play LPs, and the new Philips LHH-1000 two-box CD player, its transport section also used to drive the Sony DAS-R1 D/A convertor. Interconnect was AudioQuest LiveWire Lapis.

Each speaker was submitted to the following measurement schedule: The voltage sensitivity was assessed with  $\frac{1}{2}$ -octave pink noise centered on 1kHz, while the change of impedance with frequency was measured using spot tones.<sup>1</sup> The nearfield low-frequency response of each speaker was assessed with a sinewave sweep to get an idea of the true bass extension relative to the level at 100Hz. The frequency response of each speaker in the listening area was measured using pink noise and an Audio Control Industrial SA-3050A  $\frac{1}{2}$ -octave spectrum analyzer. Nine sets of six averaged measurements were taken independently for left and right loudspeakers at a distance of just over 2m in a window 72" wide and varying from 27" to 45" high. The response shown in each review is the average of these measurements, weighted slightly toward the sound heard at the listening position. This spatial averaging is

1 It has been worrying me for some time that while my impedance plots are the right shape, the absolute values differ slightly from the manufacturer's specification and from those published in other magazines. In particular, speakers reach a slightly higher impedance value at their LF resonance, though this itself is not changed in frequency. After considerable head-scratching, the acquisition of some even-higher-precision calibration resistors than I used before, and the purchase of a new Fluke 87 true-RMS multimeter, I can only conclude that it must be the effect of the reduced air pressure here in 7000'-high Santa Fe.

intended to minimize the effect of low-frequency room standing-wave problems (below 500Hz or so) on the measurement, and gives a response curve that has proved to predict reasonably well what is heard; it also gives an idea of the off-axis behavior of the speaker under test.

In addition, for these tests, I captured the impulse response of the speakers using a PC-compatible, 8-bit Heath/Zenith digital storage 'scope. This enables up to 250 separate "snapshots" to be averaged, which (as long as the time relationship between the trigger pulse and the captured pulse is constant, within one sampling period) usefully increases the S/N ratio. The 'scope communicates with the computer via its RS232 port, the computer then controlling the 'scope's settings via "soft" keys. The waveform can be stored on disk as a 512-point ASCII file, which thus enables the user to carry out various mathematical operations on the data. Accordingly, I wrote an FFT program in Microsoft's Quickbasic 4.5 language,<sup>2</sup> which takes about two minutes to calculate the equivalent anechoic response of the speaker from the impulse data file.<sup>3</sup> (The measurement window was 10ms, it being assumed that the impulse has died away to zero by this time,<sup>4</sup> and I arranged the position of the speakers so that any reflections of the pulse from room boundaries would arrive after this period. The trigger to the 'scope was a delayed twin of the analytical pulse, the delay time approximately arranged to coincide with the transit time of the sound from speaker to measuring microphone. In addition, use of a 10ms window results in a sampling frequency of just under 51.3kHz, minimizing audio-band aliasing.)

2 To those laymen like myself who find themselves interested in FFT techniques, I found Ronald Bracewell's *The Fast Fourier Transform and Its Applications* (McGraw-Hill) to give a usefully thorough exposition of the theory. The appendix to Williams's and Taylor's *Electronic Filter Design Handbook* (Second Edition, McGraw-Hill) was also of help. I will happily send a copy of this program (on 360k, 5.25", or 720k, 3.5" MS-DOS diskettes only) to anyone interested. Please send a 6" by 9" self-addressed envelope, and \$10 to cover the cost of the blank diskette, handling, and postage. (Checks should be made out to *Stereophile*.)

3 So much toil to end up with the DIY equivalent of Julian Hirsch's IQS FFT analyzer! I have always believed, however, that the heuristic approach is the best way to gain an understanding of how test equipment works. You can then appreciate its limitations when faced with the real-world task of coping with the foibles of music reproduction systems.

4 This may be an unjustified assumption. I will be trying various shaped windows, such as the Hamming, which imposes a raised cosine amplitude function on the windowed data, in future tests.



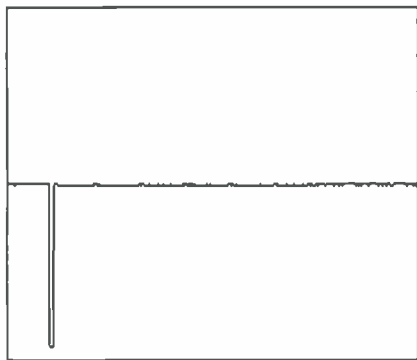


Fig. 1 55 $\mu$ s test pulse (5ms window)

I have included these responses in the measurement sections of the reviews, but note that I have only plotted the range—from 200Hz to 10kHz—where the calculated responses have proved to be repeatable within 0.25dB or so. (To cover the entire audio spectrum, a unidirectional square pulse needs to be of no more than approximately 20 $\mu$ s in length; the pulse I was using, shown in fig.1, was unfortunately 55 $\mu$ s long, curtailing the accuracy of the measurement in the top audio octave. Note that the pulse used has inverted polarity: this is due to the inverting line stage of the Conrad-Johnson PV9 preamplifier used for these tests. A 20 $\mu$ s pulse generator is on the way, as is a math coprocessor chip. Note also that a 10ms window means that you are stuck with 100Hz resolution: midrange peaks and dips due to resonances and interference that are narrower than this will be lost. On the other hand, going to a 20ms window, say, if the room were large enough and the speaker far enough above the floor, would halve the measurement bandwidth with only 512 data points. A case of swings and roundabouts, I guess.)

### Vandersteen 2Ci: \$1195/pair

Vandersteen's Model Two loudspeaker was introduced in 1977 and in one form or another has remained a bestseller since then. Along with KEF's R105, also launched in 1977, the Vandersteen Model Two was one of the first loudspeakers to feature minimum-area, carefully profiled baffles, optimizing lateral dispersion and eliminating the effects of diffraction from the baffle edges.<sup>5</sup> The 2C has been the subject of a program of continuing improvement, Vandersteen being one of the first US

companies to invest heavily in FFT and TDS measurement techniques. In its last incarnation, the 2C which first appeared in 1984, the speaker was very favorably reviewed by Anthony H. Cordesman in *Stereophile* Vol.9 No.6. The latest Ci version features an improved midrange unit, but is otherwise very similar in its general design philosophy.

One factor in the speaker's success has been the fact that the Vandersteen purchaser gets a lot of loudspeaker at the price, and a reason for that must be the unusual styling. Apart from the oiled-wood-veneer top and bottom caps, the entire speaker is surrounded by a black jersey-cloth "sock," held into a conventional rectangular form by four 1/4" rods that form the speaker's "corners." The enclosure proper can thus be just painted black, allowing the money saved on veneer to be spent on the things that count—those that produce the sound!

Underneath the sock, rigidly fixed between the rods by the bottom panel and horizontal braces, is an asymmetrical bass enclosure, 23" or so high and 13.5" wide at the rear, tapering to just over 9" at the front, which is only just wide enough to carry the woofer. This driver is constructed on a diecast basket and features a conventional half-roll surround and an 8" curvilinear cone fabricated from a plastic material termed by Vandersteen "polycone." At the enclosure's rear is a large, 10" actively driven pulp cone, this the "Acoustic Coupler" and mass-loaded with what appears to be a wooden disc over its dust cap. On the top of the bass bin is fixed the small, 6"-wide enclosure that carries the 4.5" plastic-cone midrange unit. This sub-cabinet is slope-fronted to bring the acoustic center of the driver in alignment with that of the woofer. The midrange drive-unit is also constructed on a diecast basket and is cooled with ferrofluid. It has an unusual surround, this flat rather than the usual half-roll, and a result of the research program that resulted in the sophisticated midrange driver featured by Vandersteen's 4A loudspeaker. It is said to better absorb traveling waves in the cone material. The final driver is a 1", ferrofluid-cooled fabric-dome tweeter, mounted in another small enclosure on top of the one for the midrange and surrounded by a blanket of felt that reaches as far as the frame of the midrange driver. Along

<sup>5</sup> See Ken Kessler's interview with Richard Vandersteen in Vol.11 No.6, June 1988, for the full background of this design.



with the fact that all the front edges of the baffles are radiused, this will lower the level of interfering reflections from obstructions in the tweeter's acoustic environment.

All the cabinetwork is constructed from "Multi-Fiber," a wood product said to be more dense and stable than particle board, and resonances are said to be sufficiently well-controlled that they cancel rather than become additive. Electrical connection is via two pairs of



#### Vandersteen 2Ci speaker

4mm sockets on a rear panel, one for the woofer/acoustic-coupler combination, the other for the mids and highs, next to two wirewound pots that offer a degree of control over mid-range and tweeter levels. (I would recommend the 2Ci owner rotate these over their full travel a few times every couple of months to ensure that the electrical connection between wiper and track remains good.) The crossover is constructed on a double-sided Mil-Spec printed circuit board and features first-order slopes. Audiophile-quality components are used throughout, including air-cored inductors and polycarbonate, polypropylene, and *IAR* capacitors in the signal path; *IAR* Wonder Solder is used exclusively. The crossover includes phase- and impedance-compensating networks to minimize the change of impedance with fre-

quency, thus presenting the amplifier with a basically resistive load.

**The sound:** Each 2Ci was attached to the dedicated stand produced by Sound Anchor of Florida with two bolts, the actual contact between speaker and stand being via three small ball-bearings which fit into recesses in the stands' top pieces. These triangular stands are impressively solid, and even though Richard Vandersteen says that the less expensive Vandersteen stands give 95% of the Sound Anchors' sonic performance, I would urge 2C owners to go the whole hog.

In their excellent and informative handbook, Vandersteen recommends placement of the speakers parallel to the rear wall and at least 12" away from it, with the side walls at least 24" away. After some experiment, the speakers were positioned some 24" from the rear wall, 60" from the side walls, and some 6' apart, firing straight ahead. The side walls to the front of the speaker are basically dispersive rather than reflective, being faced with bookshelves. Due to the time-coherent nature of the design, the vertical listening axis is very important. With the 2Ci raised some 6–8" above the floor by its stand, the listener's ear must be between 35" and 39" off the floor. If that is not the case, then the stand spikes must be adjusted to bring the listener on to the optimal axis. As indicated earlier, the speakers were used bi-wired with Monster M1. Vandersteen recommends that all the speaker cables must be the same length and type, so I resisted the temptation to mix'n'match. I still wasn't ready to do any serious listening, Richard Vandersteen having informed me that the 2Ci needs to be broken in for at least 50 hours. This is primarily, I understand, to bring the surround on the midrange driver to its optimal compliance. I ran pink noise overnight at a moderate level through the speakers for three nights or so, and used them for background music while I cranked out copy for last month's issue of *Stereophile* on the Toshiba lap-top.

Finally! With the April issue gone to bed, I could get down to some serious listening.

My first impression, not changed by any later experience, was that the 2Ci is one hell of a fine speaker at its price. Particularly impressive was the generous extension to the bass, double-bass and organ pedals having true weight to their sound. A current "hot" organ recording

I feel to be that of the Bach *Goldberg Variations* on Dorian (DOR-90110). The 2Ci reproduced the full weight of this modern French organ—great reed stops—without blurring any of the spatial definition so well captured by recordist Craig Dory. And the contrabassoon on Tony Faulkner's recording of the Dvorák *Serenade for Winds* in d (ASV COE 801) was delightfully fruity. It seems that Richard Vandersteen has achieved that chimera of modern speaker design, the optimal balance between low-frequency extension and upper-bass clarity. And, again, in a \$1200/pair model! Anyone selling a speaker more expensive than the 2Ci is going to have to achieve great things in the other areas of reproduction to justify the price if its low end is less well-extended.

At the opposite end of the musical spectrum, the treble balance with the contour controls set flat was a little tilted down, lending the 2Ci somewhat of a "classical" balance. Raising the tweeter level with the appropriate control, however, revealed that the tweeter has a modest degree of liveliness in its top octave, adding a slight "ffffy" quality to sibilants. I ended up with the control set at +1dB, which added a suitable amount of air, without overemphasizing the tweeter's HF peakiness. I have to say that, given my unfortunate formative experiences with doped-fabric-dome tweeters, I never once was irritated by the Vandersteen 2Ci in this region during my entire auditioning. Maybe it's not so much the quality of the ingredients that go toward making a gourmet meal but the skill of the chef. . . ?

I understand that much of Richard Vandersteen's research effort has gone into the midrange drivers used in the 2Ci and 4A. Paradoxically, it was the midrange where I ultimately became a little dissatisfied with the 2Ci. Not that it was bad—if anything, it was still head and shoulders above most of the speakers in this price region—but I think this is the range where the compromises necessary to keep the 2Ci affordable have had most sonic effect. It was also apparent that the midrange voicing of the speaker is very dependent on the listening height. Move down even slightly, and the treble rapidly depresses in level; above the tweeter axis, the high treble is left isolated by a suck-out that develops in the bottom of the tweeter's passband. On the optimal axis, the best integration between the drive-units can be heard, though some 3kHz emphasis is audible, violin

tone taking on some added plangency. Brass instruments had the appropriate degree of blattiness, however, and drums and hi-hat cymbals reproduced with reasonably accurate tonalities, though there was a slight "cardboardy" coloration noticeable on snare drum. Crash and orchestral cymbals were also a little too splashy in the top octaves. Voices, both spoken and sung, came over as being very natural, men having the right balance between chest and throat, and women only occasionally sounded too dry, too throaty. Some sibilance emphasis was noticeable, however.

As so often is the case, it was naturally recorded piano that best showed up the 2Ci's slight midrange problems, with a degree of boxiness rendering the sound a little too small. The left-hand registers were beautifully defined, and the highs clean, with air around the image. The upper midrange, however, was pushed forward somewhat, there being less image depth apparent in this region, and the instrument sounded a little too reedy. And scale passages in my own Chopin piano recordings revealed some raggedness, some smudging of the notes F#, G, G#, and A both above the treble stave and an octave higher, these corresponding to the frequency ranges 740–880Hz and 1480Hz–1760Hz. Ultimately, I reduced the midrange level by 1dB with the contour control to minimize these colorations, piano then having less of a hooty quality on the problem notes, with a positive benefit on lower-treble image depth. Lower the midrange level too much, however, and the sound starts to lack immediacy. This balance has to be very carefully struck.

To put the levels of the colorations noticed into context, I only spend part of the auditioning deliberately listening for such tonal aberrations. With a good loudspeaker, they can be relatively easily ignored; for much of the time, the sheer musical sweep of the sound presented by the Vandersteens submerged such critical thoughts. Having noticed that, in absolute terms, the low treble was a little ragged when compared with the rest of the range to the slight detriment of recorded voice, didn't prevent me from reveling in such choral works as Arvo Pärt's *Passio* (ECM 1370/837 109-2), where processions of slow-moving, mainly diatonic chords, set off with delicious suspensions, are underpinned by a weighty organ. (My Christmas present from Richard Lehnert, this recording has spent a disproportionate

amount of time on the CD player this winter.)

One reason to forget the Vandersteen's minor tonal idiosyncrasies was its ability to throw a wide, deep, well-defined soundstage. While the lateral imaging precision was not quite up to the holographic standard set by the Celestion SL700 or the Rogers LS3/5a, there was never any feeling that individual images were clumped around the speaker positions. Using some copy master tapes of some of his crossed-figure-eight recordings loaned by Water Lily Acoustics' Kavi Alexander, I never failed to be struck by the natural size of instrumental images. And the details of different recorded acoustics—so big, so reverberant—were made easily decipherable. It was perhaps only in the presentation of ultimate depth that the Vandersteens were outclassed by, for example, the Celestion SL600Si, particularly in the midrange. One thing that may correlate with the time-coherent design philosophy is that I was consistently being struck by detail that I had not previously been aware of, even on recordings that I thought I knew well.

Finally, the 2Ci was a little polite at low levels, and only showed a good sense of dynamics when driven reasonably hard. It did go loud, however, and even the 50W Krell proved adequate to raise the listening-room roof, when necessary.

**Measurement:** Fig.2 shows the 2Ci's modulus of impedance with the contour controls set flat. The fundamental box resonance can be seen to lie at 88Hz and is well-damped, while the Acoustic Coupler tuning is an octave lower at 45Hz. Above the bass region, the impedance averages 8 ohms, though it does drop lower in the top audio octave and above. Coupled with its measured sensitivity of 90dB/W/m at 1kHz, the 2Ci should be pretty easy to drive, though tube amplifiers would probably work best

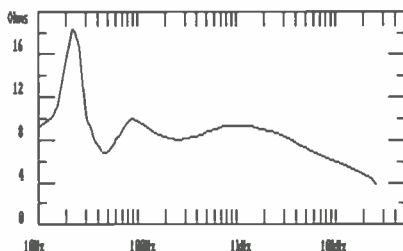
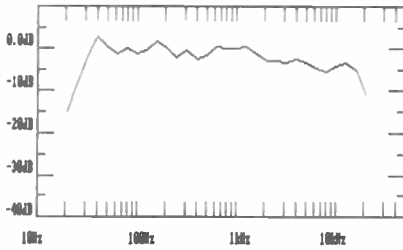
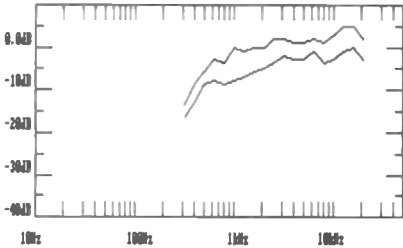


Fig. 2 Vandersteen 2Ci, impedance



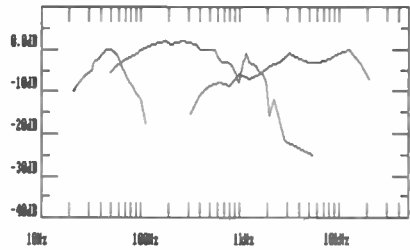
**Fig. 3 Vandersteen 2Ci, spatially averaged, 1/3-octave in-room response**



**Fig. 4 Vandersteen 2Ci, effect of tone controls (top trace: mid & HF at maximum, bottom trace: mid & HF at minimum)**

from their 4 ohm output taps. The spatially averaged in-room response, again taken with the tone controls flat, can be seen in fig.3. Relatively smooth, it shows a gradually sloping-down trend from the bass to the treble, relieved by a touch of looseness in the bass coupler region, some liveliness in the upper midrange, and a slight peakiness in the tweeter output around 13kHz or so. This latter characteristic is much more noticeable on the speaker axis; with the speakers firing straight ahead so that the listener sits significantly off-axis, it is hardly audible. Bass extension in-room is excellent for the size of the speaker, there being useful output down to the 32Hz 1/3-octave band. Vandersteen claims a wide horizontal dispersion for the 2Ci, and this was in general confirmed up to about 5kHz (for up to  $\pm 30^\circ$  off-axis) by the individual responses taken to derive the averaged result shown in fig.3. Above that frequency, the tweeter became increasingly directional. Listening off-axis can therefore be used to best optimize the tweeter balance without isolating the top HF octave, which is presumably why Vandersteen recommends firing the speakers straight ahead.

The effect of the two contour controls can

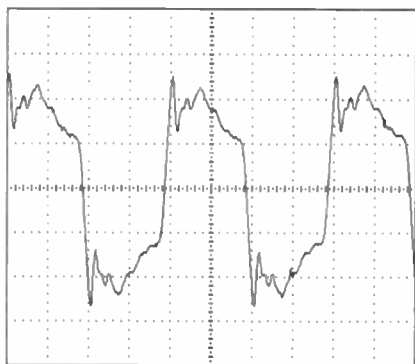


**Fig. 5 Vandersteen 2Ci, active bass coupler, woofer, mid/HF responses**

be seen in fig.4. The top trace is the response at 1m taken with both controls at their +2dB maximum; the bottom with both set at minimum (approximately -3dB). The midrange control offers a 6dB swing centered on the 1-2kHz octave, while the treble control swings the top audio octave by, again, 6dB. There is broad overlap in the 2.5-8kHz region, allowing the user to get a wide range of tonal variation to best optimize the speaker's treble balance to the listening room.

I found a touch of lift in the high treble (tweeter set to +1dB) to be necessary to counteract the speaker's slight lack of off-axis air; this has to be balanced, however, against exaggerating the excess of HF energy above 10kHz. Though this might then be thought to leave the midrange a little depressed, I nevertheless found -1dB on the midrange control to give the optimal balance between the need for sufficient high-midrange energy and not to unduly emphasize the speaker's uneven response in the same region. This will be different for every listening environment and system, however.

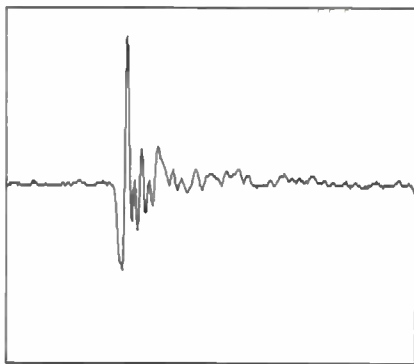
Fig.5 is a composite response, with the individual nearfield responses of the woofer and Acoustic Coupler superimposed on the response measured on the tweeter axis at 1m of the tweeter and midrange unit with the controls set as described above. The slightly over-damped woofer response will marry with the sub-bass radiator response to give an almost perfectly aligned bass alignment extending down to 28Hz, -6dB. This is exceptional extension for what is a relatively affordable loudspeaker. Despite the woofer/midrange crossover frequency being specified as 450Hz, it can be seen that there is a broad overlap for an entire octave above that frequency due to the slow roll-off rates chosen. In addition, the woofer can be seen to get peaky on-axis above 1kHz; although



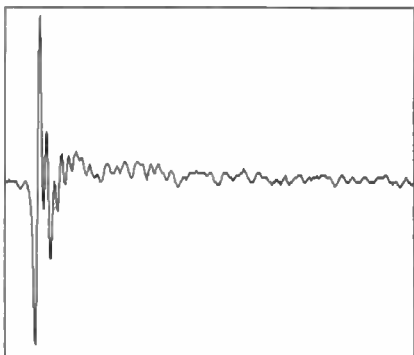
**Fig. 6 Vandersteen 2Ci, 500Hz squarewave response (5ms window)**

the drive-unit will be very directional in this region, minimizing its effect on the listening-axis response, it could well have contributed to the low-treble coloration noted in the listening tests. The on-axis bump in the tweeter's output can again be seen, as can a touch of unevenness in the midrange unit's output centered on 3kHz. This could be heard on pink noise as a mild "ssh" emphasis.

The design decision to use slow-rollout, first-order, 6dB/octave crossover slopes and to accept the broad overlap between adjacent drive-units is, of course, due to the fact that, when the acoustic centers of the drivers are physically aligned (as they supposedly are in the 2Ci), and when those drivers are connected in-phase, the result should be a time-coherent wavefront re-creation, with overtones arriving at the listener's ear at the same time as the fundamental. To investigate whether this was the case, I drove the speakers with a 500Hz squarewave and investigated the shape of the waveform on the listening axis; *ie*, about 15° off the lateral axis and with the mike approximately at tweeter height. Now with a conventional high-order crossover design with non-time-coincident drive-units, such as the Celestion SL600Si, it is impossible to get a square-wave reproduced as anything like a *square-wave*, due to the fact that the harmonics of the tone arrive at the microphone position at different times from the fundamental depending on their frequency. The best result I could find for the Vandersteen 2Ci at 1m (which is a little close) is shown in fig.6. As expected from the broad overlap between adjacent drive-units, this was extremely sensitive to vertical changes in position. But, it must be noted, it is quite a



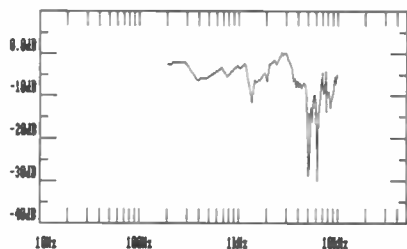
**Fig. 7 Vandersteen 2Ci, on-axis impulse response (5ms window)**



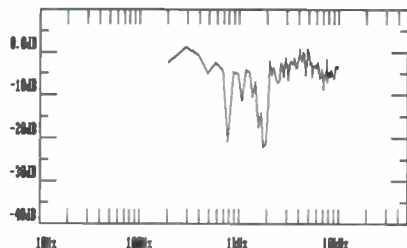
**Fig. 8 Vandersteen 2Ci, listening-axis impulse response (5ms window)**

good squarewave, with relatively sharp leading edges. The overshoot, which is presumably due to a damped resonance in the tweeter, can be seen to have a period just over one small division, corresponding to a frequency of around 7.5kHz. The fact that the individual outputs from the drive-units are still not quite coincident in time at the 1m microphone position is shown by the fact that the output of the fundamental from the woofer, with its slow rise-time, doesn't arrive until some 350 $\mu$ s after the tweeter.

Figs.7 and 8 show the speaker's impulse response, directly in front of the tweeter and on the 15° listening-position axis, respectively. (The time window shown is 5ms, the same as in fig.1, which shows the 55 $\mu$ s test pulse.) I find interpretation of these raw impulse responses to be fraught with difficulty. Therefore, apart from noting that: the initial polarity of the pulse is correct (remember that the stimulus was inverted by the PV9 preamp); the generally



**Fig. 9 Vandersteen 2Ci, on-axis FFT response**



**Fig. 10 Vandersteen 2Ci, optimum listening-axis FFT response**

time-coherent nature of the speaker is shown by the fact that a large proportion of the energy arrives within the first 200 $\mu$ s; and that there is some generally lively resonant behavior in the low treble, as shown by the ringing), I will quickly move on. Figs.9 and 10 are the anechoic frequency responses derived from FFT analysis of the impulse responses taken this time in a 10ms time window. (Remember that I am not confident of the response's repeatability below 200Hz and above 10kHz, hence the limited range shown.)

Fig.9, the on-axis response, shows a shape in the upper-midrange and treble similar to that in fig.5. Some peakiness around 1kHz, with a slight excess energy in a broad region centered on 3kHz, is coupled with a lack of energy in the crossover region to the tweeter. The sharp dips in the response centered on 1400Hz, 5250Hz, and 6400Hz are due to destructive interference, either between two drivers carrying the same signal or between the direct sound and its reflection from some nearby part of the speaker enclosure. I very much doubt that they will be audible, and in any case their exact position and depth is highly dependent on the microphone and thus the listening height. The two sharp peaks at 7200Hz and 7800Hz may correlate with the overshoot and slight ring seen on the

500Hz squarewave. Fig.10 was derived from the impulse response taken at a distance of 1m 15° off the horizontal axis—*ie*, on the listening axis—with the tone controls set to -1dB (mid-range) and +1dB (tweeter), which is how I did most of my listening. The response can be seen to be much smoother through the treble, though there is now a lack of energy in the *lower* crossover region, accentuated by two deep, narrow suckouts which, again, I assume to be interference phenomena.

If you feel that these plots show severe departures from a flat response, I must point out that that is not really the case. Such phenomena are very dependent upon the listening axis and are to be expected when a speaker has first-order crossover slopes. They represent the inevitable tradeoff the designer has to endure to arrange for time coherence (see the results for the Celestion SL600Si for a contrasting design choice). Their audibility is minimal; it's the broad trend that's important. In fact, I went into so much depth in measuring the Vandersteen 2Ci because it sounded so good that I wanted to see if there were any obvious indicators why.

**Conclusion:** I must say that I just don't understand how Richard Vandersteen can sell the 2Ci at a hair under \$1200 and expect to make any money. Always musical, with an easygoing nature that will match a wide variety of sources and amplifiers, it offers such a well-balanced mix of virtues, with no vices more severe than any other, that, along with the Thiel CS1.2 and Magnepan MG2.5/R, it redefines the level of performance that should be expected from a loudspeaker in the \$1100-\$1600/pair price region. Enthusiastically recommended, therefore, as an affordable loudspeaker for Everyman.

### **Celestion SL600Si: \$1995/pair**

It is almost six and a half years to the day that I first heard the prototype SL600, brought to my house in Sussex, England, by Celestion's then heads of engineering, Graham Bank (still with the company after a stint at Wharfedale), and marketing, David Inman (the latter now with KEF). The wooden-enclosure SL6 was the first dynamic speaker to have wooed me away from the old Quad ESL, its copper-dome tweeter at last enabling a moving-coil design to have some of the treble magic that is routinely bundled in with electrostatics. But then to hear, back in the Fall of '82, how the same drive-units could



Celestion SL600Si speaker

be made to produce a true high-end sound by replacing the SL6's conventional chipboard enclosure with one fabricated from aluminum

honeycomb, was a mind-blower. As soon as Celestion had solved the production problems associated with the new cabinet material—and there were *many* problems—the SL600 became my reference speaker of choice, surviving two house moves in the UK, one transatlantic translocation, two further changes of listening room in the US, and many, many, many system changes. Other speakers beckoned siren-like for a while, particularly the Magnepan MG2.5/R, Monitor Audio R952/MD, Acoustic Energy AE1, and Thiel CS1.2, but 1 kept on returning to the sound I liked the best.

And then, in the summer of '88, the '600 was replaced in my system—by Celestion's SL700, a speaker that finally made the old lady seem a little old-fashioned, even dowdy, by outdoing her in every area where she had previously starred, and adding higher levels of midrange and treble transparency to boot. My pair of SL600s went on to provide sterling service *chez* Olsher, where Dick used them for the sub-woofer survey that appeared in the January issue, and I enjoyed music via the upper-class '700s (between batches of review speakers).

While I waited for a pair of the newly revised SL600Si's to be delivered to Santa Fe.

Ostensibly, apart from a more granular matt-gray paint finish, the Si appears identical to the old '600. The rear panel, however, sports a whole new set of 4mm input sockets, two for the HF leg of the crossover and two for the bass/midrange, to allow bi-wiring or bi-amping. The second-order, 12dB/octave crossover has, in fact, been redesigned and now features star-earthing. (One of the factors that led to complaints from some UK critics—that the SL600 was congested in the midrange—was because the ground returns from the two drivers shared a pcb track.) The notch filter used to lower the amplitude of the tweeter's oil-can resonance has apparently also been redesigned, with better-quality components used.

The drive-units appear identical to those used in the older speaker: the 32mm copper-dome tweeter is formed in one piece with the coil former, the latter then acting as a shorted turn in the magnet gap to damp the driver's low-frequency resonance. The woofer, constructed on a diecast basket, is also a high-tech device, its flared PVC cone being developed with the aid of laser interferometry to ensure good piston motion throughout the driver's pass-band, the radiating area being said to decrease



smoothly with increasing frequency. There is no separate dustcap as such; the cone is of a piece with an inverted dome, this again determined, via laser interferometry, to be optimal.

The cabinet is unique to the SL600Si (and similar to the SL700) in being fabricated from a 0.5"-thick, metal-honeycomb aircraft flooring material. While low in mass, thus minimizing energy storage, it is sufficiently stiff enough for the resonances of its panels to be pushed almost two octaves higher in frequency than with a conventional wooden cabinet. The contribution to the overall sound from the flexing of the enclosure walls will thus be moved away from the region where instruments and voices have their energy maxima, and will also be lower in level. The result should be a low delayed-resonance signature, with correspondingly low levels of midrange coloration. Because the walls of the enclosure will now be virtually transparent to midrange sound, it is filled with carefully graded foam to absorb as much of the woofer's backwave as possible.

Like its predecessor, the '600Si can be extended with Celestion's stereo dipole subwoofers, the System 6000, to give a full-range speaker system that preserves the satellites' midband purity.

**The sound:** The first task was to assemble the matching SLSi speaker stands that Celestion supplied for the review. These are available in 18" and 24" heights—I used the 18" model for the auditioning, placing the listening axis just above the tweeter—and cost \$300/pair for either. A rectangular, extruded aluminum pillar, internally ribbed for torsional strength, is bolted to flat top and bottom plates. The pillar can be filled with whatever you choose to increase the stand's mass and damp its own resonant modes. Dry sand is an option, as is lead shot. As Celestion kindly provided lead shot, that is what I used, 37 lbs per stand. The final steps were to screw in the spikes and sit an SL600Si on top of each stand, putting some thought toward how the speaker's Aerolam enclosure should best be coupled to the stand. Celestion warns against the use of upturned Tiptoes or metal cones, which will penetrate the thin aluminum skin, instead recommending small pads of some non-reactive, resistive-damping material, such as the E.Z.Tak mastic material used to pin up posters and pictures (great value at \$1.59 for about 50 times the quantity you actually need from your local

Woolworth's). This is what I ended up using—without anything at all, the lower midrange noticeably thickens up, adding a "hooded" quality, particularly to female voice—but I should think that the thin Sorbothane sheet marketed by AudioQuest (\$12.50 from The Audio Advisor) would also be worth experimenting with.

One thing that has always been true for the best British loudspeakers is that they need plenty of room to breathe, and it applies to the SL600s in spades. Whereas the SL700s will put up with a relatively close rear-wall placement, usefully reinforcing the bass, the '600s need at least three feet's grace, in my opinion, if the sound is not to become too dark. But like the '700, the side walls need to be well away from the speakers' immediate environment. The precision of the stereo imaging that these speakers can produce is very sensitive to reflections that are spaced too close in time to the initial wave, the result being a considerable degree of image collapse. If your listening room doubles as the family room, it would be wise to consult your partner *before* you commit yourself to purchasing a pair of these Celestions.

Listening to a pair of speakers with just the tweeters connected reveals how little energy is carried by the HF driver. The Celestion SL600Si, for example, has just a wispy thread of sound reproduced by its tweeter, which leads almost to a feeling of puzzlement, even wonder, that improvements in the reproduction of this small wedge of musical information can have such a major effect on the sound. Yet it was the treble of first the SL6, then the SL600, that had convinced me of the fundamentally musically correct nature of metal-dome tweeters. Listen to the Hildegard of Bingen track on the *HFN/RR* Test CD, for example. At high levels with many—no, *most*—conventional fabric- or plastic-dome tweeters, the listener becomes uneasy as Emma Kirkby's voice rises in pitch as she nears the danger area in the crossover region, finally jumping up to back down the volume control as the tweeter is forced into aberrant behavior in its first octave. Listening to that track via the SL600Si's reminded me of the first time I'd heard this tweeter, back in 1981, for again, I found myself marveling at the complete absence of upper-midrange problems. Emma Kirkby's divine voice just soared, unbound by earthly resonances or any sibilance emphasis. And when it came to reproduc-

ing the sound of violin, unlike just about any other box speaker, the '600Si gets right the balance between midrange aggression and treble sweetness.

Yet this lack of upper-midrange coloration featured by the SL600Si revealed slight problems lower down in frequency, problems that might have been overlooked in a more earthly design. Particularly on piano recordings, a degree of sonic confusion, even slight congestion could be heard in the 500–700Hz region. While this coloration added to the speaker's sweet tonal balance, it nevertheless must be counted as a fault, and added a slight hardness in this region at high levels.

In the high treble, the HF was slightly depressed; but, more important, the sound lacked a little immediacy, suggesting a lack of energy in the presence region. It was for this reason that I ultimately changed back from the PV9 to the Vendetta/Mod Squad combination. Though the system sensitivity was now a little too low, limiting the ultimate loudness with the Krell, the sound was now usefully less dark.

The dark presentation was perhaps exacerbated by a lack of retrieval of ultimate detail. In the Hildegard track mentioned above, for example, the voices are smoother, more natural than on the Vandersteens. But the American speakers allow you to hear that a softly struck chime joins the regal in accompanying those voices. On the SL600Si's, the leading edge of the sound of that chime melds into the background drone.

The lows of the '600 have always been a favorite of mine. While Richard Vandersteen can show that fourth-order LF alignments needn't boom, a good second-order, sealed-box loading seems inherently to have a cleaner mid-upper bass presentation. My ultimate torture track to test speakers in this region is the 12" Huey Lewis and the News single, "The Power of Love." With the Krell driven to the point of clipping, it is astonishing to hear the clarity with which the Celestions can present kick drum, coupled with a suitable degree of weight. Bass extension is not as generous as with, say, the Vandersteens, but there is enough for 90% of most music's needs, even the Dorian *Goldberg* recording sounding sufficiently powerful and my own piano recordings having sufficient left-hand "purr." The transition from the SL600's upper-bass to the lower mid-range was always a little uneven, however, and the Si revision still seems a little lumpy here.

Male spoken voice, for example, was always too chesty.

It nearing Easter as I carried out the serious listening for this review, my musical diet became less secular—Richard Hickox's new recording of Elgar's *Dream of Gerontius*, the classic Wilfred Brown Finzi *Dies Natalis*, the Solti *Parsifal*, and a recording I haven't played for quite a long time, Neville Marriner's 1978 performance of the Bach B-Minor Mass on Philips (9500 412) with the Academy of St. Martin-in-the-Fields. I have no idea whether this is still available,<sup>6</sup> but it features great soloists—Margaret Marshall, Janet Baker, Philip Tear, Samuel Ramey—and I was privileged to attend a couple of the recording sessions, in London's church of St. John's, Smith Square. Over the Celestions, the sound was as naturally presented as I can remember—or imagine. It is easy to get used to a slightly blurred sound-stage presentation and accept that as the norm. But when you hear the vocal and instrumental soloists in a recording like this so delicately delineated in space—and a space that you recognize—and separated in depth from the choir and orchestra, you realize what you've been missing from even good loudspeakers. The scale of the music is small, it has to be admitted; this is the region where the big panel speakers and all-out designs like the Infinity IRS Beta score hands down. But the SL600Si's achieve musical perfection on that restricted scale. I cannot imagine a more pure presentation, for example, of the "Laudamus Te" in the Philips recording as presented by these speakers. Iona Brown's obbligato violin, its tone color absolutely correct, weaves a delicate tracery around Janet Baker's rich contralto, supported by cello and chamber-organ continuo. There are no speakers, just a rectangular window into a holographically real miniature representation of the church acoustic.

**Measurement:** The 600Si's impedance plot is shown in fig.11. With enclosure and tweeter resonances lying at 60Hz and 1200Hz respectively, the value stays above 8 ohms until 4kHz or so. The entire treble is shelved down, however, presumably due to the tweeter designer

<sup>6</sup> Richard Lehnert's *Schwann* Guide informs me that the original LP version is long gone, this stunning non-authentic performance only now being available on LP as a Sequenza re-release (6527 7099). It is also available on CD (416 415-2) or cassette.

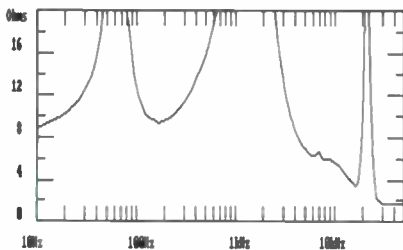


Fig. 11 Celestion SL600Si, impedance

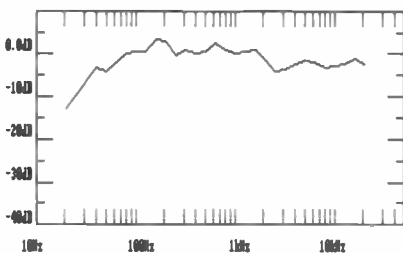


Fig. 12 Celestion SL600Si, spatially averaged,  $\frac{1}{3}$ -octave in-room response

trying to squeeze sufficient sensitivity from it, indicating that current-meager amplifiers are best avoided with this loudspeaker. The low 82dB/W/m sensitivity also indicates that low-power amplifiers are also to be avoided. This is one fussy loudspeaker when it comes to choosing a matching amplifier. The very sharp peak at 2kHz is due to the notch filter used to counteract the tweeter's high amplitude peak at resonance.

Measured in the nearfield, the bass extension was moderate, the -6dB point relative to the level at 100Hz lying at 47Hz. The rate of roll-off was shallow, however, resulting in an in-room response (fig.12) with useful small-signal extension to around 36Hz. The spatially averaged in-room response reveals the tweeter to be about 2.5dB too low in level referred to the mean woofer level. The latter is a little lumpy in the upper bass, and also around 600Hz or so. On-axis, the tweeter response is rising a little by 20kHz, but it is so directional at this frequency that the overall response is down a little. At the bottom of the tweeter's passband, the response is characterized by a lack of energy in the octave between 2 and 4kHz, this worsening off the speaker's direct axis and below the tweeter axis. The SL600Si is therefore a speaker that *must* be listened to on the correct axis if the high treble is not to become too depressed

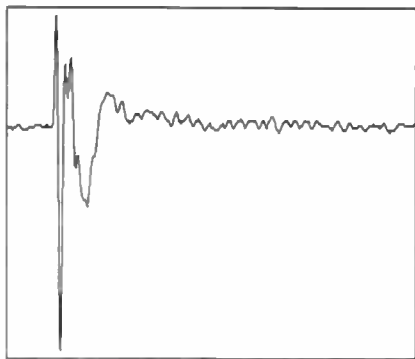


Fig. 13 Celestion SL600Si, impulse response (5ms window)

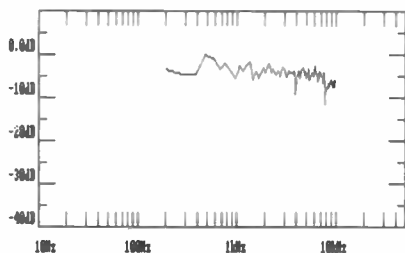
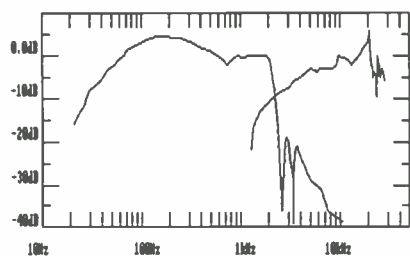


Fig. 14 Celestion SL 600Si on-axis FFT response

and the presence region too sucked-out. (The depression was only 3dB with the microphone level with the cabinet top.)

Fig.13 shows the 600Si's response to a 55 $\mu$ s unidirectional rectangular pulse, taken just above the tweeter, which will correspond to the listening axis. The initial response is inverting (remember the test pulse was negative-going) due to the tweeter being connected in reverse polarity, as is usual with a symmetrical, 12dB/octave crossover. Note how, in comparison with the Vandersteen 2Ci, the bulk of the energy takes considerably longer to arrive, almost 2ms in fact, due to the non-time-coherent nature of the crossover and drive-unit placement. The ringing in the impulse tail has a frequency of around 7500Hz; I have no idea of its cause, but it probably isn't coincidence that a small resonant peak appears in the impedance plot (fig.11) at the same frequency.

The FFT-derived amplitude response (from a 10ms window rather than 5ms) can be seen in fig.14. Again in contrast to the Vandersteen, note how the use of second-order slopes and a reversed tweeter polarity results in an osten-



**Fig. 15 Celestion SL600Si, nearfield woofer/ tweeter responses**

sibly flat amplitude response, this being achieved, however, at the expense of the time-domain performance. Which is more important depends on the designer's (and listener's) priorities—these two speakers admirably demonstrate the two extremes. For some reason, the 2–4kHz depression in the in-room response doesn't show in fig.14; this is a function of the microphone position used to capture the impulse response, reinforcing the idea that the optimal listening axis is slightly above the tweeter. Noticeable, however, in both figs.12 and 14, is the peak at 600Hz. (It also appears in the measurements of the SL600Si published in the March 1989 issue of *Hi-Fi Choice*.) This excess energy may correlate with the occasional feeling of slight midrange confusion or thickening noticed on audition.

However, it *doesn't* show on the plots of the individual drive-unit responses, measured in the nearfield (fig.15), which suggests that, perhaps, it is a cabinet phenomenon. Martin Coloms conducted accelerometer measurements on the original '600's back panel, which showed a vibrational mode at about 650Hz—see *HFN/RR*, May 1983, p.58. I remember some discussion at that time, though, which suggested that misterrmination between the woofer cone and the surround at that frequency was the culprit, which is presumably why the woofers of the SL6S and SL700 use composite surrounds with two different compliances. If that is true, then I am a little puzzled as to why Celestion decided to stick with the single surround for the '600Si woofer.<sup>7</sup> Whatever, the SL600Si's woofer can be seen to be fairly well-behaved overall, with a steep acoustic roll-out above crossover over which is superimposed a series

of dips which I suspect are more a result of interference phenomena due to the nearfield microphone placement than to actual cone breakup. (The latter was blamed for just about all the woes of the modern world by J. Peter Moncrieff in his review of the original SL600 and SL6 in *IAR Hotline* #35.) By comparison, the similar plot for the Vandersteen 2Ci, fig. 5, was taken with the microphone far enough away that I am more sure that the irregularities in the woofer's above-crossover response *are* due to cone breakup.

Looking at the tweeter response in fig.15 (strictly speaking, this is not a nearfield measurement except in the bottom few octaves of its range, due to the small wavelengths at 10kHz and above), it can be seen that it both has a deficiency of energy immediately above crossover and is set a little too low in level. The subjective balance of the SL600Si is, I am sure, while musically pleasing, therefore a function of the limited tweeter sensitivity. Padding down the woofer might produce a flatter response overall, but the system sensitivity would then drop to the point of unacceptability. Its delayed roll-in would also explain the lack of energy in the 2–4kHz region seen in fig.12. The tweeter starts its rise toward resonance above 15kHz, this reaching +6dB by 20kHz before the notch filter cuts in. The debate still continues (see my interview with Robin Marshall in February, Vol.12 No.2) as to whether this resonance should be notched out or allowed to ring free. From tracing out a neat peak between the shoulders either side of the notch at 20kHz and 23.4kHz, it would seem that without the filter, the tweeter resonance peak would rise at least 12dB above the drive-unit's nominal reference level, which may well lead to intermodulation problems if allowed to ring out unrestrained.

**Conclusion:** In its revised Si incarnation, the SL600 has, in my opinion, one of the cleanest trebles around, bettering just about every other dynamic loudspeaker in its presentation of a natural violin tone. It offers a higher degree of transparency than its ancestor, with slightly lower levels of lower-midrange congestion. Nevertheless, its need for pedigree amplification, its sweet, if somewhat dark-sounding and "polite" tonal balance, and its restricted dynamics mean that the SL600Si is by no means a speaker for Everyman. It is also less ruthlessly revealing of musically relevant detail than the

<sup>7</sup> I suspect they felt that this would render the sound too much unlike the traditional SL600 sound.

SL700 or Vandersteen 2Ci, and it doesn't begin to approach the precise time-slicing abilities of the best US speakers, such as the Thiels. But I can quite see why some commentators have proclaimed it to be more consistently musical than its 50% more expensive sibling. In fact, I am tempted to keep both pairs of speakers on hand: the '600s for when I want to be swept along by the tide within the music, the '700s for when I need a rather more analytical viewpoint (without losing sight of the music).

If your musical tastes tend toward classical music, your room is relatively small, and you don't mind using high-quality front ends and amplifiers, then the Celestion SL600Si will consistently offer you sound which, if not quite

scaling the dynamic peaks and see-through clarity of the best panel speakers, will never fail to be musical.

Should you replace your existing SL600s with the Si revision? It depends on your priorities. I would say yes, but only if you already have upgraded your amplification or source components to the point where further investment would only bring a minuscule improvement. If not, then you have other areas to improve first.

Incidentally, though expensive, the SLSi stands impressed me with the solid foundation they gave both the speakers and the music. Check out the 24" model, all you LS3/5a and Acoustic Energy AE1 owners!

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## MITEK ZSE 380 LOUDSPEAKER

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Thomas J. Norton

Two-way, dipole loudspeaker system. Drive units: 15" (380mm) woofer, 1.4" (35mm) tweeter. Cross-over frequency: 1.2kHz. Frequency response: 35Hz-25kHz (no deviation specified). Sensitivity: 91dB/W/m. Nominal impedance: 8 ohms. Amplifier requirements: 50W (minimum). Dimensions: 34" H by 17.5" W by 27.5" D. Weight: 45 lbs each. Finish: (see text). Price: \$1800/pair (including controller). Approximate number of dealers: 12. Manufacturer: The Mitek Group, One Mitek Plaza, Winslow, IL 61089. Tel: (815) 367-3000.

While stuck at a stoplight a few weeks ago, twiddling my thumbs and wishing that the car radio was out of the repair shop and available for some minimal entertainment, I happened to glance into the passenger compartment of the car ahead. There, on the rear deck, were a pair of 6" by 9" loudspeakers. Normally this wouldn't be worthy of comment, but the speakers weren't mounted *in* the rear deck. They were, instead, mounted on open baffles not much larger than the speakers themselves, the entire kludge propped up against the rear window. Assuming this was not a temporary setup, it revealed two things about the owner—first, that he or she could expect a nasty surprise at the first sudden stop, and second, that said owner didn't have a clue about the proper functioning of loudspeakers.

Loudspeakers (at least the dynamic, cone variety) belong in boxes. Or so goes the conventional wisdom. Leave the front and the rear of a loudspeaker open to the same airspace and nasty things happen. First, the low-frequency response disappears. Below a given frequency (where half the wavelength equals the average



**Mitek ZSE 380  
speaker**

baffle dimension), the front and rear radiation, out of phase with each other, simply cancel out—the quintessential demonstration of one hand clapping. Second, a loudspeaker driver flapping in the breeze has a severely diminished power-handling capability, especially if it is designed, as most of them are, for box loading. None of this is exactly earth-shattering news. The art and science of properly matching cone drivers to enclosures to avoid these problems began with the invention of the loudspeaker and continues to the present.

But even if a designer gets the theoretical “tuning” of the enclosure correct (a tall order in itself), there is another problem with the conventional loudspeaker enclosure: It likes to sing along with the tune. What’s worse, it has a rotten sense of rhythm and pacing; its harmonizing is always out of step with the primary output from the driver—not enough to cause an obvious echo, but enough to muddy the sound. The cabinet, in short, stores energy and releases it milliseconds later as delayed resonances. Serious designers have found ways to minimize the problem, but they don’t always agree on the best approach. One school of thought (particularly strong in Britain) believes that the structure of the enclosure should be light but heavily damped. Another school opts for maximum mass and rigidity (within commercial constraints).<sup>1</sup> All-out efforts of either school tend to be expensive, as the Celestion SL700 (light but damped) and Wilson Audio WATT (dense, rigid, and heavy) attest.

But suppose we could find a way to eliminate the enclosure and still maintain a full-range response. In a sense we already have. It’s called the dipole loudspeaker, and is found in several guises at your local stereo shop—most commonly as a panel design, either magnetic (Magpans and Apogeos) or electrostatic (Sound Labs, Quads, etc.). Such designs compensate for the bass cancellation problem—more or less successfully—by the use of a large radiating area and an inherent frequency response which compensates for the natural dipole rolloff. Attempts at dipoles using conventional cone drivers, however, have been less common. Back in the ’50s, Wharfedale produced a large, open-baffle array. The present Carver loudspeakers—which combine open-backed

dynamic woofers with ribbon tweeters—were preceded by a less successful, enclosureless, cone-driver, Carver design marketed by Phase Linear around 1976 (the Andromeda III). And the Dahlquist DQ-10, although it has a conventional woofer enclosure, employs free-space mounting for its midrange and tweeters. There have undoubtedly been other attempts, but they tend to be as scarce as chile dogs at a wine tasting.

Probably the most intriguing recent attempt at open mounting of conventional cone drivers was the Enigma subwoofer, reviewed in Vol.8 No.8 by Dick Olsher. It used four 15” woofers mounted on a 3’ by 3’ baffle. Bass equalization, built into the (included) crossover network, compensated for dipole cancellation, and bass output, according to Dick, was strong down to 20Hz. If Dick’s more recent foray into sub-woofering can be used as a benchmark, his reaction to the Enigma could be described as positively ecstatic. But subwoofers are a difficult sell at best, and the Enigma, to the best of my knowledge, made only a modest market impact and is no longer available.

The designers of the Enigma, however, were apparently determined to expand their concept for an enclosure-free woofer to a full-range design. That design is now in production as the ZSE 380, manufactured and marketed by The Mitek Group.<sup>2</sup> The ZSE (which stands for Zero Stored Energy) is cosmetically so similar to the Enigma that the two could be used as a satellite/subwoofer set. The actual shape and size of the ZSE, however, is quite different. Its single 15” woofer is mounted on a baffle just under 18” square. This is mounted near the floor, tilted up slightly to aim its axis at the listener. The tweeter is mounted on a separate baffle above the woofer. The two baffles are connected together by a bracket which also serves as the rear support for the entire structure. Both spikes and soft feet are provided. Individual connections are available for the woofer and tweeter; the system may therefore be bi-wired (I did not audition it this way). Both the front and the back of the speaker baffles are covered with grille cloth which is not removable by any technique I could determine. The magnet structure of each driver may be seen bulging against the rear grille, however, and the magnets of

<sup>1</sup> Matters aren’t quite so simple, of course. The heavyweight crew throws in damping too, for good measure.

<sup>2</sup> The Enigma was produced by a company called Sound Associates.

both woofer and tweeter appear to be quite heavy.

The ZSE's striking appearance resembles a minimalist, Dali-esque, ultra-modern chair. The finish is excellent; this is definitely not just another box loudspeaker. It also comes with an outboard controller which provides the required low-frequency contouring and *must* be used with the system for it to function properly. The controller also provides for optional high-frequency contouring; a front-panel switch allows the user to select either "analytic" or "classic" (Mitek's terminology). It may be connected either between the preamp and power amp or in a tape-monitor loop; the former option was used for the review. I found one flaw in the physical design of this controller: The flange surrounding the rear-panel jacks made it impossible to use interconnects with unusually fat plugs, the WBT being a prime example. A careful check with the interconnects you plan to use may save you the expense of a new set of leads—hardly a trivial matter.

The ZSE comes partially disassembled—the baffles must be mounted to the rear support bracket using furnished hardware. It wasn't particularly difficult, but an extra pair of hands will come in, ah, handy. Unfortunately, both of the tweeters provided in the review samples were intermittent; the connecting posts on each had worked themselves loose either in production or in transit. A quick set of replacements from Mitek put us back in business. Apparently there were some early problems with the tweeter terminals which have since been sorted out.

I set the ZSE 380s up in my favored loudspeaker location, along the long wall, toed-in toward the listening position, and well removed from any adjoining walls. Other locations and orientations (including aiming the loudspeakers straight ahead) were tried, but I ultimately judged the initial position to be optimal. Mitek claims that positioning is less critical with the ZSE than with most loudspeakers. They're partially correct—like all dipole radiators, the sonic energy emitted from the sides and top of the ZSE is lower than that from the front and rear,<sup>3</sup> so reflected energy from those directions will be less problematic. But, as in all dipole radiators, the strong rear radiation must be

dealt with. Mitek claims that the 380 may be placed as close to the rear wall as the support leg will allow (just over 2'). Perhaps it might, in the right room. In mine, I preferred to give the ZSEs more space to breathe.

Associated equipment used with the ZSEs included the Well-Tempered arm on the VPI HW-19 Mk.II (new motor), Krell KC-100 cartridge, Klyne SK-5a preamp, California Audio Labs Aria CD player, Levinson No.23 power amp, and Monster M-1 loudspeaker cables and M-1000 interconnects.

I had high hopes for the ZSE. It did have a notable freedom from box-like colorations, but in this price range one also has a right to expect more. The "more" begins with a reasonable bass extension, and the 380's major failing was in this region. I found the midbass generally good, but also somewhat unpredictable; on some program material I heard traces of a tubby, boomy quality. It was not severe, but I *have* heard cleaner response on the same recordings from rather conventional, but good-quality (and less expensive) box loudspeakers. Still, by itself this would warrant only a minor criticism. More serious was a genuine lack of bass extension. The sense of bottom-end weight was simply not there. The string bass on Dave Grusin's *Discovered Again!* (Sheffield Lab-5) was lumpy in the upper reaches of its range, subdued at the bottom. Telarc CDs almost totally lacked their patented bass-drum impact. Kick drum fared better, but primarily because its characteristic skin sound gave it a framework for the ear to latch onto. But even there the weight was missing—witness the lack of punch to the lead-in drum on "Bird on a Wire" from Jennifer Warnes's *Famous Blue Raincoat* (Cypress/A&M YD 0100/DX 3182 CD). Organ fared only a bit better, the sheer quantity of LF energy in this instrument managing to provide some feeling of fullness. But the power and extension were not there, and the definition in the rest of the bass range was only fair. Moving the 380s closer to the wall didn't help a great deal with the extreme low end, but did make the midbass arguably less smooth.

My subjective impression of the LF of the ZSE was that it extended down to about 70Hz, at best, with a fairly rapid rolloff below that point and very little of use below 50Hz. Measuring the response of the controller box provided a possible explanation. The bass

<sup>3</sup> Especially at the low end, because of that good old dipole cancellation.

boost, designed to compensate for the system's dipole cancellation, peaked at 80Hz (+6dB) with a sharp rolloff below 60Hz. As the large, single woofer apparently requires protection from excessive excursions at low frequencies, the bass is therefore severely curtailed in the bottom two octaves. The bottom line is that most of our recommended loudspeakers in the \$1000 price range (certainly those with which I am familiar) will outperform the ZSE in LF extension and overall bass smoothness.

Matters improved in the midrange. It was, as I have already noted, free of obvious, box-like colorations. Soundstaging was very good. One of my favorite tests for this characteristic, the opening "cave capers" cut of *Caverna Magica* (CBS CDCBS 25265) was dramatically successful—spread wide and deep, the sonic image breaking free of the "enclosure" locations. And though the soundstage was not nearly this dramatic on most recordings, it was clearly the ZSE's major accomplishment. It did, however, take a while to adjust to an image as close to the floor as that produced by the 380. You may find the illusion of "short" musicians disconcerting. I didn't find it a serious distraction after becoming accustomed to it.

Despite its generally low apparent coloration, however, the ZSE's midrange seemed to lack a certain degree of inner detail and openness. The problem was not at all obvious, but did become apparent on extended listening to a wide range of program material. The soundstaging on *The All Star Percussion Ensemble* (MMG MCD-10007, CD) was well-developed in both width and depth, but there was a degree of cloudiness both in detailing at the rear of the soundstage and in the overall clarity as the scoring became more complex. In the previously mentioned "Bird on a Wire" Jennifer Warnes's voice is doubled (by Leonard Cohen's?) in the closing passages. The two voices are not clearly differentiated over the ZSEs, but tend instead to homogenize. Most of the time the losses were subtle, but noticeable compared with the midrange detail of a lively, open-sounding loudspeaker such as the Snell C/II. The problem, I feel, is in the use of a 15" driver up to 1.2kHz. Frankly, I was amazed that the midrange sounded as good as it did. If I didn't know that much of it was coming from such a large diaphragm, I wouldn't have guessed.

The elimination of an enclosure undoubtedly has a lot to do with the low levels of col-

oration, but there are limitations to a driver of this size, and it ultimately affects both the quality and quantity of detail. A 15" woofer has a lot of mass to push around in the midrange. It also becomes quite directional at the upper end of its range. The choice of such a large woofer was very likely predicated on the special requirements of this design in the low frequencies; its use up to 1.2kHz is clearly a compromise. It's more successful than I would have expected, but I feel that a separate, dedicated midrange driver would be a definite improvement. Such a driver would have other positive side-benefits: It would respond higher into the midrange, extending the range of the ZSE's dipole action (the tweeter does not operate as a dipole); it would also, by allowing a higher upper crossover frequency, permit the selection of a smaller, more refined and extended tweeter.

So far I haven't been too encouraging. I would like to be able to say that the ZSE made a smashing comeback in its reproduction of the high frequencies. But it did not. The "analytical" position, which caused a very slight lift in the mid- and high treble (about 1.4dB) was decidedly bright. The lower highs were emphasized, the upper highs a bit subdued. There was also, depending on the program material, a lack of subtlety and refinement to the quality of the HF response. The chorus in *Kor* (Proprius PROP 7770, LP) is a difficult test for any loudspeaker. Through the ZSEs the sibilance in this recording was just past the point of acceptability. The high-hat on *Serendipity* (Reference Recordings RR-20CD) leaned to the hot and sizzly, especially when struck hard. And *Famous Blue Raincoat* had a noticeable bite and hardness which increased with level. On recordings with modest HF content, the ZSEs were listenable. But as the level and quantity of high-frequency transients increased, the 380s brightened to the point where I no longer found the listening experience enjoyable.

Switching to the "classical" position of the controller (which cuts the high end above 5kHz by about 1.4dB) definitely turned down the heat—the overall sound became softer and much more pleasant. But there was a definite tradeoff. Detailing was reduced (the limitations of the midrange became more obvious, though still not disturbing). It was, however, the better of the two choices. Changing the preamp-power amp interconnects from the M-1000s to



the older, softer-sounding Monster Interlink Reference As (a remedy which had been effective with the Snell C/IIIs) also tamed the high end a bit. But I was not really satisfied with either choice. And I was left wondering if the problem was with the tweeter, the chosen HF contour curves, or the control box itself—well-built, but heavily dependent on integrated circuits. The high-frequency response in the analytic position *was* reminiscent of the sound of less-than-audiophile-quality solid-state equipment.

The measured impedance of the ZSE indicated a system which should be easy to drive. The minimum impedance was just over 6 ohms at 70Hz and 20kHz. The low-frequency impedance peaked at 22Hz, indicating the free-air resonance of the woofer (which will be the same as the system resonance in the absence of an enclosure). Another, higher peak at 1kHz indicated the crossover point. It was quite pronounced—impedance compensation is apparently not used on the woofer. My measurements also showed the ZSE to be just slightly less efficient than the Snell C/II—but keep in mind that I measured the relative efficiencies using pink noise and an unweighted meter. Translation: the stronger LF output of the Snells produced a higher reading than a comparison of midrange efficiencies alone would show. The important point is that the efficiency of the ZSE does not make unusual demands on the driving amplifier. The 6dB boost at 80Hz produced by the controller, however, must be taken into consideration. I consider the manufacturer's recommended minimum power of 50W an absolute minimum, and would personally feel more comfortable with an amplifier

capable of at least 100W.

The ZSE was auditioned hard on the heels of my completing a review of the Snell C/II. The two speakers are so close in price that a brief comparison seems mandatory. I had some reservations about the high-frequency response of the Snells, though I found them excellent in nearly all other respects. The ZSEs, in the analytic position at least, were clearly brighter than the Snells, with more apparent output (and more measured output as well) in the 5kHz–10kHz region. The Snells were airier, more open, and more detailed in the midrange, cleaner in the midbass, and more extended in the extreme low end. The Snell is, visually at least, rather conventional. But, in my opinion, it is a considerably more effective design.

An unending stream of box loudspeakers is brought to market at a monotonously steady pace. Between the time I write this and the time you read it there will probably be 300 more examples of the breed. *Stereophile* has reviewed many of them, and will certainly continue to do so. The really imaginative product, however, is rare. The ZSE 380 *is* imaginative—a truly intriguing device. But I feel it is not yet a finished design. It needs a more extended low end and sweeter, more refined highs. The latter should be an attainable goal. There may, however, be no way to do the former within the price/size constraints of the current product. I cannot recommend the current realization of the ZSE to the critical audiophile, but an all-out design built around the same principles with a LF response approaching that of the Enigma subwoofer, a separate midrange driver, and a superior tweeter, would certainly be something to hear. The concept has promise. **S**

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## CLASSIC AUDIO CA 260 DUAL-MONO TUBE AMPLIFIER

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Dick Olsner

Type: hybrid, with a FET/tube driver stage and a tube output stage. Power output: 50W sinewave continuous average power output per channel, both channels operating into 2, 4, and 8 ohms load impedance. Power bandwidth: 17Hz–35kHz. Frequency response: 10Hz–100kHz,  $\pm 0.25$ dB, at 10W. Harmonic distortion: less than 0.25% at any power level to 50W from 20Hz–20kHz. Input impedance: 100k ohms. Input sensitivity: 0.75V. S/N ratio: 90dB (unweighted), more than 100dB (A-weighted). Tube complement per channel: 12BH7 driver 2x6550 output. Dimensions: 17" W by 6.5" H by 17" D (including handles). Weight: 56 pounds. Approximate number of dealers: 1 (factory-direct). Price: \$1665 if purchased through a dealer; \$1299 direct from Classic Audio.



Classic Audio CA 260 power amp

Sample tested: S/N 1004, on loan from the manufacturer. Manufacturer: Classic Audio, Ltd., 238 Liberty Avenue, New Rochelle, NY 10805. Tel: (914) 633-3039.

As names go, "Classic Audio" is obviously pregnant with the hint of vacuum tube technology. For many of us, the amplifier classics of yesterday are associated with the likes of Marantz and McIntosh. These were amplifiers that certainly did not get in the way of the music, if anything providing certain "enhancements" to the musical fabric. By that I mean that the reproduction was generally more liquid, lush, and vivid in texture than the original. In these respects, tubes have yet to be equalled by solid-state designs. Having experienced the spacious soundstaging and palpable imaging of, say, a Futterman H-3a, or, more recently, an EAR 509, I find it difficult to accept the flat universe of solid-state. I used to think that as transistor technology advanced and as solid-state designs matured, that the perceived gap between tubes and transistors would vanish. Excepting for the moment Bob Carver's deliberate efforts to mimic tube sound, that has yet to happen. Undoubtedly, we've come a long way from the '60s seminal solid-state designs with great bass, grainy and overly hard mids, and sizzly highs. Today's best solid-state efforts are eminently listenable, yet the tube midrange glow and vividness are still missing.

It is quite possible that the attributes of the classic tube sound are inherently rooted in tube

colorations. If this were true, then arguably much of tube sound is due to its higher complement of even-order harmonic distortions and possibly euphonic alteration of complex waveforms. Framed in this way, the issue becomes one of objective *vs* subjective reality. The transfer function of solid-state designs may be more accurate in terms of preserving measurable input characteristics, but that of tubes may process the signal in ways more pleasurable to the ear/brain system—at least for two-channel stereo. With the best of solid-state gear, we may be more clearly coming face to face with the limitations of trying to recreate a 3-D soundstage with merely two channels of information.

Personally, and speaking as a tubeophile, I do not find such implications in the least disturbing. And to the technophiles who would have us view tube dimensionality as a coloration, I suggest that they let go of that red herring while there is still time. This business is all about illusion; the illusion of reproducing the live experience at home. And whatever equipment better elucidates the perception of live music must inevitably be superior.

I recently had a dream. Here I was at the Gates of Heaven trying to squeeze my way in past a burly guard. To my astonishment, I was

stopped and informed that Heaven was temporarily closed to tubeophiles. The official explanation, as best as I can remember it, was that tube lovers having enjoyed heaven on earth for so long, long-suffering and otherwise deserving solid-staters were given first priority at a vacancy. Through the fence I caught a glimpse of an infinitely long row of old Quad ESLs being driven by mint-condition Marantz 8Bs. Heaven indeed!

I'm sure that Classic Audio's George Kaye would have little conceptual difficulty with my vision of Heaven. After all, he is the inventor and designer of the Moscode line of hybrid amps and preamps for New York Audio Labs. He left NYAL in October of 1986, founding Classic Audio in August of 1987 with Steve Rowell of Audio Classics fame. Things apparently got so busy for Steve in his retail operation that he sold George his half of the operation. Hence, George is now the president of Classic Audio and solely responsible for the product. His main design criteria are: musicality, reliability, and ease of service. I can't at present comment on the last two objectives, but I'll let the cat out of the bag and tell you that he has indeed succeeded to a large degree in the area of musicality.

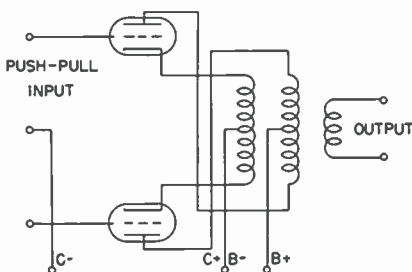
The Classic Audio CA 260 amplifier is dual-mono in construction, with two independent channels laid out in one chassis. The only things common to both channels besides the 14-gauge steel chassis are the power cord and power switch. The output circuitry is modeled after the famous McIntosh "unity-coupled" output circuit (see fig.1). As you can see, half of the load is fed to the plates of the output tubes, while the other half is placed in the cathodes of the same tubes. Thus, the output stage may be considered to be operating partially as a cathode follower. One of the advan-

tages of this topology is the introduction of about 10dB of local negative feedback around the output stage. Not shown in fig.1 is another output-transformer winding—separate from the main output winding—which provides a minimal 8dB of feedback to the input stage. Isolating the feedback winding from the load in this fashion greatly enhances the stability of the amplifier into highly reactive loads. The severe phase shifts of such loads can cause a conventional negative feedback loop to become regenerative if the feedback voltage is taken from across the load.

The phase splitter/driver stage of the old McIntoshes has been modernized with a differential-cascode hybrid circuit using FETs and a 12BH7 twin-triode tube. Interestingly enough, McIntosh's vintage 1953 30W amplifier also used a 12BH7 triode. However, it is not clear to me as to whether the new driver stage has been intended as an improvement over the old, or as a cost-cutting measure. If this is an attempt to put old wine in a new bottle, then it has been diluted by the addition of modern wrinkles. Why not simply duplicate the classic as closely as possible? I wish I had a bevy of classic McIntoshes on hand (eg, the MC30, MC40, or MC240)<sup>1</sup> to compare sonically with the CA 260; however, I suspect that the sound of the older generation is much more gloriously tubey, in the classic tradition.

The output stage uses a pair of 6550s in a push-pull configuration. (All tubes are sourced from Gold Aero.) Extensive regulation has been applied to the output screen grids and driver-stage plate supply. However, the output plate supply is unregulated, to allow the amplifier a greater peak-power headroom and soft clipping characteristics.

The power switch is conveniently located on the front panel, speaker connections and gold-plated RCA inputs jacks on the back. The terminal strip provides 2, 4, and 8 ohm taps to accommodate a variety of speaker loads. According to Classic Audio, the amplifier may also be bridged for a doubling of output power. Construction quality and attention to detail are quite remarkable at the asking price; I've seen amps costing much more that weren't built as solidly as this. The amp is guaranteed to be free of defects for a period of one year (180 days for



**Fig. 1 The McIntosh unity-coupled circuit**

<sup>1</sup> I'm sure you would too, considering the current market prices of vintage units.

tubes), and is available factory-direct under a 10-day in-home audition offer. So if you're not completely satisfied, your money will be refunded for the full purchase price (less shipping).

Most of my listening impressions were gleaned with the Quad ESL-63 USA Monitors, the Threshold FET-10 preamp, and primarily analog program material. However, my first impression of the CA 260 came at the hands of the Audio Exklusiv P3 ESLs (a full review is in progress). These are exciting little electrostats that possess an amazing "jump factor." My first samples had a measured rising upper-octave response starting in the upper mids. The best way to describe the resultant tonal balance is as clean/polite brightness. The upper octaves were not edgy or sizzly, just too prominent. With the CA 260 in the system, the upper octaves were quite civilized, sweet, and spacious, and the lower-mid lightweight textures of the P3s were highlighted. With the same speakers, the VTL Dual 75 provided a gutsier, more robust balance, more assertive highs, and much better delineation of dynamic shadings from soft to loud. Certainly, the implications were that the CA 260 was more cerebral in the midrange than the VTL, and that it was compensating through the upper octaves for the P3s' excessive treble information.

With the Quads it became obvious that not all was well with the upper octaves. Specifically, with the Lesley Test, the extreme highs were closed-in and the upper registers of Lesley's voice were dulled as if some of the natural brilliance of her upper formants was wiped out. Here, soundstage transparency and image focus were quite good, but, judged against the performance level set by Class A amplifiers, there were some losses in these areas. In this context, the CA 260 may be said to be slightly veiled and unfocused. I was also bothered by a slight tonal alteration which emphasized Lesley's lower registers. On the Quads there was less of Lesley's vocal character coming through than with a host of other small tube amplifiers on hand. The Klimo Kent, the Keschull 35/70, and even my venerable Radford STA-25 Series III all managed to retrieve a much larger chunk of Lesley's tonal flavor. Putting it another way, Lesley was simply less recognizable with the CA 260. And if that were not bad enough, on loud passages a slight edge crept into the upper registers—sort of a slight screamy quality—that was clearly a reproduction artifact.

These findings were basically reinforced with analog program material. Take *Laudate!* (Proprius 7800), for example. Soprano voices were dull and closed-in at the top. On loud passages a slight edge crept into the upper mids. Individual voices in the chorus were a bit less distinct than they should have been, and dynamic gradations were compressed. The overall presentation, therefore, lacked excitement and incisiveness. On the Opus 3 *Test Record 1*, the CA 260 gave a better accounting of itself. Here the bass was quite tight and focused, with excellent pitch definition. Therese Juel's voice was only slightly unfocused, and her sibilants were well-controlled. Yet the soundstage somehow never fully came to life.

Sir William Walton's *Belsazzar's Feast* (EMI SAN-324) proved to be this amplifier's Waterloo. The sound became edgy when the chorus let loose, and it generally ran out of steam, compressing the dynamics of the performance. In direct competition with the VTL Dual 75 on this recording, the CA 260 got clobbered. The former's power, clean dynamic range, and alive midband swept me away, raised my heart rate, and ultimately left me limp.

## Summary

On balance, the CA 260 strikes me as a decent amplifier, especially considering its factory-direct price. The bass is quite tight and well-defined. Spatial resolution, soundstage transparency, and retrieval of inner detail are competitive with anything in our Class C recommendations. Unfortunately, it appears to run out of steam distressingly early, at least with electrostatic loads. The treble quality, while well-behaved, is on the dull side of neutral; a blessing, I suppose, with a host of dome tweeters. The tonality of the midrange isn't quite right either. A slight thickening of textures was evident on female voice. Neither are the lower mids in the tradition of classic tube sound; they're more neutral and cerebral as opposed to robust, romantic, or lush.

The most serious problem with the CA 260, as I see it, is its immediate competition. The more expensive VTL Dual 75 betters it in several crucial performance areas: it's more dynamic, better focused, and tonally more accurate through much of the range. The only slightly more expensive Quicksilver monoblocks are much more tube-like. If you're truly in search of vintage tube sound, I think you'll be disap-

pointed with the Classic Audio CA 260. In the final analysis, its sound character is neither solid-state nor tube-like. It is suspended in limbo between the two extremes, and, as such, would probably not appeal to either preference.

### **A second sample**

As George Kaye put it to me over the phone, after "taking the heat" of the review constructively, he undertook the task of improving the amp's sonics. And since he felt he succeeded to a significant degree, arrangements were made for a followup. A modified sample arrived in Santa Fe the next day (S/N 1001) and I spent that evening with the amp driving a pair of old Quad ESLs.

### **More Feedback Please!**

In these days of low-sodium and no-cholesterol, it is gratifying to discover that more of something can actually be good for you. And in this case, according to George Kaye, the cure proved to be increased global feedback in order to better control the output transformers. The screamy, edgy quality under large signal drive that I experienced previously may have been due to transformer ringing; whatever the cause, this problem was certainly cured this time around. The sound of the second sample (current production if you will) was smooth and edgeless over the entire dynamic range, from soft to very loud. However, much of the sonic character of the earlier sample remained in force.

Starting with the Lesley Test, the emphasis of the lower registers and the dulling of the upper registers was still obvious. Basically, I felt that the presentation was clearly more natural and cohesive than with the first sample. Tonally, it was Lesley all right, but it was a case of Lesley in the next room or behind a curtain. I'm sure that had I recorded Lesley that way, that's exactly how she would have sounded: noticeably dull, veiled, and defocused. On the other hand, the texture of the mids was always liquid and silky smooth.

These impressions were reinforced with analog program material. Instrumental outlines were broadbrush; for example, it was difficult resolving massed voices. The lower mids were slightly warm, the upper mids dull and distant. The treble was a bit lifeless and lacked spaciousness. Bass articulation was excellent, with plenty of impact and detail, however. In this

respect the CA 260 clobbers the typical 50-watt tube-amp competition. The overall impression was always musical and natural in the sense of a concert hall back-row perspective.

Putting all of the pieces together, what you have is a soothing, inoffensive presentation, with a rolled-off tonal balance, and some sacrifices in the areas of transparency and imaging incisiveness. This adds up to what might be dubbed the Anti-Krell sound: a somewhat diffuse and non-analytical sound in complete antithesis to what solid-state usually offers. This is actually meant as a compliment, because despite the fact the Classic errs in a number of respects, what it does right or wrong is always easy to accept.

The warm, broad-brush textures of the Classic Audio's sound reminded me sufficiently of the performance of the vintage Michaelson & Austin TVA-10 that I even went to the trouble of lugging my modified TVA-10 out of the closet. While I clearly preferred the bass of the CA 260 and it was clearly smoother and cleaner through the upper octaves, the TVA-10's tonal balance was more accurate and I was surprised to discover that it was even better focused.

### **Limited Edition & Buying direct**

The amp is a "Limited Edition" in the sense that its output and power transformers are genuine McIntosh—part of a long lost cache discovered by Classic Audio in a warehouse in upstate NY. When these originals are gone, so will the Limited Edition. When that day comes, Kaye is planning to build exact-specification duplicates. The amp is strictly being sold direct to the public. There is no dealer network. Why should you take the plunge? For one thing, George Kaye does have a proven track record as a designer, and for another there is the very attractive price (no middleman) and the 10-day in-home audition offer.

### **Finally, A Recommendation**

An important point that bears emphasizing is that I was under the impression during the initial write up that the amplifier was being sold at retail at its recommended \$1665 price, not factory-direct at \$1300. The construction and parts quality are indicative of a \$2000 plus retail price tag and at over \$1600, and with the host of objections I raised initially, I did not feel the CA 260 merited a recommendation. Now with

several significant sonic improvements and a real-world price tag that is significantly lower than that of the VTL Dual 75 and somewhat lower than that of a pair of Quicksilvers, the CA 260 looms as a great value. It still is far from perfect, but within the context of our Class C recommended components, I can't think of a

more musical contender. If I had \$1300 to spend on an amp, I would strongly consider the CA 260. This might be the perfect amplifier for driving Thiels or other dynamic speakers with a treble zing that grabs you by the throat. It might also be a synergistic cure for over-bright cartridges. **S**

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## CONRAD-JOHNSON PV9 TUBE PREAMPLIFIER

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John Atkinson



Conrad-Johnson PV9 preamp

Tube preamplifier with five line-level inputs, two tape loops, and one phono input. Specifications: Frequency range: 2Hz–100kHz. RIAA error:  $\pm 0.25$ dB. Input impedance: 47k ohms in parallel with 100pF (phono), 47k ohms (line). Output impedance: less than 200 ohms (main). Phono stage gain: 47dB. Line stage gain: 31dB (polarity-inverting). Rated output level: 2.5V (20V peak maximum). Phono overload: greater than 200mV at 1kHz. Distortion: THD less than 0.25%, IMD less than 0.25%. S/N ratio (20Hz–20kHz): 77dB ref. 10mV input (phono), 85dB ref. 2.5V output (line). Tube complement: 2x12AX7, 3x5751, 2x5965. Dimensions: 19" W by 14.25" D by 5.25" H. Weight: 20 lbs. Price: \$2950. Number of dealers: 72. Manufacturer: Conrad-Johnson Design, 2800R Dorr Avenue, Fairfax, VA 22031. Tel: (703) 698-8581.

As I write, it is garage-sale season here again in Santa Fe, and a recent sign near my home advertised "Over 3000 LPs, good condition, low prices." To my surprise, the seller wasn't a yuppie enamored of his new CD player but a true collector discarding the duplicates and dogs from his collection. 30 minutes later, many LPs heavier—including a mint Flanders & Swan *At the Drop of a Hat!*<sup>1</sup>—and not too many dollars lighter, I returned to a great night's listening courtesy of the black vinyl disc.

Which brings me to the subject of this review. In a world that seems to be becoming increas-

ingly frantic to junk the LP in favor of, yes, CD, but mainly cassette, Conrad-Johnson's \$2950 PV9 appears to be a deliberate anachronism. It uses tubes. It is not particularly neutral. Its performance is optimized to get the most musical performance from LP. It was with some degree of anticipation, not to say trepidation, therefore, that I embarked upon this review.

### Tech-talk

Whereas the PV9's predecessor, Conrad-Johnson's Premier Three, was electrically quite complicated, with cascaded triodes acting as the basic voltage-gain element, the PV9 has a more direct signal path. Following an LP signal from its entry point, it first goes via twisted solid-core wire

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<sup>1</sup> All true audiophiles should check out "A Song of Reproduction."

to the main printed circuit board where it is fed to both grids of a 12AX7 twin-triode tube. The use of both tube sections in parallel gives a 3dB reduction in noise power. The amplified signal is then buffered by half of a 5751 tube used as a cathode follower before being applied to a passive RIAA equalization network. All capacitors used in the signal path, including the RIAA network, are polystyrenes. A physically large, 0.15 $\mu$ F, Conrad-Johnson polystyrene coupling capacitor then feeds the de-emphasized signal to a second voltage-gain block, this consisting of half of a second 5751 triode for voltage gain and half of a 5965 which acts as a cathode follower/buffer. In their literature, C-J claims that the PV9 is a zero-feedback design. However, I assume that they are only referring either to the triodes used for voltage gain or to the overall loop, as a cathode follower by definition has 100% negative voltage feedback.

The output from the phono stage is AC-coupled to the source selector switch (this appropriately mounted at the unit's rear adjacent to the line-input sockets) with a ginormous 2 $\mu$ F C-JD polystyrene capacitor. The selector switch is coupled to the front-panel tape output-select and source/monitor push-buttons by ribbon cable and *one* twisted pair of thin solid-core flying leads to a small pcb mounted on the front panel, this carrying the balance and volume controls. Balance is effected by a rotary switch, with five steps in each direction reducing the level of the appropriate channel by approximately 1.5dB—I measured between 1.2dB and 1.6dB—which may be a trifle coarse for some tastes. The volume control is a large (and expensive) ALPS 100k pot and its output is taken, via thin solid-core cable, to the line stage on the main pcb. This consists of a 5751 twin triode voltage amplifier followed by a 5965 cathode follower, this AC-coupled to the output via more C-JD capacitors. A small DIL-mounting relay mutes the signal for about 90 seconds on turn-on before it is fed to the twin output sockets.

C-J burns-in their tubes and warns in the PV9 owner's manual against substituting other tubes for those specified. Replacing the high-gain 5751 triodes with 12AX7s is said to seriously degrade the sonic performance, while substituting a 12AX7 for the 5965 will damage the replacement tube. The only alternative suggested, and this with a caveat that the inevitable degradation will be subtle, is to use a

12AT7/ECC81 for the 5965 cathode followers. The PV9 tubes are said to have a typical lifetime of between two and three years.

The phono circuit, having two gain stages, will be absolute-polarity-correct, but the PV9 line section, it should be noted, is polarity-inverting.

Construction is to a high standard. Nonmagnetic aluminum—yes, I know, there isn't any other kind—is used for the chassis, top plate, and front panel. Apart from in the power supply, precision metal-oxide resistors are used throughout and, with the exception of a 4700 $\mu$ F electrolytic used to smooth the filament supply upstream of its voltage regulator chips, and a couple of small electrolytics in the relay supply, all the smoothing capacitors are low-dielectric-loss C-JD polystyrenes and polypropylenes, with physically enormous 13.5 $\mu$ F, 20 $\mu$ F, and 30 $\mu$ F values used as reservoirs for the plate supplies. A Pi filter, consisting of two 20 $\mu$ F caps connected by a power resistor, feeds smoothed DC to three separate high-voltage regulators, one for each gain block. These regulators are constructed from discrete transistors and use totem poles of Zener diodes as their voltage references.

The bugbear of high-gain tube preamplifiers is, of course, microphony. C-J minimizes this in the PV9 by floating the main board, the one that carries all the tubes, on a rubber suspension. (The owner must remember to free this suspension by loosening two bolts before using the PV9.) This arrangement appears to be pretty effective at isolating the tubes from chassis-borne vibration: tapping the phono input tubes produced a slight bonk through the speakers, while virtually hammering at the chassis nearby produced no microphonic noise at all. Strange to say, once I had put the cover back on, hitting it vertically did produce some microphonic noise through the phono input, though *lateral* shock was still well isolated.

A word is in order concerning the PV9's tape-monitor arrangements, which are identical to those on earlier C-J preamplifiers. As well as the rotary source switch, which can select the Tape 1 or Tape 2 inputs, there are two pushbuttons, one switching the tape monitor *input* between Tape 1 and Tape 2, the other selecting Source or Monitor. Whatever source is selected with the rotary control is present on both pairs of tape *output* sockets. It may be my CD-befuddled brain, but I find these controls to be counter-

intuitive. More important, they allow the possibility of positive feedback since the signal from a selected tape-deck output will also be fed to its own input. This will not normally present a problem, but if you have a three-head deck with its own source/monitor switch set to source, or a two-head deck set to record, selecting that deck with the rotary switch will lead to feedback. Conrad-Johnson warns against this in the PV9's handbook—the danger of howl-around also exists with external signal processors used in one of the tape loops—and to minimize the chance of feedback, it would be best always to put the tape deck most often used for recording or the signal processor in Tape Loop 2, so that you don't have to switch through it to reach the other tape input. I must say, however, that I think it awkward design, if not altogether dumb. Presumably it is arranged in this manner so that the two tape inputs can also double as conventional line-level inputs, but, in my opinion, this is most definitely not an optimal solution.

There are no other controls, the PV9 omitting the stereo mode switch that appeared on the previous generation of C-J preamplifiers, as well as on the PV8.

## The Sound

The PV9 was used for about four weeks' worth of everyday listening, as well as for my loud-speaker reviews elsewhere in this issue. As well as the Vandersteen 2Ci and Celestion SL600Si loudspeakers, I also used the Celestion SL700 and Rogers LS3/5a speakers for some of the auditioning. The loudspeakers were connected with Monster M1; interconnect was Audio-Quest LiveWire Lapis. Source components consisted of a Linn Troika/Ekos/Sondek LP player sitting on a Sound Organisation stand, the new Philips LHH1000 two-box CD player, its transport section also used to drive the Sony DAS-R1 D/A convertor, and my venerable Revox A77 open-reel recorder.

Regarding the choice of cartridge, I admit right from the start that the PV9's phono input is optimized for high-output MC or MM cartridges. I do have a second Linn set up with a Linn K-9 MM cartridge, one of *Stereophile's* Class C recommendations, but to be frank, upon trying it with the PV9, it was obviously outclassed. I therefore did some listening with the Troika's output voltage magnified by the Tim de Paravicini-designed *HFN/RR* Black

Head transformer, but for the bulk of my listening I used the Troika straight in, the noise being *just* low enough for me to get away with it, more so with the insensitive Celestions than with the Vandersteens. (The transformer noticeably degraded low-frequency control, as well as restricting soundstage depth. With the Vandersteens, it also resulted in restricted volume-control travel.) Hum aside, the noise via the phono input was very "pink," having an inoffensive soft, rushing character rather than an irritating HF peaky nature.

The problem here is whether you regard it the reviewer's duty to put together an optimally matched system around the component under review, or whether to stick with components with which the reviewer is familiar enough that a valid description of the test component's sonic attributes can be arrived at. In an ideal world, every reviewer would aim at the former, yet it is also true that changing more than one component at a time inevitably leads to confusion. I therefore focus my auditioning on the identification of the review component's sound; that way, owners and prospective purchasers can see if it fundamentally fits in with their tastes or not, and develop a shortlist of possibly complementary ancillaries.

Power amplification was initially provided by a pair of VTL 100W Compact Monoblocks. Using the Vandersteens, these proved to be far too sensitive for sensible use with the PV9, however, and their slight midrange forwardness didn't meld at all well with the intrinsic nature of those loudspeakers. I therefore conducted all my serious listening with my 1986-vintage Krell KSA-50, which both permitted a better estimation of the PV9's low-frequency performance, and allowed its volume control to be used in a sensible part of its range, between 8 o'clock and 12 o'clock for CD and 10 o'clock and 2 o'clock for LP (when the preamp was used with the Vandersteen speakers).

C-J's Premier Three preamplifier was the stimulus for Anthony H. Cordesman's famous comparison: "The SP-10 brings you closer to the music. The C-J is twentieth row center."<sup>2</sup> He didn't list in his review what recordings enabled him to reach this conclusion, but it has proved true as a guide to the nature of the traditional Conrad-Johnson sound: rather laidback, the highs suggesting a slight rolloff, as would

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<sup>2</sup> *Stereophile's* "Almost All-Tube Issue," Vol.7 No.3.



be natural from a seat a little farther back in the house.

This was precisely the overwhelming signature of the PV9 via the phono input. A wealth of detail was apparent, with astonishingly accurate image depth on recordings that possess the informational wherewithal. On the James Boyk Performance Recordings piano LPs, for example, the Steinway was set well back within the dome of Caltech's Dabney Hall ambience. Having heard Jim play there on the same piano, the sound via the tubed PV9 when reproduced over Celestion SL700s was astonishingly life-like, even small details of the piano sound and the performance being made clear. But that detail was not pushed forward at the listener in any way. Rather, as in real life, it was there when you needed it. I gained a suspicion that the image was a little less wide than I am used to via my reference preamplifier, but I wasn't consistent at identifying this.

Again via the phono input, the low frequencies were full, even *too* full when compared with the same recordings on CD. With the Celestion SL600s, this resulted in a sound that was too overblown, but with the Vandersteens, the result was a satisfyingly rich flavor to the bass. To draw a parallel with one my favorite interests—dessert—the Celestion/PV9 combination was profiteroles with just too much chocolate sauce,<sup>3</sup> while the Vandersteen/PV9 had just the right amount of chocolate to allow the delicate flavor of the *choux* pastry to shine through.

The highs were where the PV9 scored its highest points: delicate, unexaggerated, with instruments having just the right amount of edge to their sounds to allow their individualities to come through. I suppose that this is what that veteran tubeophile Dick Olsher would refer to as "tube sound." Well, I was certainly taken with it. Having used mainly solid-state designs for the last couple of years, perhaps it appears that the tube, or at least the triode, is still the best device for amplifying the output of an MC cartridge.

Let's you think I am ignoring the wood for all the interesting trees, the PV9's greatest strength via its phono input was the ability to blend all of these individual aspects together to form a musical whole. As with the Audio Research SPI0 (which in my opinion was the

greatest preamplifier ARC ever made), one LP just seemed to lead to another.

That's what it's all about, isn't it? It reminds me of something said by one of *Stereophile's* regular listening team here in Santa Fe, Michael Mandell, when he was listening to the PV9 over at my place one Saturday morning. Michael used to use a C-J PV5 but has recently replaced it with a Threshold phono amplifier/Mod Squad Line Drive combination. "You know," he said, "I am convinced that my current setup is more accurate. But listening to the PV9 reminds me that I don't seem to *enjoy* my records as much as when I used the PV5." That, I feel, is the essence of the whole debate that has been raging in these pages between J. Gordon Holt and myself. The typical solid-state phono preamplifier may be accurate regarding its portrayal of the surface characteristics of music, but a *good* tube design—and I have to add the modifier, there being a number of poor tube designs where it seems to be assumed that mere use of tubes will magically override any other shortcomings—somehow seems to be more true to the underlying nature of the music. Of course, there are solid-state exceptions—the Vendetta Research phono preamplifier, the Mark Levinson No.26, and the Mod Squad Phono Drive in effect combine the best of both worlds—but the PV9's almost archetypical portrayal of the benefits brought to LP replay by tube technology brings matters to a head.

Turning to the line stage, here I was able to carry out both comparisons with my reference Mod Squad Line Drive Deluxe, and to try some bypass tests, using my own master tapes as source. Here, the PV9 was not as impressive, for the signature it imposed on the sound detracted rather than added to the musical whole. Again, the somewhat narrow but deep stage was identifiable; again, the highs were sweet and the bass full. But the fact that I could detect these characteristics at all worried me, as surely the passive device (when use with short, low-capacitance interconnects) *must* be both more neutral and more musically accurate. Even if ultimately less enjoyable.

Mustn't it?

Again, the PV9 brings such philosophical matters to a head. Whereas I would confidently recommend it for LP replay (provided the correct balance can be struck between cartridge and loudspeaker choice, thus arranging whether

<sup>3</sup> My wife would like to state for the record that there is *no such thing* as "too much chocolate."

the noise level will be audible or not), I would stick with the Mod Squad control center for CD and tape replay.

You know what I would like C-J to produce: the PV9's phono stage on its own, the tube equivalent of the Vendetta or Mod Squad phono preamplifiers. That might give audiophiles the best of *both* worlds.

## Measurements

The most relevant measurement of a phono preamplifier, in my opinion, is the accuracy of its RIAA de-emphasis. Fig.1 shows that for the PV9. It can be seen to be commendably flat across the entire audio band, or at least within the tolerance of my inverse-RIAA network, gently rolling off above 16kHz and below 16Hz. The 1kHz squarewave of the PV9's RIAA stage is shown in fig.2, the flat top implying good LF extension, and the lack of overshoot, fast rise-time, and square corners indicating a flat, extended HF response. The line stage, too, was effectively flat, with -1dB points lying at 6.3Hz and 50kHz.

The specification implies relatively high levels of distortion when compared with a typi-

cal solid-state design, at less than 0.25% of both THD and IMD, this presumably due to the minimal amount of negative feedback used. THD at this level would certainly be audible if it consisted of high odd-order harmonics, but, if second-, third-, and fourth-harmonic, would undoubtedly pass unnoticed on music program.<sup>4</sup> This turned out to be the case, the distortion spectrum at 1kHz, for example, for a 4mV input consisting of approximately 0.3% second-harmonic, with smaller amounts of third-, fifth-, and sixth-harmonic. Even increasing the drive level to a point well above what could be reasonably expected from a typical MM pickup cartridge didn't significantly degrade this performance. Things were much the same at 20kHz: fig.3 shows the 20kHz waveform about 12dB below the onset of overload, with the output equal to just under 10V peak-peak: FFT analysis shows second-, third-, and seventh-harmonic to be noticeable, the latter very low in comparison with the first two. Once overdriven, the waveform started to triangulate rather than clip cleanly. The output at 20Hz was also relatively clean, despite the need for the circuit to provide 20dB or so more gain than at 1kHz. Phono input overload levels, assessed at the tape-out sockets, were moderate at 8.8mV (20Hz), 88.7mV (1kHz), and 1V (20kHz), while with the volume control wide open, it took 400mV input to clip the line stage, the maximum output level then reaching 18.51V RMS.

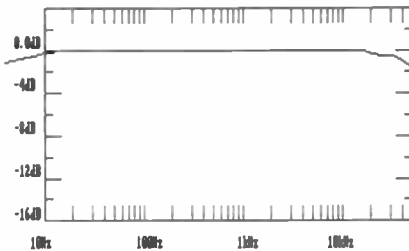


Fig. 1 PV9 RIAA error

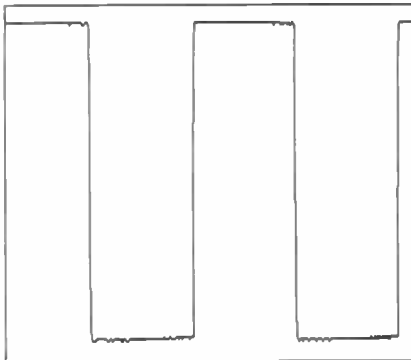


Fig. 2 PV9 1kHz squarewave response, phono input

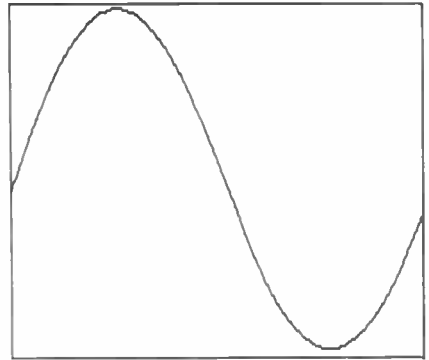


Fig. 3 PV9 20kHz at 10V p-p output, phono input

<sup>4</sup> The signal generator I use for everyday response and impedance measurements has a trim pot to minimize harmonic distortion. On a good day (and that is by no means every day), I can trim it by ear to about 0.75% of third-harmonic, but I have never been able to hear low-order harmonics superimposed on a pure tone that are any lower in level than this.

Backing off the volume control will increase the line-stage overload margin to infinity, of course.

Residual line-stage noise lay at around  $-69$ dB (unweighted) ref.  $2.5$ V output. The phono input was a little noisier than specified, with  $60$ Hz hum apparent at  $-61$ dB ref.  $10$ mV input at  $1$ kHz. This was only just audible at the listening position with the low-output Linn Troika in use via the Vandersteens, and will be inaudible with a high-output MC or MM cartridge. It also couldn't be heard via the  $8$ dB-less-sensitive Celestions. (A caution for those like myself who like to poke around inside components: the disc input hum level rises considerably with the aluminum top-plate removed.) Separation via the phono stage was less good than I would have thought desirable, and might correlate with the subjective feelings of rather narrow stage width (though it could be fairly pointed out that these figures are still better than any high-quality cartridge). At  $20$ Hz, separation with the appropriate input shorted measured  $45.5$ dB,  $44.7$ dB at  $1$ kHz, and  $33.6$ dB at  $20$ kHz. Line-stage separation was also less good than normal, at  $50.5$ dB at  $20$ Hz and  $1$ kHz, worsening to  $45.2$ dB at  $20$ kHz.

The phono stage sensitivity measured  $46.4$ dB,  $2$ mV in at  $1$ kHz, giving  $420$ mV out from the tape-out sockets. The line stage gain was also to spec at around  $31$ dB. With such a sensitive line stage—following in a C-J tradition, I remember J. Gordon Holt complimenting the PV5 on the fact that it had “scads of gain”—good volume-pot tracking must be considered essential, as the control will often be used toward the bottom of its rotational travel. The ALPS component used by C-J was exceptionally good in this respect, which is just as well. The two channels rarely differed by more than  $0.2$ dB between  $5$  o'clock and  $9$  o'clock, with only  $1$ dB difference apparent at  $7$  o'clock, when the music was so quiet, even from CD, that you wouldn't really care about channel bal-

ance. Finally, I measured the preamp's output impedance to be a little higher than spec, at approximately  $360$  ohms. This still means that the PV9 should be relatively unfazed by longish leads and low power-amplifier input impedances, however.

## Conclusion

Beautifully constructed, with high-quality components used throughout, Conrad-Johnson's PV9 is the very epitome of a modern all-tube preamplifier. I must admit that I started the review feeling irritated with what I felt to be arbitrary design idiosyncrasies: its lack of a true MC input; its perverse tape-monitor arrangements; its too-high sensitivity on its line inputs, leading to a restricted action on the volume control; and a line stage that was not as neutral as I would have thought essential at this price level. Yet, as record followed record and CD followed CD, even I had to own up that I was enjoying everything I heard. As the garage-sale incident indicates, my LP-buying habit started to increase in frequency—always a good sign that something good is happening—and I was truly sorry when the PV9 had to be replaced in its shipping carton.

The PV9's tonal balance will require some care in choosing components that will complement rather than reinforce its own idiosyncrasies. It matched the Vandersteen 2Ci's much better than it did the Celestion SL600Si's, for example, the latter combination being too dark too much of the time. It will also mate well with cartridges that are themselves rather forward in balance; the Talisman Virtuoso DTi, for example. Me, I find myself playing CDs often enough that I find the degree of line-level transparency coupled with neutrality offered by the Mod Squad's Line Drive Deluxe to be essential. But if you favor LP over CD, and use a reasonably high-output MC cartridge, then the PV9 will offer a consistently musical performance commensurate with its high price. **S**

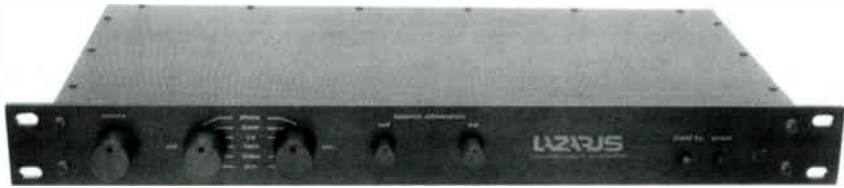
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# LAZARUS CASCADE DELUXE PREAMPLIFIER

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Dick Olsher

Tube preamplifier with hybrid solid-state/tube phono design. Frequency response:  $20$ Hz– $20$ kHz,  $+0/-1$ dB. High-level sensitivity:  $100$ mV in for  $1$ V out. Phono sensitivity:  $0.2$ mV for  $0.5$ V output



### Lazarus Cascade Deluxe preamp

at 1kHz. Phono overload: 50mV (no frequency specified). Phono input impedance: adjustable from 26 ohms to 47k ohms in 8 steps, in parallel with 25pF. Line input impedance: 100k ohms. Measured output impedance: 1030 ohms. Dimensions: 19" W by 10" D by 2" H. Sample tested: SN 2062. Price: \$1199. Approximate number of dealers: 30. Manufacturer: Lazarus Electronics, 8130 Coldwater Canyon, North Hollywood, CA 91605. Tel. (818) 982-6477.

The Lazarus, a slim, quite elegant unit finished in black with red and gray legends, lived up to its advance billing: it literally rose from the dead! Out of its coffin (*ie*, shipping box) and plugged into the wall, it showed no signs of life. Troubleshooting revealed a blown AC mains fuse. That in itself was not a major problem, but what worried me was the root cause of the trouble. Preamplifiers as a rule are not power-hungry, so a current surge at turn-on sufficient to destroy the 250mA slow-blow mains fuse appeared symptomatic of a major circuitry failure. After describing the problem to Greg Miller of Lazarus at the recent winter CES, however, I learned that the unit was improperly fused, and that a 500mA fuse was in fact required for the Cascade Deluxe. Apparently, Lazarus's Cascade Classic design uses a 250mA fuse, so with two different fuse types circulating in the factory it was only natural (Murphy's Law) for my sample to arrive with the wrong one.

Aside from the QC implications of the above episode, there is another potential problem with this unit. I say potential because it is dependent on the AC line voltage in your area. The Lazarus will automatically go into "standby" mode and mute the outputs if AC power conditions go too low for satisfactory operation. What is too low, you ask? Well, according to Lazarus, early production was set to trip into mute at 110V—which is actually a normal line voltage for many urban areas. Fortunately, this problem can be corrected by merely tweaking a single pot. The pot is easy to find—it's the only one on the main PC board, just to the left of the flat-profile transformer.

With a 500mA fuse in place, the Lazarus came to life, its two pairs of 12AX7As awash with a wholesome glow. (The tubes are mounted on a vertical sub-board, allowing them to be

mounted horizontally.) The next order of business was adjustment of the phono input impedance. Because I was using Sumiko's Virtuoso DTi at the time—a high-output MC—I wanted to verify that the phono input impedance had been set to 47k ohms (supposedly the preamp's factory setting). Yet another minor irritation confronted me. I discovered that the input impedance was set to 100 ohms. This should have been easy to reset via a bank of DIP switches, except that these switches proved more difficult to manipulate compared to similar devices in other preamps. Using a thin flat-blade screwdriver, I was finally able to slide the switches into the required open/closed sequence. (A ballpoint pen also does the trick.)

With this one exception, the quality of the parts used appeared to be quite decent considering the price point. For example, gold-plated Tiffany RCA jacks are used at the phono and CD inputs and the main outputs—a really nice touch—and audiophile-grade capacitors are used in the signal path, including polystyrenes and WIMA polypropylenes in the RIAA network. (Though the volume-control pot is a relatively inexpensive component.) Both the tube heater supplies, as well as the plate voltage rails, appear to be regulated.

The hybrid designation of the preamp is due to the fact that just to the front of the DIP switches are two parallel arrays of four 2N4222 metal-can transistors, one array for each channel. These allow the tube circuit to have sufficient gain to cope with moderate-output MC cartridges without incurring too much of a noise penalty.

In addition to the phono input, a total of four high-level inputs and one tape loop are provided. By popular demand, this unit *does* have a power switch, although Lazarus still recom-

mends that the unit be left on at all times unless it is to remain unused for an extended period. It is also possible to switch the Lazarus into "standby" or mute mode with a front-panel push-switch instead of leaving it fully powered, thus further increasing tube life while keeping the circuitry reasonably warmed up. A relay mutes the outputs in this condition. However, Lazarus claims that even under full-power conditions the tubes will last, conservatively, one year. Individual balance controls are provided for each channel. When not in use, these controls may be "clicked" to the off position, which takes them completely out of the signal path.

One final note: The front-panel LED is controlled by the standby switch, not, as you might expect, by the power switch. This is a bit confusing at first, but ultimately it really does not matter: it's pretty difficult to visually determine the condition of the LED anyway, it being very dully illuminated; it is best to just remember the proper switch positions.

My first sonic impression of the Lazarus was gleaned via my John Koval-modified Quad ESLs driven by a pair of Don J Cochran Delta Mode amplifiers. The front ends throughout the listening sessions consisted of the Sony PCM-F1, the SOTA Star Sapphire turntable atop an Arcici Lead Balloon, the SME Series V tone-arm, Sumiko's Virtuoso DTi cartridge, and Cardas and Cogan-Hall Intermezzo interconnects. The Lazarus had already been burned-in for over a week.

One sonic idiosyncrasy that quickly became evident was the Lazarus's abnormal sensitivity to polarity inversion or absolute phase. And I don't mean this in a complimentary sense, as if the Lazarus were somehow more clearly revealing of phase errors compared to other preamps. In my experience, a polarity reversal (equivalent to a 180° phase shift) produces small but clearly audible effects. Generally, the sonic areas affected are timbral accuracy, loudness, and soundstage focus. One or more of these attributes changes for me when polarity is reversed. I personally find voice to be the most effective instrument in locking onto the "correct" polarity. The voice box and diaphragm are much more clearly resolved with the "correct" polarity, and the vocal-tract sound appears to radiate from a fairly well-defined point in space. This specificity disappears with incorrect polarity so that the core of the voice cannot be precisely localized

within the spatial outlines of the singer. In other words, the chest and voice box are homogenized, spatially diffused so that it is difficult to locate the singer's mouth.

This effect was exaggerated with the Lazarus. In fact, improper polarity brought about extreme side effects. Not only was focus affected, but the upper octaves became intolerably bright with incorrect polarity, and instrumental harmonic envelopes were rougher sounding. It became mandatory to choose correct polarity for every recording, which I did by shuffling speaker connections—something I don't enjoy much anymore after last July's loudspeaker cable survey.

If I somehow implied that the brightness of the Lazarus vanished under "correct" polarity conditions, let me correct that impression. Even under the best of circumstances, there was a noticeable residue of "tube glare" in the phono stage which affected the upper mids and lower treble. The treble was spacious and open, but treble transients were slightly out of control (read: "zippy"). With the Celestion SL600s this resulted in an overly sibilant presentation. How annoying these colorations will be will depend to a great extent on the contributions of your ancillary equipment. With either a bright MC cartridge or a bright/overly etched speaker, I would be unable to tolerate this Lazarus preamplifier for any length of time.

Having gotten the bad news out of the way, I should tell you that in many respects the Lazarus performed exceptionally well. Analog program material was consistently very detailed. I had no problem, for example, clearly resolving the numerous (and very annoying) pre-echoes on *Die Zauberflöte* (London OSA-1397) with Georg Solti conducting the Vienna Philharmonic. The soundstage was spacious, with hall reverb cleanly reproduced within stage dimensions of excellent width, depth, and realistic height perspective. Instrumental outlines were almost palpable in extent, yet tightly focused in space.

Neither did I expect this level of midrange transparency in a \$1200 preamp, though the Cascade Deluxe did just perceptibly veil the soundstage—no matter how transparent the program or speaker I threw at it. Together with the aforementioned upper-octave brightness, these qualities lent the midrange of the Lazarus a clear/clean and slightly light weight character (at least through the phono stage), the apparent

tonal balance being tipped toward the treble. I'm not suggesting that the mids were analytical in nature; they were not. There was actually a hint of romantic sweetness in the air. It's just that the lower mids were a bit fluffy and lacking in heft.

Another strong suit of the Lazarus was reproduction of the bass registers—especially in the mid- and upper bass. Pitch definition was generally excellent. The body and flavor of the bass guitar on cut A2 of the Opus 3 *Test Record 1* were very nicely captured, as was the timbre of the double bass on cut A1.

Complex orchestral passages did not slow the Lazarus down. There was no audible congestion or reduction in resolution level. Massed voices remained clearly resolved, and dynamic shadings maintained linearity from soft to loud.

I've left the best news for last. The line-level section of the Lazarus is much better than the

phono stage, at least on the basis of the Lesley Test. Lesley, my spouse for over 20 years, is also a professional singer and, with Leigh Berry, a member of the duo "Platinum and Gold." My Sony PCM-F1 recordings of Lesley have provided me with an invaluable tool for assessing the sonic merits of audio gear. Being intimately familiar with Lesley's voice and with the recording process has given me a personal "absolute" reference for discriminating sonic differences. These master tapes have enabled me to quickly and reliably elucidate the effects of equipment under test—at least in the frequency bandwidth covered by a soprano. Lesley's voice was clean, detailed, and focused. But most important, and in contrast with the phono stage, the tonal balance was much more natural. Much of the brightness of the phono section was gone; not *entirely* gone, mind you, but sufficiently reduced to the point of long-term tolerance.

### An Absolute Sidebar

Why should the Cascade Basic be so sensitive to polarity reversal? I can only speculate and point an accusing finger at the possibility that inherent phase-response errors are compounding the effects of polarity reversal. A nonlinear phase response will produce a frequency-dependent phase shift of harmonics in a complex tone, the end result being a distortion of the signal waveform. So the broad issue is whether the auditory system is sensitive to waveform distortion or to changes in waveform slope (a polarity reversal changes the slope of the signal; *ie*, a compression with positive slope is presented as a rarefaction with negative slope. By now there exists a massive body of scientific literature that supports the audibility of monaural phase effects (the technical name for this phenomenon), although the biological basis for it has not yet been pinned down.

Clark Johnsen, in his book *The Wood Effect* (see September 1988, p.5), paints Helmholtz as being partly responsible for the current indifference to absolute polarity because of the latter's influential view that the ear is "phase deaf." This is based on Helmholtz's famous dictum that "... differences in musical quality of tone depend solely upon the presence and strength of

partial tones, and in no respect on the differences in phase under which these partials enter into combination." Thus, the ear/brain is supposed to act strictly as a spectrum analyzer without regard to waveform. In truth, Helmholtz did hedge his phase rule by stating that harmonics beyond the sixth to eighth do produce dissonances and beats that make a phase effect possible, at least for these higher harmonics. I find it remarkable that anyone in the middle of the 19th century could study phase effects at all, and I think that Helmholtz's findings are quite consistent with the severe limitations of his non-electronic, purely mechanical apparatus. For Johnsen to imply that somehow Helmholtz impeded the progress of perceptual acoustics is about as credible as to claim that Newton impeded the development of relativistic physics.

The next significant milestone in the study of phase was the work by Mathes and Miller at the Bell Telephone Laboratories in 1947. They found that the envelope-wave shape of a complex steady-state tone is an important factor in the perception of tone quality: roughness *vs* smoothness and a sensation of apparent pitch. As waveform shape depends on the phases as well as the amplitudes of the components, the above perceptual differences could be produced

As should be obvious by now, in some respects the Lazarus Cascade Deluxe will not be embarrassed by any preamp out there, regardless of cost. It is transparent, dynamic, retrieves inner detail very well, and images with excellent focus and spatial resolution. Unfortunately, the huge fly in the ointment is its tonal balance via the phono inputs. The sound is significantly *bright* and the treble a bit zippy, and if you fail to carefully watch signal polarity, these problems can mushroom to unbearable proportions.

So what do I make of these mixed findings? Relying as heavily as I do on analog program material, I find the tonal balance of the Lazarus irritating in the long run, and thus cannot recommend it. However, I will allow one exception. If you're primarily looking for a good tubed line-level section (eg, to play back CDs or tapes), then on the strength of its line-level stage the Lazarus merits an audition. **S**

## Editor's postscript

Intrigued by Dick's description of the Lazarus preamp's phono stage as having "zippy" treble transients, I ran a low-level 1kHz square-wave through the magazine's inverse RIAA network into the Cascade Deluxe's phono input (set to 47k ohms impedance). Fig.1 shows the result at the tape output sockets: excessive leading-edge overshoot which will certainly lend an "etched" quality to the sound in the treble, as well as exaggerate the audibility of disc surface noise. Note also the slight uptilt to the plateau of the waveform, implying too much upper-bass energy. The relatively "square" shape to the 1kHz waveform, however, indicates that if the Cascade preamp does have phase problems, as postulated by Dick, they will be much lower in frequency.

To confirm these findings, I ran a conventional response curve, again measuring the out-

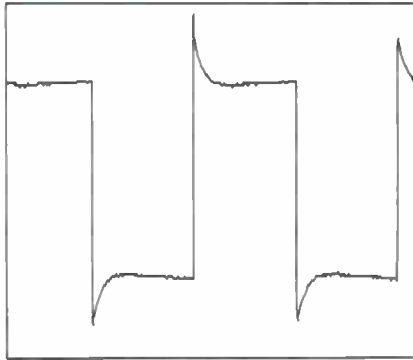
by changes in phase alone of even a single component or group of components.

In 1962, Craig and Jeffress reported work conducted in the footsteps of Charles Wood, who, in 1957, while at the Defense Research Laboratory, informally discovered the audibility of polarity inversion. They found that listeners could consistently assign different sensory qualities to different phase relations. However, a surprising finding was that certain combinations of phase and level in complex waveforms produced a tone which, when reversed in phase, sounded higher-pitched, louder, or purer to some listeners, and lower-pitched, softer, or less pure to others. Note that a phase reversal of the complex tone would reverse the subjects' judgments, but would still leave them in disagreement. Hence, it would appear that there are significant individual differences in the perception of phase, and that the concept of "absolute polarity" seems to be in jeopardy. A polarity that improves the sound quality for me may produce the opposite result for someone else.

Another important caveat about observing phase effects in the "real world" has to do with the listening room. Typically, phase effect experiments are done with headphones so that room effects are eliminated.

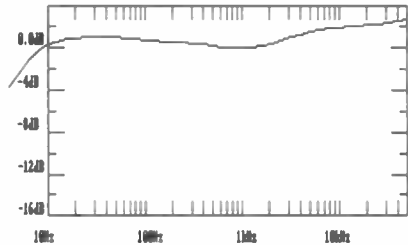
In a reverberant environment, strong room reflections will sufficiently alter the direct signal waveform to mask phase effects at the source: If your room is alive, you may have a difficult time discerning polarity reversal. This is another good reason to treat your room. You might even wish to defer purchasing that expensive speaker cable you've been lusting after in favor of wall-absorptive treatment.

Craig and Jeffress go on to offer several theoretical possibilities for explaining the ear/brain's phase sensitivity. There are indications that the waveform of a complex tone, by effecting small changes in the particle movement of the cochlear fluid, is able to shift the place of maximum excitation along the cochlear membrane, which would account for timbre changes due to phase. There is also some evidence that the steepness of the waveform affects the sensation level. The great Bekesy, for example, found while investigating beats between a squarewave and a sinusoid that a more intense sensation was associated with the steeper wavefront. Another possible mechanism involves phase-related changes in the temporal response of neural stimulation. The neural response in the basal turn of the cochlea may be strongly affected by the waveform and signal steepness. —DO



**Fig. 1 Lazarus phono input, 1kHz square-wave response (2ms window)**

put from the tape-out sockets: fig.2 shows that the entire treble hinges up both above 1kHz, where it rises by 2.7dB at 50kHz, and below, with a maximum of 1dB boost in the low bass. In practice, the phono input brightness will be ameliorated a little by the fact that the Lazarus's line input starts to roll off above 10kHz, reaching 0.6dB down at 20kHz, but the fact remains that this preamplifier has a decidedly non-flat response through its disc input, something that



**Fig. 2 Lazarus RIAA error**

in my opinion just shouldn't happen in a 1989-vintage, \$1200 preamplifier. As many MC cartridges already have a depressed midrange, the Cascade Deluxe will add to this tonal idiosyncrasy, exaggerating the degree of cartridge-sourced coloration.

I also checked the disc-input overload margins, to make sure that added distortion wasn't exaggerating the bright sound. These were all pretty good, however, at 13.5mV, 156.3mV, and 447mV at 20Hz, 1kHz, and 20kHz respectively (all figures true RMS). As with the Conrad-Johnson PV9 reviewed in this issue, the 20kHz figure is approximate as the sine wave could be seen to triangulate—*ie*, suffer from slew-rate limiting problems—before severe clipping was noticeable.

—John Atkinson

## AUDIOPRISM 7500 INDOOR FM ANTENNA

Don Scott

Passive antenna using "J" configuration. Gain: 5.1dB. Vertically polarized. VSWR: 1.9 or less, 88–108MHz. Dimensions: 89.5" H, tube diameter 4", base diameter 17" with F-type connector. Tube coverings: black or beige; custom fabrics available. Weight: 9.2 lbs. Price: \$150. Approximate number of dealers: 50. Manufacturer: RF Ltd., PO Box 1124, Issaquah, WA 98027. Tel: (206) 392-0399.

One of the problems with FM reception is the exact location of the receiving antenna. You may have noted, while waiting at a stoplight listening to your car radio, that by moving only a foot or so an FM station can go from weak to perfect reception. The same is true in a home, particularly if there are large metal objects, wiring in walls, or other signal conducting/reflecting services nearby. Therefore, to give the most honest evaluation of this antenna, it was tested in several locations in four different homes (one

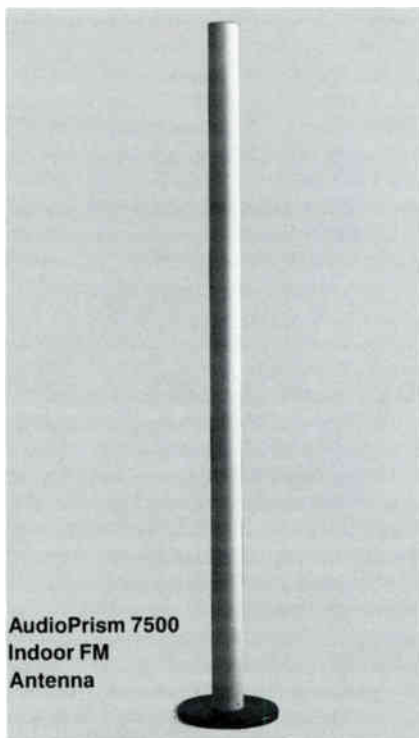
with aluminum siding, three without) and in a steel-framed audio showroom. Elevations ranged from 80' to 450' above sea level.

The 7500 sports 5.1dB gain using a "J" design, and is a non-amplified, vertically polarized, omnidirectional antenna. The "J" designation means it consists of two vertical rods, one about 2.5 times the length of the other. The feedline and matching stub are attached near the bottom of both rods at the best match points, and an additional aluminum-foil



ground plane is used on the underside of the wood base. However, because of the location factor mentioned above and the consideration that signals approach an antenna at different angles, I did not find this large antenna to perform any signal-catching magic. For instance, compared with the new Terk 9600 Pi amplified disc antenna, the horizontally polarized, amplified BP FM-9700 antenna (reviewed in Vol.11 No.2), and the non-amplified GC Electronics "Superior" antenna (Vol.9 No.8), it emerged that each has its merits; there was no definite winner for anyone unable to use a good roof-mounted antenna. The Terk had the highest signal strength on stations that were already of medium to high signal level, the BP was the only choice when good directivity was needed, and the GC equalled the 7500 at receiving the weakest stations. *But*—the advantage of the floor-standing 7500 is that it can be placed more easily in the spot that yields the most signal. Another advantage is that, in some instances, amplified antennas will intermodulate (mix) strong in- or out-of-band signals with the desired one, causing distortion or bogus frequencies to appear. In addition, amplified antennas are apt to pick up hum and noise from fluorescent lights and appliances.

All in all, the AudioPrism 7500 is worth a try. (So are the other products mentioned.) It just might be the perfect antenna for capturing enough signal to make that favorite, noisy station worth listening to. And its unobtrusive design will be welcomed in many installations where an outdoor antenna is not feasible. The antenna also has application in dealer showrooms where an outside antenna is prohibited.



**AudioPrism 7500  
Indoor FM  
Antenna**

In this manner various FM tuners and receivers can be evaluated with a stationary antenna/signal rather than with flimsy wire antennae draped in unequal positions behind each unit. The only factors left to consider are cost/performance and height requirements. The answer is "Yes" if this is the only antenna that will perform satisfactorily in a given location, and if there are no low ceilings on your budget or residence. **S**

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## SONY DT-10 DISCMAN WITH AM/STEREO FM DIGITAL TUNER

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**Bill Sommerwerck**

16-bit, 2x-oversampling linear CD player with digital filter: Frequency response: 20–20kHz  $\pm$ 1dB. S/N ratio: greater than 85dB. Tuner: FM tuning range: 87.5–108MHz, in 100kHz steps. FM sensitivity: 16dBf. FM S/N ratio: 50dB. AM tuning range: 530–1650kHz in 10kHz steps. General: Line output level: 1.3V into 50k ohms. Line output minimum load impedance: 10k ohms. Power output: 15mW/channel into 32 ohms. Power consumption: 1.8W (CD player). Maximum playing time: 4.5 hours CD, 10 hours tuner (with BP-100 pack); approximately 35% increased time with optional BP-200 pack. Accessories supplied: BP-100 battery pack; AC power supply/re-charger; soft carrying case; neck strap; stereo mini-plug to stereo RCA cable. Significant accessories: BP-100 and BP-200 lead-acid battery packs; RM-DM1K infra-red cordless remote control



### Sony D-T10 CD/FM Walkman

kit (transmitter & receiver). Dimensions: approx. 1.1" (28mm) by 5" (127mm) by 5.25" (133mm), including projections, controls, and BP-100. Weight: 500 gm (with BP-100). Approximate number of dealers: 2000. Price: \$380 (discounts readily available). Manufacturer: Sony Consumer Products Co., Sony Drive, Park Ridge, NJ 07656. Tel: (201) 930-1000.

Back in 1986, I reviewed the Sony D-7S Discman, the first portable CD player with a bottom-mounted lead-acid battery pack. Though less than featherweight, it eliminated the even greater weight and bulk of the D-5's rear-mounted battery pack, which took only C cells. The D-7S was my staunch companion on business trips and at work, and absolutely irreplaceable during hospitalization. In two and half years I put only about 100 hours on the D-7S, but in November of 1988 it started skipping and mistracking like a Decca pickup playing a direct disc of *castrati*. Cleaning and lubricating the sled gear gave me another 20 hours of use, but further attempts at resuscitation were ineffective. The local Sony office estimated the repair at \$150, admitting the D-7S "was not as reliable as the D-5."<sup>1</sup> (This price included replacement of every component in the pickup assembly, the D-7S's Achilles' heel.)

"The unit is only two and half years old!

What am I supposed to do, eat it? Do I look like Lieutenant Data?"

"Well, you can buy a new player for half price if you'll return the defective player." Many consumers forget they have legal rights, one of which is "a product of average quality." A not-very-old unit that requires expensive repair is *not* "of average quality" and you are *legally* entitled to compensation. Since a portable CD player ought to be good for about five years of moderate use, Sony's half-price offer was reasonable. I needed the unit badly (I listen to light, fluffy stuff at work, like *Das Lied von der Erde* or *Elektra*), so I requested a DT-10. I returned the D-7S, keeping the case, power supply, and BP-200 battery pack; I suspected they'd be useful with the new unit.

The DT-10 arrived toward the end of January. It is broadly similar to the D-15 that so impressed Sam Tellig last September (Vol. 11 No. 9) with a digital tuner in the lid. This makes the player as tall as the D-7S at the rear, but the lid tapers toward the front, where the unit is

<sup>1</sup>JA says his well-traveled D-7S recently died, too.

barely thicker than the D-15. The cosmetics are typical of Sony—clean and unfussy. It's a handsome product.

Unlike the D-15, the DT-10's BP-100 battery pack clips to the bottom. Although you gain thickness, you also gain playing time: 4.5 hours from a full charge, *vs* only 2 hours from the snap-in pack for the D-15. Although you can carry spare packs for the D-15 (and Sony makes a separate charger so you won't be caught short), the longer playing time of the BP-100 obviates the extra packs.

Best of all, you can put the D-7S's BP-200 pack on the DT-10 (and the combination fits perfectly in the D-7S's carrying case). With 35% greater capacity, the BP-200 delivers an unprecedented 6 hours playing time for CDs. Eat lead, wimpy snap-in battery.

The controls are much like the D-7S's, so I won't rehash every one. There is no power switch *per se*, but a button that turns everything off. Pressing the CD Play or Tuner On buttons activates the unit (and shuts off the other source if it was playing). A slide switch at the right rear disables all the other buttons so you can't accidentally turn the unit on or off. The carrying case is vinyl-coated fabric (I'd give it a carry, tops) with either holes for jacks and knobs, or markings for the buttons underneath. You can operate everything without removing the case.

The CD player has the usual skip and scan functions, though they use the same buttons; the "key" button switches between their two uses. You can program up to 21 randomly selected tracks, or select shuffle play, which plays every track in random order. There are three repeat modes: the whole disc, a single track, or points A to B.

You select the tuner by pressing the Tuner On button; repeated presses toggle between the FM and AM bands and recall the last FM or AM station received. Tuning is manual or automatic, using the CD player's skip/scan buttons. There are 10 tuner presets, backed up with a lithium cell; pressing the + or - Preset buttons steps up or down through the presets. The word "stereo" appears in the LCD when a stereo station is tuned in.

Although the D-7S was well-made, the DT-10 seems even sturdier; perhaps it's the weight of the tuner in the lid. The controls also seem tighter and more precise, and the lid snaps closed more crisply.

## The CD player

The DT-10's CD player starts and stops more quickly and accesses tracks with greater alacrity than the D-7S, yet it draws less current. This improved efficiency permits a slimmer, lighter batter pack. The only penalty is a louder, higher-pitched whirr when running. This noise is slightly audible through open-backed headphones when sitting near the player. The DT-10 is considerably noisier than the D-7S when skipping to a new track or scanning.

One of the CD player's best features is "auto-recovery." The player keeps a record of the track playing and the time within the track. If a jolt causes tracking loss, the player returns to the last recorded position. I banged and shook the DT-10 vigorously to test this feature. Although the player sometimes muted for two or three seconds, it never failed to return to its pre-jar position, right down to the second.

The sound quality of the DT-10 (as suggested by the Cheapskate's review) is quite good. Compared to my Denon DCD-3300 (which used to appear in Class B), the DT-10 has a narrower, shallower soundfield, and lacks the open sound of the Denon. It is, however, clean and smooth at the top end; there are no irritating artifacts. Although I can't agree that the DT-10 might be "the only CD player you'll ever need," it is a creditable product that would probably be comfortable in Class D. These days, a Class D CD player is not so bad.

The DT-10 had no trouble with any of the variable pitch/variable speed "torture tracks" of the Pierre Verany test disc. Ditto for the signal-detection tracks. The DT-10 handled the first eight dropout tracks without any trouble (five more tracks than the CD standard requires). The remaining six were plagued with increasing amounts of skipping and muting. This is pretty good performance; however, most home players play these bands *without* skipping, even though they still mute. The first four of the seven successive-dropout tracks caused no problems (a player is only required to handle the first two).

In my review of the Sony MDR-CD6 headphones in Vol.10 No.9, I remarked on their propensity toward a fat bass and rolled-off highs, especially with the D-7S. I attributed this to the relatively high output impedance of the D-7S, which interacted with the headphone's bass resonance to create this imbalance. I was happy to note that the MDR-CD6 sounds far

more balanced with the DT-10. Almost all of the bass fatness and treble darkening are gone. I now feel comfortable recommending these headphones with the DT-10 or D-15. Of course, whatever headphone you select, be sure to listen to it with the player, to be sure it sounds good to *you*.

## The Tuner

Let's put this courteously. The tuner is (ahem) not very good. It's the kind of digital tuner that gives digital tuners a bad name.

Sensitivity is okay. Using a pair of Sony MDR-CD5 headphones as an antenna (the usual configuration), I counted 22 receivable stations in the Seattle suburbs. This is about three or four less than my Denon TU-800 with a BIC Beam Box. Not bad performance.

Selectivity, though, is horrible. Tuned to an empty adjacent channel, the main channel is down about 10dB, and very distorted. Although that's rather poor performance (even mediocre tuners have about 30dB alternate-channel selectivity), it's not surprising. High adjacent-channel selectivity is hard to achieve at any price, and the FCC normally assigns FM stations on alternate channels to mitigate this problem. What *is* surprising is that alternate-channel selectivity is even *worse*. (It ought to be better!) The bleed-through is down only 6dB or so!

All this wouldn't be so bad if it weren't for the weak-signal performance. The tuner actually sounds quite good on strong signals—clean and full-bodied. (Like a fine wine, *non?*) Except for its rather dull top end and narrower soundstage, I had trouble distinguishing it from my Denon TU-800. On weak signals, though, it's really grundgy-sounding. And guess which stations are the ones I most often listen to? Uh-huh.

I've owned several Sony FM Walkmen, including the very first (the SRF-80W) and the analog tuner in the teensy WMF-10 cassette player. None has sounded so bad on weak signals. This may seem like harsh criticism, but a portable tuner has to be better (in some ways) than a component tuner, and the DT-10's doesn't cut the mustard when the going gets tough. If good radio reception is important to you, make sure the DT-10 can properly receive your favorite stations before you buy it.

## The Remote Control

There's an optional remote control for Sony's

best Discmen, called the RM-DM1K. (Don't confuse the RM-DM1K with the RM-1K1K for the CDP-70.) I called J&R Music World and received it within a few days for a grand total of \$45 plus \$5 shipping.

The RM-DM1K works with the DT-10, D-15, and (presumably) any future Discmen with a blue remote-control jack. A tiny IR sensor module plugs into this jack; a protrusion on the player and a matching hole on the module keep it from rotating. The module sits high enough that the strap-mounting ears on the BP-200 don't get in the way.

The transmitter has the long, narrow styling typical of Sony remote controls. It's powered by two AA cells, and an LED at the top lights when any button is pressed. A slide switch selects between CD and tuner control.

With regard to tuner control, the instruction manual for the RM-DM1K has one of the most quaintly inane remarks of all time: "On some models having a remote control jack, no radio sound is heard even if the CD/TUNER switch is set to TUNER." *I.e.*, "some models" don't have tuners.

Without going into detail, suffice it to say that the RM-DM1K duplicates nearly every control on the DT-10, and does so *directly*. That is, there are separate buttons for the repeat modes, separate skip and scan buttons, and a keypad that permits direct selection of CD track and tuner presets; you don't have to press a prefix key to change operating modes, or repeatedly punch a button to select a track or station. Even when sitting at arm's length from your DT-10 or D-15, you may find the RM-DM1K more convenient than "reaching out and touching." (In fact, that's the way I use it at work.)

Some functions are missing. You cannot program the CD player, read the remaining play time, or assign the tuner presets; Sony probably felt these are better done at the player, where you can see the LCD. Surprisingly, tuner operation is limited to the presets; you cannot change bands or scan with the remote. This is especially odd, since the play and skip buttons (which would logically be used for band selection and scanning) still make the transmitter's LED light in tuner mode. My guess is that these functions were included in the transmitter's chip but deleted from the player's remote-control decoder.

Sony remote controls are my favorites because they operate at almost any distance from,

or angle to, the device they control. I could stand 10' from the DT-10 and point the remote *behind* me, and it still worked.

### Recommendations

The DT-10 has a good-sounding CD player that you won't be embarrassed to play through your main system. The tuner sounds good, too, if it gets a strong, clean signal.

How, then, to choose between the D-15 and the DT-10? The D-15 is slimmer and lighter, but you have to carry additional battery packs if you want more than 2 hours' playing time. The BP-100 gives 4.5 hours and the BP-200 up to 6 hours of playback; you would have to carry two extra D-15 battery packs to get the same playing time. Although the tuner doesn't perform as well as many separate Walkman-type radios, it's built-in and always available. *Cbacun à son goût.* **S**



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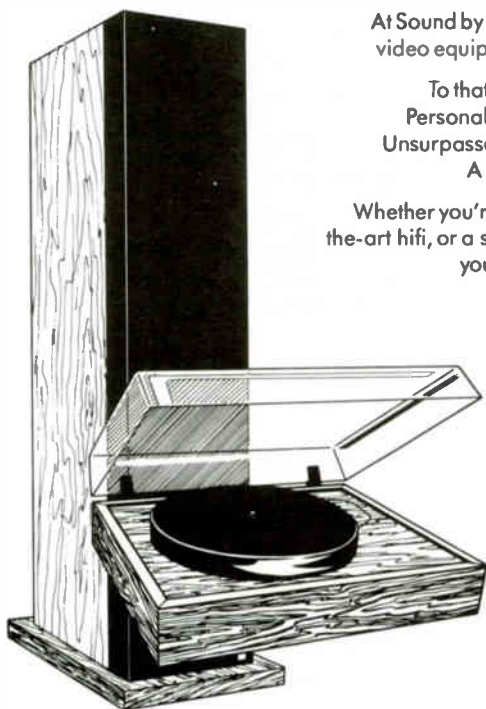
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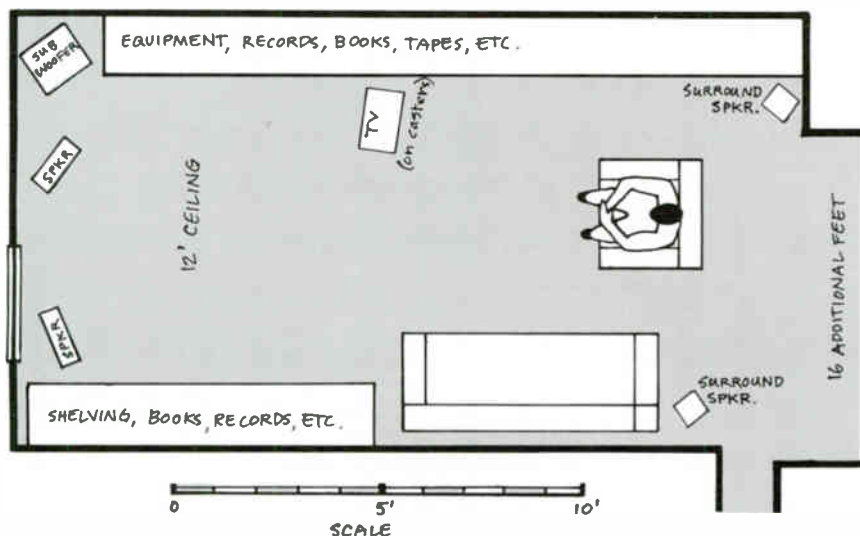


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# A MATTER OF TASTE



## RICHARD SCHNEIDER

**M**y musical tastes were formed by early live exposure to Chicago Symphony concerts during the Reiner era, at Orchestra Hall and Ravinia. To this day, I prefer to sit where I sat then: In Orchestra Hall, the top-most balcony is called the Gallery, and even in the post-renovation period, this area has the greatest number of seats in which the sound of the orchestra naturally coalesces into the blend characteristic of accomplished ensemble playing from any great orchestra. This condition varies from one hall to another, but, generally speaking, I prefer balconies, with a well-centered main-floor seat being a close second choice.

I majored in music in college and have done quite a bit of professional playing, and some recording. From 1963 to '68, I played tuba with the Israel Philharmonic. I came to New York to freelance in 1968, with moderate success. At this point, playing is only one of several things I do for a living. Since October, 1987, I have been the Classical CD Buyer at the Tower Records Uptown store in New York.

In case anyone suspects of me a vested interest in promoting CDs because of my position, allow me to state categorically that, like it or not, these things virtually sell themselves. Like many readers of *Stereophile*, nothing quite

## The Ten Best Buys in Audio

### Art Dudley & Kent Bransford on the Linn Sondek LP12

". . . What, are we nuts? A \$1200 turntable as one of the ten great values? Or is this just one more manifestation of our strident pro-Linn bias? Neither. Just listen to me for a second: The lesson to be kept in mind here is that the turntable is the most important, influential component in a record-playing hi-fi system, period. (The fact that this is the product that taught us that lesson, though noteworthy, isn't necessarily relevant here.) And, in terms of reaching a higher level of musical performance - getting the notes right, getting the rhythms right, letting the emotion of the performance come through - the LP12 truly can transform the sound of any hi-fi . . .

Combine this level of capability with the fact that Linn's Stateside distributor has aggressively worked to keep US prices as low as possible, on a par with its cost in the UK, and with the upgradeability of this ever evolving product, and you will perhaps come to the conclusion that we have: To someone who really cares about records, this effective and extremely durable device truly is a bargain . . ."

### Reprinted from *Hi-Fi Heretic*, Issue #10

Although CD, cassette and tuner are convenient sources, when **performance** is the criterion, a good turntable system outclasses them all. In literally thousands of demonstrations it has been shown that a Linn turntable provides **clearly superior performance** over all other sources of music in the home; and that an investment in upgrading your turntable system will make a bigger improvement in your hi-fi than any amount spent on magic cable, bigger amplifiers, or any other "down-stream" components.

The Linn Sondek LP12 was the only turntable selected by the *Hi-Fi Heretic* as one of *The Ten Best Buys in Audio*. While four other turntables (including the Linn Axis) were listed as runners up, no CD, tuner, or home cassette deck even made the list.

Visit a Linn dealer and hear a Linn Turntable for yourself. Because there are times when you want convenience, and then there are times *for the sheer love of music*.

For additional information on Linn Hi-Fi and the name of the dealer nearest you contact:

Audiophile Systems, Ltd., 8709 Castle Park Dr., Indianapolis, IN 46256 (317) 849-7103  
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does it for me like an all-analog vinyl record for that elusive flesh-and-blood liveliness. But neither my mind nor my ears are closed. A *good* CD is a delight to hear. A good CD does not sound dull to me. A dull work, or a dull performance of a great work, sounds dull. A bad recording of a great work in a powerful performance is a negative stimulation which will send me to the Off switch on my CD player, perhaps to a record or a tape, or perhaps to a better CD.

My preferences in concert seating are reflected in my equipment and recording preferences. Startling degrees of depth and front-to-back, side-to-side pinpointing within an ensemble are less important than general imaging, instrumental and vocal timbres, and a sense of ambience I can relate to. I admire productions in which performers are recorded as they perform. I get very annoyed with productions in which placement is drastically altered for recording, simply for stereo effect: multi-mono is anathema.

To those who live in houses, with audio systems in dedicated rooms, urban apartment dwelling may seem antithetical to advanced audio. Granted, there are problems; but I am fortunate to live on a high floor of an old West Side building housing many musicians who spend a great deal of time practicing, individually as well as with ensembles, and who listen to their own stereos at all hours.

The neighborhood is ethnically mixed and noisy. One is subject to the interruptions of fire engines, police and ambulance sirens, and car alarms around the clock, so what's an occasional loud stereo? True, the lack of complaints I receive about my listening are somewhat offset by the outside interference, but if a work is interrupted by outside noise, I merely start over.

As a medium-budget person, I do not trade entire systems twice or thrice a year. I have gradually assembled my second complete system since my arrival in New York: Speakers: M&K Satellites on 18" cinder blocks; Subwoofer: VMPS Original Subwoofer on Tiptoes; Subwoofer amp: summed Hafler DH200; Cross-over: Dahlquist DQ LPI; Main amp: B&K ST-140; Preamp: Apt Holman; Turntable: Thorens 126 III (Osawa Platter Pad and SOTA Clamp); Cartridges: Shure V15V; Grado XTE+1 (78s); CD: Yamaha CD2; Open-reel: Technics 1500; Cassette: Denon DR M10HX; Sony WM D6C (Walkman Pro); Stereo Mike: Sony 929LT; Headphones: Sony MDR VI; FM: Dynaco FM5;

Antenna: Terk Indoor; Video: RCA VKT 650; Viewing: ten-year-old Sharp 13" color TV; Improved viewing: Commodore 1702 13" color video monitor; Surround: a pair of cheap Radio Shack speakers on the floor-rear corners of the listening area, wired to the main speakers according to the Hafler configuration.

The speakers, approximately 6' apart, play into the length of the room, slightly toed in. The tweeter panels are tweaked with a foam surround, and there are foam panels on the walls around the speaker area. The window behind the speakers is curtained by heavy drapes I had made for the purpose. They can be partially open, or drawn fully over the window. During mild weather, the system sounds quite good with the drapes apart and the window open. The floor is covered by a "Persian" rug. One of my tubas, a rug thrown over it, stands on its bell between the two speakers. The woofer gains from its corner location and plays not only into the length of the living room, but has the additional length of the space beyond, the dining area, and kitchen.

The B&K ST-140 has received its due recognition from *Stereophile*. The Apt Holman Preamp has not. It contains switching and channeling capabilities of importance to collectors of varied and unauthorized media. Its sound may not inspire high-blown high-end accolades, but it does its thing with total honesty. I'd be curious to see how it stands the scrutiny of a *Stereophile* review.

The Thorens 125 III is ideal for the collector who has both LPs and 78s, especially those discs in need of speed adjustment. Granted, it's not a SOTA, Linn, or VPI, but Thorens is recognized for its own excellence. The Premier MMT Arm has been recognized as unbeatable in its price range, and no "Hobson's Choice." I'm so impressed by the Grado 78 cartridge that I'm inclined to try one of his LP models. The Shure tracks like crazy, but is a trifle bright. I use the entire LAST line of record-care products, including LAST Stylus Cleaner and Stylast Preservative. They work.

I'm satisfied with the Yamaha CD2, but am intrigued by some recent entries, such as the new Adcom 575. I play CDs with another one on top. It does sound better, though the Sims Damper Rings sound better still.

The Technics 1500 takes 10½" reels, records half-track, can play back ½- and ¼-track tapes, and corrects pitch on off-speed tapes. An or-

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chestra with which I perform is professionally recorded, and I receive my own copies of the masters, without noise reduction. The Sony Walkman Pro is ideal for personal recording, taking to rehearsals, or taping concerts by performers whose names I dare not utter. The Denon M10Hx is the second-least-expensive cassette deck they make, and is all I need for listening, copying, gift-making, bribe-making, etc., in this almost but not quite audiophile format. Try the smooth, detailed, and comfortable \$30 Sony MDR V1 headphone before spending more for a dynamic set.

The RCA VKT 650, a VHS Hi-Fi VCR, has all of 1984's model trimmings, just short of SAP capability. So far, I'm living without stereo broadcast TV, although I often view and tape simulcasts. Aside from the other obvious uses of timeshift viewing, collecting programs, taping rentals, etc., it is extremely handy for taping syndicated concert broadcasts.

Raise your eyebrows all you wish at my primitive surround system. I insist that it corrupts nothing and enhances much.

Source, anyone? Where do I begin? I won't list 78s, that's too esoteric, but a good 78 is startlingly lifelike within its limits. The 78 was direct-to-disc.

LPs: Too many RCA Shaded Dogs by Munch and Reiner to mention. Two examples—the Munch/Boston Ibert *Ports of Call* and Debussy *La Mer*, and the Reiner/Chicago Respighi *Pines and Fountains of Rome*. Virtually any Lyrta, such as the Boult/LPO Arnold English, Cornish and Scottish Dances. Any Chesky, my current favorite being the Reiner/Chicago Prokofiev *Lt. Kije*.

Analog source CDs: Any Chesky for sound. Musically, my favorites are the Barbirolli Sibelius 2, Reiner Brahms 4, and Liebowitz Beethoven symphonies 2 and 5, the first installment of what may be the most important Beethoven cycle since the 1962 Karajan. The Melchior Anthology on Danacord exemplifies CD's capabilities for presenting the full range of vintage archive recordings, in this case from early 78s through early stereo broadcast taping. And virtually any Harmonia Mundi, who continue to master everything in analog.

Digital source CDs: DG recordings of Mahler symphonies 2 and 5 by Bernstein. The improvement in DG's sound is nothing short of incredible. Denon's recordings of Weber's *Der Freischütz*, and Strauss's *Der Rosenkavalier*, taped

live at the Semper Oper Dresden. They put you there in the house, practically first-row center. You can hear the prompter and the stage noise, all quite engrossing and "analog" in quality.

To list each of my favorite recordings would require a separate feature.

Though there has been little video in *Stereophile*, I'll cite just two video cassettes which I believe sound about as good as this format can, and for which stereo is as appropriate as it is well executed: Frederick Ashton's ballet *La Fille Mal Gardée*, taped live at Covent Garden, London, by the Royal Ballet, conducted by John Lanchberry; and Martin Scorsese's *Raging Bull*, in which the surround effect is used to give thrillingly powerful atmosphere to the fight scenes. Hardly *Star Wars* or *Raiders*, but it's great to have the high-tech stuff applied to adult dramatic fare.

Wish list: videodisc player, second VCR, surround processor, alternative LP cartridges, 20" video monitor. I don't contemplate changing the main speakers until I am satisfied with additional acoustical treatment in the room.

My system is not necessarily the state of the art, but I enjoy its strengths and can bear its weaknesses. It's the music that counts. **S**



**"The effect of cleaning a record with the Nitty Gritty is astonishing" John Atkinson**

I reached for my British RCA pressing of *Casino Royale*, well-chewed by countless cartridges and the ravages of the elements for 22 years. The background groove noise was not particularly high in level, but had a gritty quality. Just one clean on the Hybrid 2 reduced this to an occasional minor tick, taking the background noise below the level of the intrinsic master tape hiss."

Please read the full review in the March issue of *Stereophile* (1989). Five models to choose from, starting at \$270.

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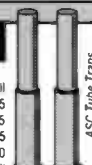
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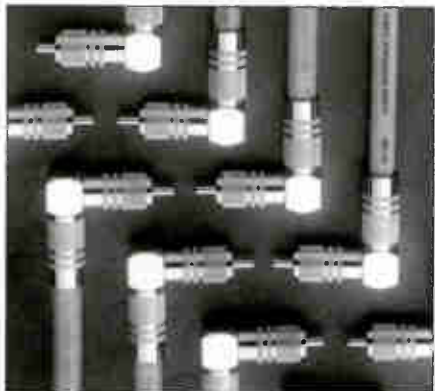
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## BEETHOVEN'S "PASTORAL" SYMPHONY

Mortimer H. Frank

**I**t is ironic that Beethoven's Sixth Symphony, the "Pastoral," perhaps the most genial of all his orchestral works, was not an instant hit. One contemporary critic damned the work so thoroughly, he provoked from the composer the angry response, "*Was ich scheisse, ist besser als was du schreibst*" ("What I shit is better than what you write"). Even more than a century later, the work remained something of a stepchild. A review of an all-Beethoven program led by Arturo Toscanini in 1934, for instance, claimed the Seventh Symphony to be "a far greater work, free of the banalities" of the "Pastoral."

Owing in good measure to the impact of the phonograph, our musical taste and literacy are far more developed today. Indeed, when Leonard Bernstein spoke not long ago on PBS of the finale to the "Pastoral," he cited its "Brucknerian proportions." And we now recognize that, even with its imitation of bird calls in the second movement, the score is not programmatic but rather, as Beethoven took pains to point out, "an expression of feeling."

In the spirit of Bernstein's analogy, one might also say that the "Pastoral," with its many unusual features, is as bold and dramatic a symphony as the "Eroica" or the Ninth. It is the only Beethoven symphony in five movements. Its scoring is unusual: especially light yet markedly colorful in the two opening movements and contrastingly rich, with piccolo and trombones in the closing ones. Its third movement, a scherzo in all but name, mixes dupe and triple meter, and its finale is the only closing symphonic movement that Beethoven shaped as a rondo.

With its unique features, the "Pastoral" poses interpretative problems. Special care is required



with balances to insure that the first movement, despite its light scoring, is appropriately colored with bucolic winds and horns, for which Beethoven wrote so idiomatically. The slow movement must flow smoothly, or its "brook" will stagnate. The third movement, with its slightly irregular binary form, demands that the indicated *da capo* not be ignored, and the finale must be rhythmically steady so as to secure continuity between the recurring (and occasionally varied) rondo theme and the many digressions from it. And most of all, a conductor must strike a balance between the work's clearly spelled-out association with nature and its grand design as a tautly structured Classical score free of excess and sentimentality.

From the earliest days of electrical recording, the "Pastoral" has been served in divergent ways, often superbly. The first conductor to record all the Beethoven symphonies, Felix Weingartner, produced the phonograph's first "Pastoral" in 1927, and it was a beauty; so much so, in fact, that it has come down to later generations in three LP editions: a 1951 transfer issued by Columbia (now CBS, ML 4506) and two from the late '70s produced in Japan—an Angel disc superbly transferred by Anthony

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Griffith (EAC 60082) and an inferior remastering from Artisco (YZ-3005). All three of these reissues are currently out of print, but often turn up in secondhand stores. A copy is worth having. By today's standards, of course, the sound—poorly balanced, lacking presence, and veiled by considerable surface noise—is antediluvian. But Weingartner's conception, with its bubbly bass line, joyous outer movements, and subtle voicing, goes right to the heart of the score, its only interpretative blemish being an omission of the essential third-movement repeat.

Three other extraordinary 78rpm editions, all having gained resurrection on LP, deserve mention: those of Franz Shalk, Bruno Walter, and Arturo Toscanini. The Shalk, recorded in 1930 with the Vienna Philharmonic, was reissued in Japan in another poor Artisco transfer now hard to find (YT-3006). The performance, like Weingartner's, is lively and buoyant and makes clear that our association of slow, heavy-handed tempos with German artists is mere musical stereotyping.

The 1936 Walter/VPO recording was reissued in a number of LP editions, the most readily available being the Vox Turnabout (THS-65042). Many considered this performance *the* "Pastoral" of the 78 era. But it strikes me—as does Walter's third (and last) recording of the work, in stereo, in 1959 (CBS CD MYK 36720)—as too thickly textured and, at times, almost sentimentally *gemütlich*. Certainly the best played and least sentimental of Walter's "Pastorals" is his 1946 Philadelphia Orchestra version (Columbia LP ML 4010 or Odyssey set 32 66 0001, both out of print).

Toscanini's 1937 recording with the BBC Symphony is a phonographic landmark: superbly engineered for its time; joyful, unmannered, richly detailed, and grandly architectural, it boasts all sorts of felicities, from the aptly staccato oboe and powerful *sforzando* chords of the first movement and the delicacy of the second to an explosive "Storm" and a finale that, for all of its suggestion of grandeur, remains a tender hymn of thanksgiving. And the performance, better disciplined than Toscanini's 1952 version with the NBC Symphony, can be heard in a splendid new transfer made by Keith Hardwick in a 3-LP Seraphim set (IC-6156) that includes a previously unreleased 1935 live Toscanini BBC Beethoven 7. This set, by the way, is almost certain to be made avail-

able soon on Compact Disc.

Somewhat eccentric, but nonetheless arresting, are two performances (almost identical interpretatively) led by Willem Mengelberg, both with the Amsterdam Concertgebouw Orchestra: a studio recording from 1939 (Teldec CD 243 728-2) and a live performance from 1940 (Philips CD 416 203-2). All sorts of quirks abound here: rhythmic distentions, tempo manipulations, jarring gear shifts, and revisions of Beethoven's orchestration. Nevertheless, Mengelberg's "feel" for the music's joyful spirit often shines through, and his unorthodox treatment of the finale, which makes it sound more like a peasant's drinking song than a hymn of thanksgiving, is, in its odd way, strikingly musical. Certainly as examples of a performance style that no longer exists, these discs (the Philips offering the better sound of the two) provide an illuminating walk into history.

Also interesting is Wilhelm Furtwängler's 1952 recording with the VPO, recently reissued in a fine CD transfer on Angel 47121. The conductor equates Beethoven's jubilation with repose, and some may find the first movement a bit too relaxed and the finale too free rhythmically. But as with Mengelberg, one hears an original and highly responsive musical personality in a reading that, if somewhat arbitrary, can never be faulted for the facelessness that stamps much of today's Beethoven playing. And the sound, considering its age, is quite good.

No survey of pre-stereo "Pastorals" would be complete without mention of the 1953 Erich Kleiber/Concertgebouw account recently reissued on CD by London (417 637-2), coupled with the conductor's justly admired Beethoven 5. Aside from a slightly fussy slow movement, Kleiber's view echoes the Classical rigor of Weingartner and Toscanini: lean, joyous, and superbly controlled. First-movement balances are faulty, however, with strings covering important woodwind material. All the same, this CD preserves some of the best engineering of the pre-stereo period.

With the emergence of stereo, there have been innumerable versions in modern sound, and many collectors, I suspect, would welcome a recommendation of the single, standout "best." To so label any recording of a score like the "Pastoral," however, is impossible. A great work of art, after all, is a living thing, and its



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# **AUDIO STUDIO**

realization defies such superlative categorization for the same reasons human beings do. The idea of a "best" friend, after all, usually passes with the waning of adolescence. Thus, as with historical performances, we find a number of first-class yet divergent modern "Pastorals" that serve as reminders of how a glorious work admits a variety of interpretive views.

Two of the most interesting of those views come from German conductors outside the glare of the international spotlight, Herbert Kegel and Günther Wand. Among all modern editions, Kegel's (with the Dresden Philharmonic, Capriccio CD 10004) is closest to the old Weingartner account—a fleet initial movement supported by lean, sharply etched bass; a flowing brook; and three concluding movements marked by infectious vitality and firm rhythmic control. And sonically, this disc is magnificent, with remarkably natural string tone, wide dynamic range, and (in the closing movements) biting brass.

It was only this winter that Wand made his American debut (at the age of 76 with the Chicago Symphony). His Beethoven cycle for Harmonia Mundi that EMI is releasing in this country is among the phonograph's finest, and the "Pastoral" from this cycle (47526), if suffering from a rather cool, understated first movement, is otherwise gorgeous, its shaping and control of the finale redolent of the splendors of Toscanini's BBC account. As with Kegel's Dresden orchestra, Wand's Northwest German Radio ensemble lacks some of the tonal allure and virtuosity of the foremost world-class groups, but an occasional roughness, especially in a movement like the peasants' gathering, suits the music perfectly.

Recently reissued on CD are two Leonard Bernstein versions, one from 1965 with the NYPO (CBS MK 42222), the other from 1978 with the VPO (DG 413 779-2). Despite Bernstein's conception having undergone virtually no change during the 13 years that separate these recordings, the Vienna version is far preferable, mainly because of its superior sound. The harsh, grating edge of the CBS edition, with its phony balances and unpleasant spotlighting, is unmusical and works against the gentleness of Bernstein's conception. DG, in contrast, provides a thoroughly natural ambience for its (in-concert) recording, featuring the distant perspective of an excellent first-row balcony seat. And it is this naturalness of

sound that complements Bernstein's tender, even loving way with the music. Although his tempos are never slow and his rhythms always bracing, the conductor suggests a repose (free of Furtwängler's mannerisms) that Beethoven himself must have felt when he escaped to his beloved Vienna woods. In every way, this is a remarkably fresh, yet stylish, unidiosyncratic reading, one of the finest available.

Herbert von Karajan has recorded the "Pastoral" four times, his three most recent readings—all with the Berlin Philharmonic—available on CD. In each, the basic conception is similar: cool, unsentimental, with lively tempos, little rhythmic inflection, and an overall refinement best exemplified in long legato lines that smooth away some of the music's intentionally craggy edges. The earliest of the three, dating from 1962 (DG 423 203-2), though superbly played, suffers from an omission of the third-movement repeat and from (pre-Dolby) tape-hiss. The most recent version (1984, DG 413 932-2), if very well-recorded, lacks the precision and control of the earlier two. Thus, the prize goes to the 1977 account (DG 415 833-2). It has many compelling features: virtuosic execution, wonderfully natural timbres, and a wide dynamic range that yields big climaxes and a "Storm" that provokes terror. But Karajan's legato phrasing may irritate, and the softest passages sound synthetic, receding into the distance in the way a visual image does when a zoom lens moves back from its subject.

Among other versions from superstars, two—Otto Klemperer's and Klaus Tennstedt's—which one might expect to be distinguished fall short of the mark. Klemperer's Philharmonia Orchestra account can be heard to fine advantage in its recent digital updating (Angel CD 47184). The playing is disciplined and rhythmically rock-steady, but the performance exhibits all the joy of a child anticipating a trip to the dentist. When Klemperer was making this recording, producer Walter Legge interrupted the first take of the third movement with the question, "Isn't the tempo too slow?" "You will get used to it," Klemperer retorted. Most listeners, I suspect, would find such an accommodation impossible.

Utterly different is Toscanini's lively, lean rendition with the London Philharmonic (Angel CD 47459). The music dances, the winds cut through to provide aptly rustic coloring, and the whole performance has a woody charm.



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But things sometimes sound a bit too breezy and casual, with phrases smoothed over and needed inflection and accent wanting. For those who delight in understatement, however, this release may prove appealing.

A performance worth seeking, although it is only available on cassette (Philips 412 288-4), features a 1960 Amsterdam Concertgebouw Orchestra under Wolfgang Sawallisch. Here the winds and horns in the first movement have a color and clarity found in all too few versions. Without any interpretative tricks, Sawallisch lets the music unfold with unaffected but touching simplicity. And the sound from the cassette, hiss notwithstanding, is state-of-the-art for early stereo; more natural, in fact, than that of more recent recordings.

Two budget editions from central Europe featuring conductors not nearly so well known in this country as they deserve to be—János Ferencsik and Paul Kletzki—are worth investigating. The Ferencsik (with the Hungarian State Orchestra) comprises a straightforward, nicely balanced performance that makes no grand gestures. Rather, it simply clarifies key elements of the score: countermelodies, texture, and color. Be sure, however, to avoid the very inexpensive Laserlight CD edition; the transfer of this 15-year-old recording is painfully thin and harsh. Far better sonically is the recent Hungaroton White Label CD (HRC-113), which, if a bit more costly, is still in the budget ballpark.

The 1966 Kletzki version (coupled with superb readings of the *Coriolan* and *Egmont* Overtures on a Supraphon CD, 2SUP 0018) has a rather light weight, small-scaled finale, but it is otherwise lovely. Indeed, its first movement is as good as any, with seemingly perfect balances, sharply etched motifs, and bracing rhythm that enliven a finely judged, unhurried tempo. Clearly a master musician is in charge, and the Czech Philharmonic proves highly responsive to him.

It is interesting in the light of what straightforward, unaffected conductors like Kletzki, Ferencsik, and Sawallisch achieve to hear how a similar directness in the performances of Sir Neville Marriner (Philips CD 416 385-2), Bernard Haitink, and Kurt Masur (the latter two only in CD sets of the nine symphonies, both released by Philips) yields bland, rather characterless readings, a difference that repeated listening exposes to be rooted in less careful

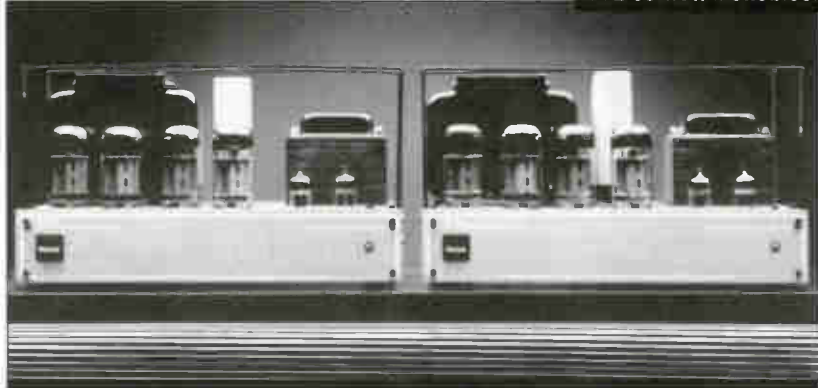
attention to key details—an inner voice here, a motivic outline there, etc. In the concert hall, each would be more than acceptable, but none invites multiple hearings.

This discussion would not be complete without considering “authentic” performances, which because of their use of small ensembles of period instruments, defy comparison to conventional versions. I have not heard the Roy Goodman–Hanover Band “Pastoral,” but know the Roger Norrington (EMI CD 49746) and Christopher Hogwood (London CD 421 416-2) performances quite well. Although the size of the orchestra differs slightly from one account to the other, all three draw upon the same London pool of excellent period instrumentalists.

As is probably obvious, none of these performances can be “authentic” in the sense of comprising the “correct” way of performing the work. Any great music defies such a performance for the same reason that *Hamlet* and *Crime and Punishment* defy single “correct” interpretations. What these “authentic” readings do offer is a suggestion, and probably a fairly accurate one, of how the sonority of Beethoven’s orchestra differed from that of ours: leaner, more nasal strings free of vibrato, piquant winds, and golden, sharp-edged brass, all of which produce a more brightly colored, astringent-sounding ensemble.

In this regard the Norrington and Hogwood versions are similar, and both feature fairly fast tempos as well. Similarities end there. Hogwood is utterly superficial, moving across the music’s surface and suggesting no more of its depth than a skater perceives beneath the ice he glides over. Rhythms are rigid, inflection almost tonally absent, with a resulting lack of contrast and drama that suggest a lobotomized Beethoven. Norrington, in contrast, is vibrant, flexible, and infinitely more concerned with nuance and shape. As a result, he suggests far more of the music’s power and emotional range.

Many conventional versions are ignored here, mainly because they have not struck me as being in any way noteworthy. I hope that I have slighted no one’s favorite. Some big names, notably George Szell and Pierre Monteux, have been passed over, primarily because their “Pastorals” fail to represent them at their best. Whatever my omissions, I can safely say that the recordings discussed here cover wide interpretative parameters and should offer something for virtually every taste. **S**



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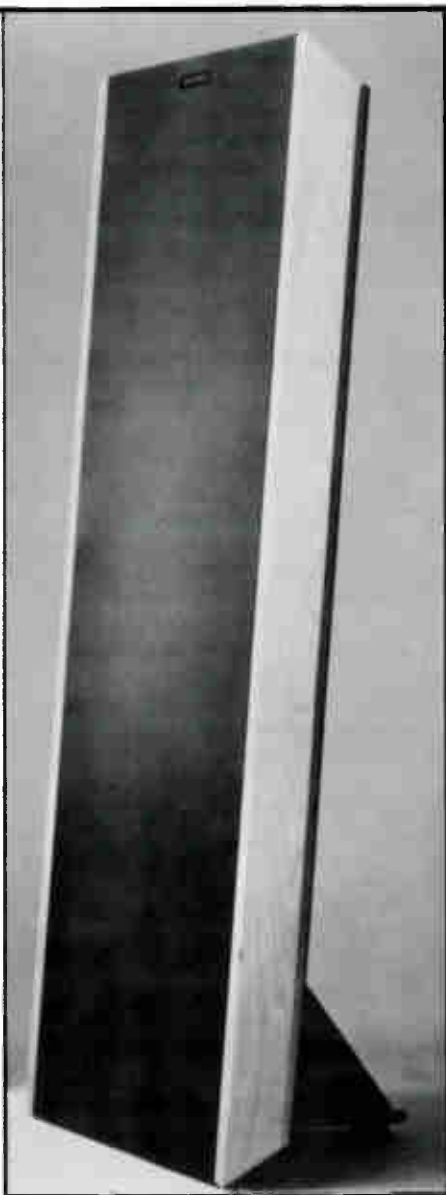
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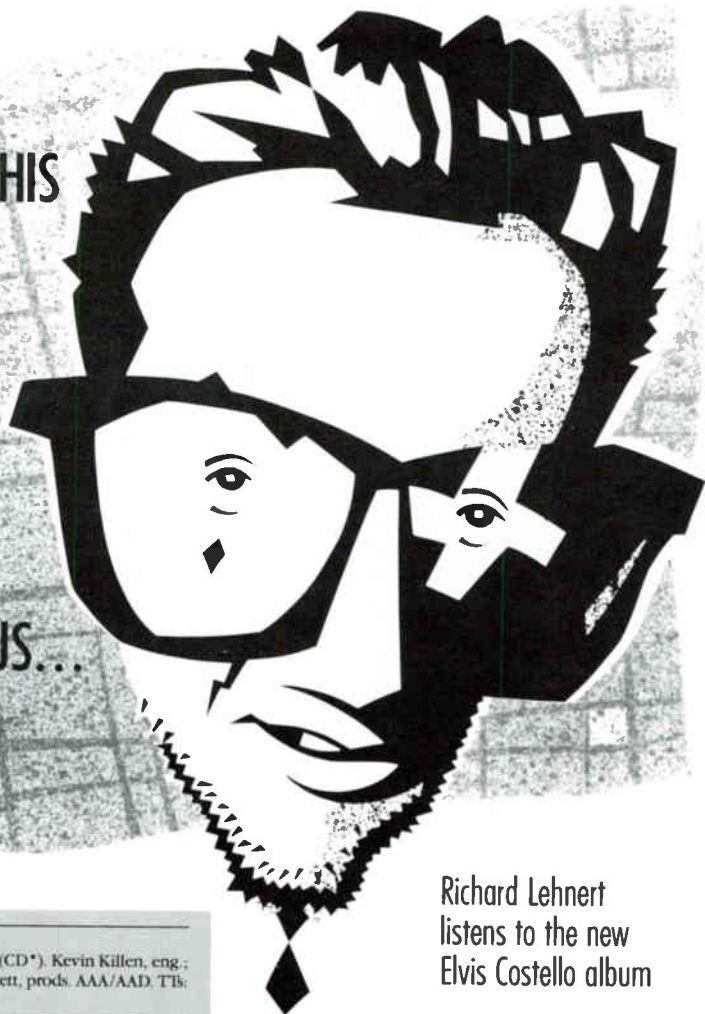


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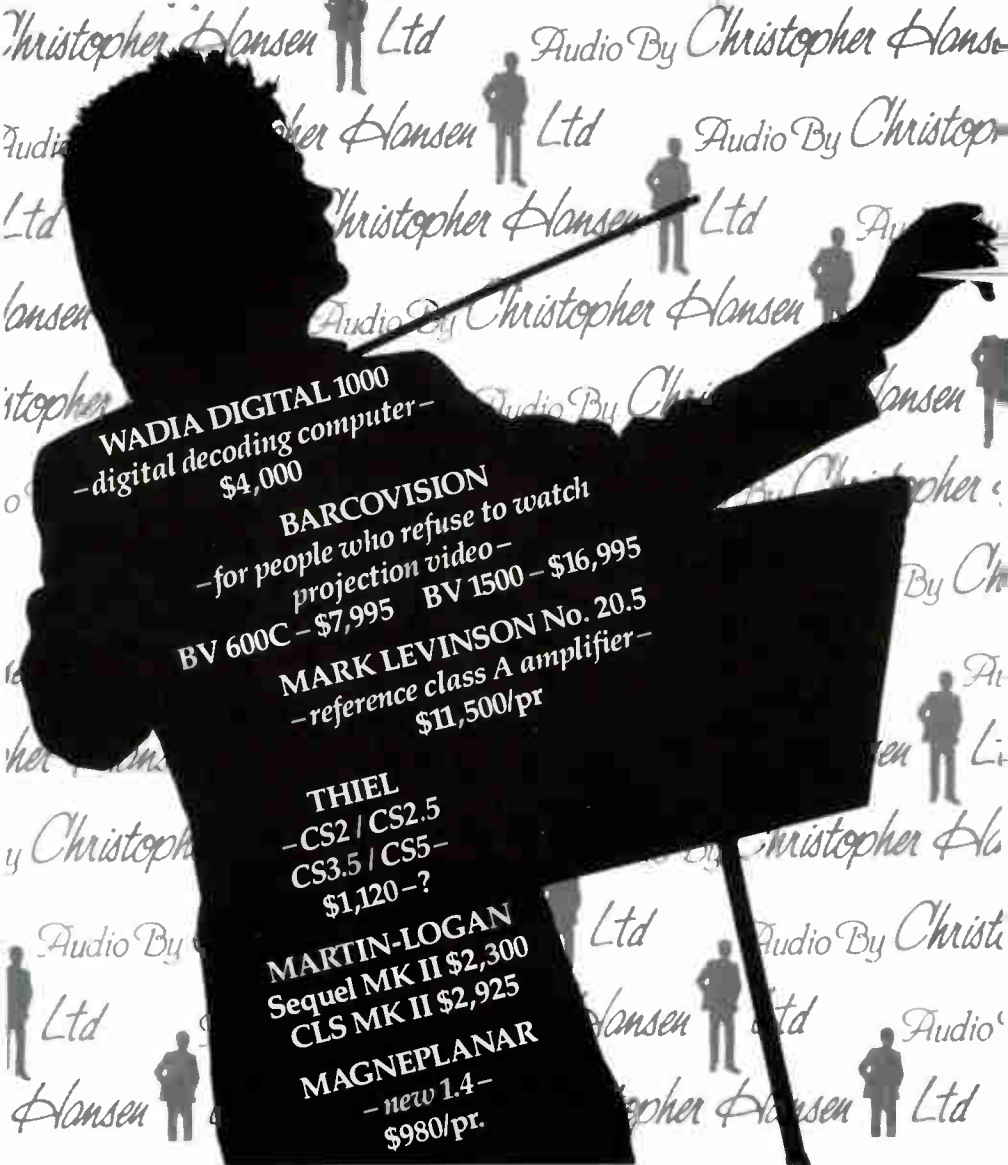
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Warner Bros. 25848-1 (LP), -2 (CD\*). Kevin Killen, eng.; Killen, Costello, T Bone Burnett, prods. AAA/AAD. TTs: 61:17, 64:34\*

The ideal rock singer/songwriter? Someone who addresses adult issues with all the passion of adolescence (than which, believe me, there is none more monomaniacal—there's no righteous indignation like a teenager's). Someone who can sing about him- or herself and strike the universal; someone who can tell a story of what the swells call "the human condition," or of some social injustice, in terms of how it affects a single life in all that life's unique details. In this case, some musical near-illiterate like "The Beloved Entertainer," as it says on the little brass nameplate under the harlequin-painted face exploding from the golden Warner Brothers shield on the cover of *Spike*—The Little Hands of Concrete himself.

But who *is* this Declan Elvis Patrick Spike Aloysius Costello MacManus, anyhow? Take any Elvis Costello album (except *Almost Blue* and *Imperial Bedroom*, his worst and best), listen closely for half a dozen songs, and you'll hear a history of US/UK pop music compressed to the density of a white dwarf's core: the Beatles, Elvis I, Patsy Cline, Van Morrison, The Band, Gram Parsons, Dylan, Duane Eddy, Pet Clark, the Beach Boys, the Beatles, James Brown, the Stones, Ray Charles, Paul Simon, George Jones, the Beatles... I could go on; it's all there. But EC's music has never been a mere collection of borrowed inflections, never smacked of pastiche or collage; these traces and influences are not so much assembled by



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yet another rock dilettante/poseur as they are radiated from the center of a white-hot sensibility of ferocious, omnivorous musical intelligence. And—as I proceed to destroy what little credibility is left me in the following scramble for superlatives, written in a style more or less inspired by this album's sheer density of information musical and lyrical!—*Spike* is one of the best efforts yet from that hearty mind.

EC played out his 1986 identity crisis in the media, conducting "The Elvis Costello Show" as Declan Patrick Aloysius MacManus (all but the penult are his actual given names) and leaving his band, the Attractions, to record the brilliant but somewhat strained and abashed *The King of America* with Jerry Scheff and James Burton of that other Elvis's band. Scant months later, calling himself, of all things, Elvis Costello, he released the clanging, pounding *Blood & Chocolate* (the best Beatles album since 1969) with the miffed but mollified Attractions. (CBS, his label at the time, was less than sympathetic about all this moniker mangling.) Then, between labels, came a long silence barely broken by the UK-only release, on Demon Records, of *Out of Our Idiot* by "Various Artists." (This, like *Taking Liberties* six or seven years before, is a catch-up, hour-long grab-bag of 17 out-takes, covers, A- and B-sides, and alternate takes, none of them released on other LPs; recommended.)

*Spike*, his first album for Warner Bros. and the world's first plaid CD, shows a much stronger, more coherent, less scattered EC concerting all of his considerable talents to produce a *tour de force* of songs that can be not only achingly intimate, but also pointedly germane in their strong social, political, and moral stances. As sharply observant of its time as *Blonde On Blonde* was of its, but infinitely more musical, *Spike*'s look back at the Empty Eighties packs the outrage of what used to be called "Punk" with the acidic humor of Tom Wolfe and a punch and heartbreak all Costello's own—a neat trick, and no trick at all. But enough of these sweeping generalizations.

The CD holds 15 songs (the LP lacks "Coal-Train Robberies"), immediately setting its uncompromised tone with "... This Town . . ." in which EC takes on the present virtue of what was once vice—the lean, clean & mean school

of barracuda business reveling in its own ruthlessness: "You're nobody 'til everybody in this town thinks you're a bastard." Check. How Costello turns garglers like "Mr. Getgood moved up to Self-Made Man Row" into musical scansion is beyond me. (By the way, that's Paul McCartney on bass, Roger McGuinn on 12-string, and Jim Keltner drumming.) Then there's capital punishment, roasted to a golden brown in "Let Him Dangle," which recounts a story, recycled from one of Britain's last executions, in 1951, of an innocent hung for another man's crime. The title is the chorus, and EC rips into it savagely. Marc Ribot's guitar solo is worthy of George Harrison's Beatle-ish best. "Deep Dark Truthful Mirror," one of four cuts featuring the Dirty Dozen Brass Band (and, on this one, Allen Toussaint), is a classic EC lament about female duplicity with one of those mounting, climactic choruses. This is the kind of song that has earned Ol' Dec his (undeserved, I think) misogynist rep.

McCartney's bass shows up again on "Veronica," half of which he wrote. It's the lightest song here, a humorous but distant look at old age, sort of a cross between "Eleanor Rigby" and "When I'm 64," and even includes a psychedelic harpsichord. And as long as we're recycling the Beatles, you could patch a little of Lennon's "I'm Only Sleeping" onto the Fab Four's patented bar-by-bar shifts between major and minor and come up with "God's Comic," a black-comic priest's-eye-view of himself dead and traveling up to that great vicarage in the sky, wondering if God can tear himself away from his pulp novel and Lloyd-Webber's *Requiem* long enough to remember any of the priest's jokes ("I prefer the one about my son."). Really.

To EC, the war between the sexes is always Armageddon, and, in "Chewing Gum," he sings, to a clanking, lopsided guitar chart worthy of Capt. Beefheart, about how the game is rigged from the git. One thing about a tragic sensibility—it makes for great art. "Tramp the Dirt Down" is about Margaret Thatcher ("When England was the whore of the world, Margaret was her madam"), her war-mongering and supply-sidism. In traditional ballad style, complete with Uilleann pipes, the song is wrenchingly straightforward, impassioned, tortured, and a wee bit incoherent. But this is the crystalline incoherence of Dylan at his mid-'60s best, hothouse images and phrases coming so

1 Not to mention Samuel R. Delaney's *The Bridge of Lost Desire*.

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Shown: Infinity's IRS Beta speaker system.

thick and fast, comprehensible or no, that each could be the first line of a new song. And, yes, there's more than a taste of "Masters of War" here, as Costello looks forward to the day when he can tramp down the dirt over Thatcher's grave. Describing Thatcher's publicity-conscious kiss of a child in pain: "Can you imagine all that greed and avarice coming down on that child's lips." Don't have to now, EC.

From passion to dry wit: "Satellite," EC's chilling lullaby waltz to that great unconscious global collusion, the unnatural act of telly-watching. TV as pornography—"Now they both know what it's like inside a pornographer's trousers." "Baby Plays Around" is EC at his most vulnerable, just him and an acoustic guitar (OK, there's some atmospheric organ thrown in), at his self-pitying best: poor me, while you go adulterating. In fact, "A tearful lament of somebody done wrong," as he explains in the next tune, "Miss MacBeth," whose foreboding verses about some childhood voodoo queen I do not understand. (Let's face it—some of EC's patent models in his ongoing, and mostly successful, reinvention of the language of love simply don't *work*.)

But there's no trouble sussing "Any King's Shilling," which, in the tradition of "Arthur McBride" and a hundred other Irish ballads, begs yet another poor sod not to take the King's Shilling (payment for enlistment) and put his "silly head in that British soldier's hat." With celtic harp, bodhran, more Uilleann pipes, and references to the "potato parade," it's clear where MacManus's sympathies lie. "Last Boat Leaving," the song of every exile to his child on the eve of furtive departure or deportation, delivers this bitter epitaph from the middle of its bridge: "You'll read my story in history books only they won't mention my name." Such mature historical sense, coupled with "King's Shilling," adds two more installments to Costello's growing cycle of war songs, which also includes "Ship Building," "Peace In Our Time," and "Sleep of the Just." They all share an elegiac sadness, the resistant, autumnal resignation of a Europe still battered from too many wars. This kind of expanded, historical vision makes most other singer-songwriters—especially American ones—sound one-dimensionally self-obsessed.

And all in that smoky, croony, Kahlua-on-ice voice that can sing its way into and out of more tight corners, and tear the guts out of a torch

song, better than anyone else in rock today. EC is a singer's singer. Don't believe it? Listen to "Beyond Belief" on *Imperial Bedroom* (hell, memorize it), "Sleep of the Just" on *King of America*, "I Want You" on *Blood & Chocolate*, or "Baby Plays Around" here.

The sound? JA thinks it's harsh, but then he hasn't heard *Blood & Chocolate*, which is all treble hash. I think it's some of the best sound Costello's ever had, though that's not saying much—it's clear Warners went out of its way to goose up the production values. It's multi-mono all the way, of course, with too many synthesized drums, but hats off to the Warners disc-mastering team for cramming over an hour of high-energy rock of considerable dynamic range on one li'l LP with amazingly little distortion or compression. The LP is superior in every way, except for the lack of "Coal-Train Robberies."

Having gone on *far* too long, I'll just say that each song on *Spike* could be the best song on any other album released last year, or to be released *this* year. It's that good. Gary Krakow thinks it's the album of the year. That makes at least two of us. **S**

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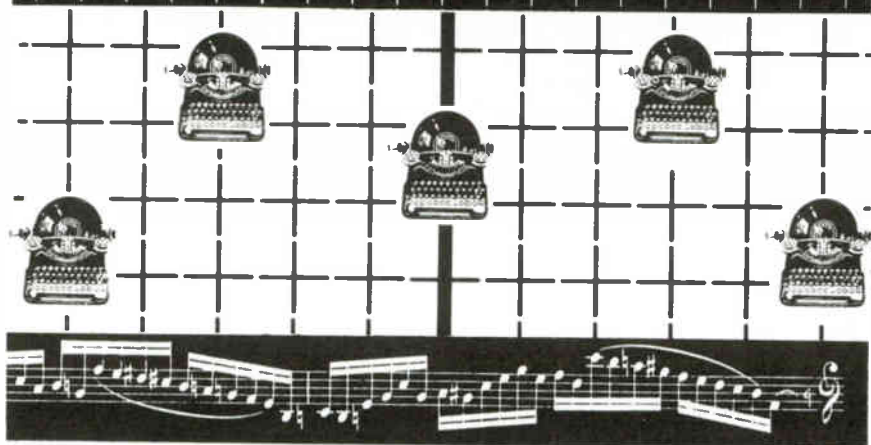
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# RECORD REVIEWS



## Classical

### BEETHOVEN: *Symphony 10 in E-flat*

The Story of Beethoven's Tenth Symphony (1st movement only, realized and completed by Barry Cooper)

Wyn Morris, London Symphony Orchestra; Barry Cooper, narrator & piano

MCA Classics MCAD-6269 (CD), MCA-6269 (LP). Trygg Tryggvason, eng.; John Boyden, prod. DDD. TT: 48:48

### THE ULTIMATE MUSIC BOX

C.P.E. Bach: Pieces for Mechanical Instruments, Wq.193: No.7 for Clockwork Harp; Nos.19/20 for Clockwork Flute and Harp; No.26 for Mechanical Clarinet; No.29 for Cylinder Organ. Beethoven: Wellington's Victory at Vittoria for Panharmonicon, Op.91; 5 Pieces for Clockwork instruments, WoO 33: Nos.1-3. Händel: 11 Tunes for Clay's Musical Clock, Set 1: Nos.1, 2, 5, & 8. Cherubini: Sonata for Cylinder Organ (1805). Haydn: Pieces for Musical Clock (1792), Hob.XIX, Nos. 18, 19, 22, & 24

Christopher Light, David Kraehenbuehl, performer-programmers (Macintosh SE computer; Sequential Prophet 2002 sampler; Yamaha TX81Z tone generator) Musical Heritage Society MHS 512264K (CD). Hudson Fair, eng.; DDD. TT: 35:09

How many symphonies did Beethoven write, anyway? And what does that have to do, if anything, with a fairly short-measure CD entitled *The Ultimate Music Box*?

The latter first: one of Beethoven's more commercial ventures was to write a just-over-six-minute-long *Wellingtons Sieg, oder die*

*Schlacht bei Vittoria* (Wellington's Victory, or the Battle of Vittoria), an 1813 creation intended for a mechanical instrument that had been invented by Johann Nepomuk Mälzel and which produced its sounds by means of a pinned cylinder. Basically, this Panharmonicon, as it was called, could imitate an orchestra through its interior reeds, wind, and percussion, and Beethoven, in exchange for one of the inventor's ear trumpets, evinced enough interest to provide a piece in praise of the British victory for the machine to play. Three years later, after some unpleasant battles with Mälzel over who had written and who really owned the piece, Beethoven added a programmatic first movement—the real battle part of the Symphony—this time scoring the entire, much longer work for live orchestra. That later two-movement version, of course, is not one of the numbered symphonies; in that non-mechanical version, it has been recorded several times, usually quite spectacularly.

What the Musical Heritage Society CD purports to offer, however, is a collection of music written for mechanical musical instruments of all kinds by a variety of composers, and it includes that 6:14 *Wellington's Victory* on the Panharmonicon, all the sounds having been produced by computerized synthesizer. Listening to the Beethoven, one can easily understand how amazed and impressed an early 19th-century public might have been upon originally encountering this strange machine. But if the subject and music of *Wellington's Vic-*

1 For collectors of recording trivia, Trygg Tryggvason was the recording engineer for the series of deluxe "audiophile" recordings that were issued by Gale in 1977.

—JA

story, as derived through complex timbral samplings and here electronically reproduced, is almost pure novelty, there are other examples (including a really gorgeous *Adagio assai*, WoO 33, No.1, written by Beethoven for a clockwork mechanism in about 1799) that can easily cause the modern listener to forget that this is a synthesized product and to concentrate wholly on the music. That is perhaps the biggest compliment I can give to the programmers of this disc.

As the excellent and thorough annotations explain, the many timbres called for (see the list of contents above) were programmed to simulate baroque and classical mechanical instruments that no longer exist. In one case, before World War II, however, there remained a genuine Haydn clock of 1792 whose charming, pipe-like tunes were actually once recorded on an ancient Decca 78rpm disc; comparing those sounds with the different, albeit similar Haydn pieces contained here reveals that the timbre is close if not quite exact. My only criticism of the often delightful, though dry sounds to be heard here (*ie*, the ambience is that of a smallish room or studio) has to do with the slightly unnatural decay at the ends of pieces, for example the lovely Cherubini and the conclusion of the C.P.E. Bach clockwork-harp *Presto*. Overall, a most intriguing collection, as well as a real sleeper for the person who seeks the unusual.

A more substantial symphony is promised by the MCA CD, in which we are provocatively told that Wyn Morris conducts the world premiere of Beethoven's Tenth Symphony. But, you say, Beethoven only completed nine (let's not for the moment count *Wellington's Victory*, shall we?). Right you are, but four groups of sketches made between 1822 and 1825 for a tenth do exist, including trials, reworkings, and chips off the workbench, plus additional, if not as voluminous, ideas for other movements. The British musicologist and Beethoven specialist Barry Cooper has reconstructed that opening movement, describing it without too much understatement in his nearly half-hour spoken lecture as "a rough impression," as well as, perhaps in a more self-complimentary vein, a work "close to the sort of movement Beethoven had in mind." Perhaps the most musically impressive part is the beginning *Andante* in E-flat, which reminded me of an opening to one of the late quartets combined with the kind of lyricism found in *Fidelio*; that introduction, interestingly, also was intended by the composer to serve as the movement's close, unique in the symphonies but not in Beethoven's late forms. The central C-Minor *Allegro* section, however, sounds both

unformed, rhythmically vapid, and not unlike a youthful, not yet matured composer of a later period who had come under the influence of the Beethoven style, say a young Gounod or Wagner, possibly even Schumann. One of the problems, of course, is that none of the extant sketches provides anything more continuous than 30 bars. Transitions and developments in the *Allegro* have had to be composed, with the result that listening to the central section of this 19:40 movement is a little like hearing some familiar bits of language, in which the strung-together phrases really do not make much sense. It is an interesting concept, reconstructed with obvious knowledge and skill but also a fair degree of conservatism, and there is much to fascinate. But it's also very difficult to consider this as anything but the most unfinished, conjectural Beethoven. The lecture's effectiveness might have been improved by the addition of tracking points (the movement itself also lacks any), as well as by having had at least some examples provided by the orchestra rather than by the piano. The orchestral reproduction lacks detail, especially in the swollen-sounding bottom end; greater articulation in the playing would also definitely have helped to prevent the Schumannesque sounds that characterize the not altogether stylish playing.

— Igor Kipnis

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#### GERSHWIN: RHAPSODY IN RUSSIA

"I Got Rhythm" Variations for Piano and Orchestra; Rhapsody in Blue; Promenade; 3 Preludes; 2 Waltzes in C; Rialto Ripples (Rag); Impromptu in Two Keys; Lullaby; Summertime (after-concert jam session)  
Lincoln Mayorga, piano (in all but Promenade & Lullaby); Dmitri Kitayenko, Moscow Philharmonic Orchestra (Variations, Rhapsody, Promenade, & Lullaby); Arkadi Shilkloper (French horn, Summertime); Stan Ricker (bass, Summertime)  
Sheffield Lab CD-28 (CD). Doug Sax, Steve Haselton, Keith Johnson, & Stan Ricker, engs.; Lisa Sonne, prod. ADD. TT: 56:08

The *Rhapsody*, the Variations, and a string orchestra version of the "Lullaby," originally written for quartet, are the most substantial of the 11 tracks on this most enjoyable and supremely well-recorded anthology. They, along with an *ad hoc* encore version of "Summertime," nicely jazzed up by the album's featured pianist together with a Russian-French horn player and an American bassist-cum-recording engineer, derive from two live concerts given in Moscow in, respectively, 1986 and 1988, the "I Got Rhythm" Variations and the *Rhapsody in Blue* belonging to the most recent of these recordings. That, of course, accounts for the album title. Lincoln Mayorga reveals unquestioned flair for the Gershwin style and demonstrates wonderful rhythmic esprit in all

*After silence, that  
which comes nearest  
to expressing the  
inexpressive is music.*

**—Aldous Huxley**



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that he does here (including the seven solos, which derive from a Pasadena concert of last year). The members of the Moscow Philharmonic, surprisingly idiomatic in this repertoire, seemed to be enjoying themselves hugely, and, a few moments of minor imprecision aside, these performances can be considered among the top-ranked of the many fine Gershwin recordings available on CD. What impressed me equally, however, was the almost palpable presence of the piano solo within the orchestra, as well as by itself. The recording, transferred to CD master from a two-track analog master tape, brilliantly upholds Sheffield's audiophile reputation. An added bonus are the printed personal reminiscences about Gershwin by composer David Raksin.—**Igor Kipnis**

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**GLUCK: *Iphigénie en Tauride***

Régine Crespin, Iphigénie; Guy Chauvet, Pylade; Robert Massard, Oreste; Victor De Narke, Thoas; Marta Benegas, Diane; Chorus and Orchestra of the Teatro Colón, Buenos Aires; Georges Sebastian  
Le Chant Du Monde LDC 278 769 (mono CD only). AAD.  
TT: 119:00

*Iphigénie en Tauride* is, arguably, Gluck's greatest opera. His disagreements with the florid style of the Italian composers of his time led to a rigidity which many found (and find) confining. But in this work, his penultimate French opera, the classical and passionate seem perfectly wed—this work packs an emotional wallop, is beautiful to listen to, and rarely fails to convince. It seems, however, that some of the public, after its Paris premiere in 1779, still wanted something more Italianate, more flowery. The composer Nicola Piccinni, a rival of Gluck's, was convinced to set the same story to music a year later, but when presented it was jeered off the stage. Part of this may have had to do with the fact that the soprano singing Iphigénie was drunk at the opening, but it may also be because the music simply wasn't up to snuff. We may never know—Piccinni's *Iphigénie* has faded into oblivion. Gluck's, however, while hardly of the popularity of, say, *Aida*, is still around.

There are two competing performances on CD. The first, a live 1957 La Scala performance, with Callas in the title role and Nino Sanzogni in the pit, is really not in the running. That performance is for Callas fans alone—the remainder of the cast is mediocre, the sound is awful, and the Italian translation, and more importantly, Italian style, is very much at odds with the truth in the opera. The other version, on Philips, is idiomatic if a bit lightweight, under John Eliot Gardiner, but the all-digital sound is a definite plus. The Chant du Monde release under consideration here, however, strikes me as the cor-

rect way to perform this opera, and the tubby, monaural sound is acceptable under the circumstances. I doubt whether a finer reading of this opera will ever become available.

In 1964, when this was taped (by a fan in the audience, I believe), Régine Crespin lacked nothing. She could rein in her vast voice when necessary, her exclamatory passages are riveting, the restrained, *pianissimo* singing a marvel. I cite as only one example her first-act "O toi qui prolongeas nos jours," which is so touchingly read here that the audience reacts vociferously—a rarity during a German opera in French performed in Buenos Aires. Hers is the Iphigénie to remember. Almost no less good, oddly enough, is the Pylade of Guy Chauvet, here sounding heroic without bullying, and with an elegance worthy of Gedda. This tenor, almost immediately after 1964, became a rather crude, monochromatic belter—it's a joy to have this memento.

Elsewhere in the cast we find the passionate, always interesting Robert Massard as Oreste, singing without much beauty but with great expressiveness, and Victor de Narke as the villainous Thoas—a role which really requires a darker sound, I feel. Georges Sebastian leads the orchestra and chorus of the Teatro Colón in a sensitive, fiery performance, entirely idiomatic and believable.

The libretto is French-only, but the two hours of music are contained on one double-play LP, and the sound is acceptable low-fi. This is *the* performance of this work that a collection needs, and I recommend it highly.

—**Robert Levine**

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**HÄNDEL: *Il Pastor Fido***

Paul Esswood, Mirtillo; Katalin Farkas, Amarilli; Marta Lukin, Dorinda; Gabor Kallay, Silvio; Maria Flohr, Eurilla; Jozsef Gregor, Tirenio; Savaria Vocal Ensemble, Capella Savaria; Nicholas McGegan  
Hungaroton HCD 12912/13 (2 CDs only). Ferenc Pecsli, eng. DDD. TT: 2:27:03

*Il Pastor Fido* exists in three versions; this is the third. The booklet which accompanies these discs offers an intelligent and informative essay about the operatic conventions of the time, the reasons why Händel kept recomposing ("regrouping" might be a better word) the work, and much more. This version might be termed a pastiche, since 20 of its 27 vocal pieces are borrowed from other works by the composer, but never mind—suffice it to say that what we have here is a delight, a welcome addition to the ever-growing catalog of this great composer's works for the stage. And frankly, I don't mind hearing the master's own pieces reworked and replaced: the final-act duet (CD2, #35) is taken, lock, stock, and barrel,

from *Teseo*, and I like it just as much here as there.

The star of the performance is the Capella Savaria, a 25-member group which plays on "period" instruments. The sound they produce, under Nicholas McGegan's expert leadership, is crisp, clean, and clear, without some of the nasty edginess one occasionally encounters in such groups. (The engineers, too, are to be commended.) The horn players in particular perform with a real mellow sound. Since each act ends with a series of dances (very British, this work), the instrumentalists' roles are that much greater than usual, and they are a wonderful group.

Among the singers, I'm pleased to report that the two leads, with plenty to do, are as good as they are. Paul Esswood's talents are well-known, and aside from some unpleasant hootiness which creeps into the upper end of his countertenor from time to time, he turns in a fine performance as Mirtillo, the faithful shepherd of the title. He imbues each aria, whether fast or slow, with just the right feel and flow, and pays close attention to the predictable text. His singing of "Caro amor" (CD1, #23) is gorgeous in its lullaby-like simplicity. As his beloved, Amarilli, soprano Katalin Farkas is charming, with a voice which reaches effortlessly up to a high D-flat in her big (9-minute!) Act I aria, and which is fluent in the score's florid passages, of which there are many.

Of the smaller parts, mezzo Marta Lukin makes the best impression as Dorinda. While not quite up to the rigors of the coloratura in her music, she has a nice, full tone and uses the language well. Maria Flohr as Eurilla has an empty voice; Jozsef Gregor, with little to do, displays a nice sound which is weak at the bottom; and Gabor Kallay, in the important tenor part of Silvio, is a mess. He makes hash of the fast music and has pitch problems. The chorus, in its brief appearance, is magnificent.

As hinted above, McGegan cannot be praised too highly. The opera almost makes dramatic sense under his leadership, so involved are the performers. And he has supplied the singers with swell embellishments for the *da capo* arias without bruising the vocal line. The sound is not to be faulted, and the booklet contains a four-language libretto. Reservations aside, I recommend this heartily: there's much music here to revel in.

—Robert Levine

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**LISZT: Piano Music**

Sonata in b; 3 Paraphrases from *Rigoletto*, *Il Trovatore*, and *Aida*

Daniel Barenboim, piano

Erato ECD 75477 (CD only). P. Scheuremann, eng.; W. Mayer, prod. DDD. TT: 61:42

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Barenboim's Liszt Sonata is a disappointment. His first recording of it, also coupled with the *Rigoletto* paraphrase, was more sensitive and alluring in cantabile passages. Here I feel there is not even that, the central "slow movement" section and coda lacking any mystery or magic. Of the rest, he seems unable to muster the power essential to turn the many passages of extravert rhetoric into convincing argument. I was quite prepared to blame this on the piano and the dryish acoustic until it became apparent that Barenboim was reserving the *n*th degree of weight for the *fff* final climax. Only then, with some of the harshness of this passage still lingering in my mind when I should have been taken up by the coda, was I convinced that this interpretation didn't work; there is no feeling of inevitability, no obvious ordering of details within this all-important architectural structure and, perhaps most disappointing of all, no captivating flight of imagination. Furthermore, liberties appear to have been taken with pedal and dynamic markings to no positive effect.

The *Rigoletto* and *Trovatore* paraphrases are vivid and played with a certain amount of panache, but again there are too many statements that Barenboim seems unable to sustain; they simply sound frail when they should be majestic. The delicacy of much of the *Aida* paraphrase suits him better—pity about the sudden rush of (mic) noise 20 seconds before the end.

—Barbara Jahn

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**MAHLER: Symphony I**

Bernard Haitink, Berlin Philharmonic

Philips 420 936-2 (CD only). Cees Heijkoop, Willem van Leeuwen, engs.; Volker Straus, prod. DDD. TT: 57:02

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Someone once wrote of Daniel Barenboim that he never allowed himself to be a young conductor, learning his craft under the mentorship of Otto Klemperer and showing an early affinity for such decidedly uncapricious works as the consecrated symphonies of Anton Bruckner. Bernard Haitink, now a conducting elder, stresses the complementary tendency: making the youthful work of an especially mercurial composer sound measured, refined—in short, mature.<sup>2</sup> There is a case to be made for this approach to Mahler's First Symphony, for it is more finished, more formally perfect, if less great, than the two symphonies which follow. (One strains to imagine a weedier masterpiece than the *Resurrection*.) Haitink makes his case fairly well—better than in his flaccid second

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<sup>2</sup> Some would argue that Simon Rattle shows both tendencies simultaneously.

Concertgebouw recording from the beginning of the '70s, reissued by Philips on unjustifiably full-priced CD (420 080-2). Thus the opening tones, for once, sound primeval and timeless. The second-movement *Ländler* is winningly graceful: in other hands this would seem unidiomatic and un-peasantlike, but Haitink has made such mellow *Ländlers* a consistent delight in his Mahler performances. His broad view also allows for strong contrasts in tempo and deft transitions between themes in the last movement. On the debit side, the third movement is a dud, featuring a *Klezmer* band in the guise of a Viennese salon orchestra. And, as is so often the case with Haitink's Mahler, once the refinements have been duly noted, one wishes for a bit more gut excitement.

Haitink's emeritus status with the Concertgebouw Orchestra allows him to roam farther afield to record. His new partnership with the BPO works to good effect. The precision of the Berlin players, which through Karajan's usage produce so many performances of extravagantly shallow technique, serves here as an ideal counter to Haitink's geniality.

The CD sound is in strong contrast to the old Amsterdam recording, at least to my LP copy, the former well-etched as with the better commercial CDs, the analog record gloopy by contrast, though having the classic, creamy Philips reproduction of massed strings. Soundstage on CD is solid if lacking in body. Instrumental timbres are unremarkable, though agreeable. One exception: this is one of the rare recordings where you can hear the highest violin notes in the opening passages; the sound is so piercing I'm not sure you'll want to hear them. Part of the etched, unspatial quality of this recording may owe to the recording venue of the Berlin Philharmonie, a hall as dry and clinical as the Concertgebouw is reverberant.

This would make a decent choice for a broad reading of the First if you must have it on CD. I might suggest instead waiting for Horenstein's LSO performance to appear on Unicorn CD. It shares with Haitink's the expansive tempi, but little else; indeed, Horenstein's packing of so many ideas into this symphony may say more about the conductor than the young Mahler, but such was Horenstein's greatness. Since I come increasingly to hear this as a youthful work, my only unreserved recommendation is for Andrew Litton's brash, impetuous, unsubtle, and thoroughly refreshing reading on Virgin CD (VC-790703-1)—this despite the bright, denatured, and hazy recording. It is generously and appropriately coupled with the four Wayfarer songs, making the Haitink seem stingy as well as dull by comparison.

—Kevin Conklin

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**MENDELSSOHN: Piano Concertos 1 & 2; Hebrides Overture**

Joseph Kalichstein, piano; Scottish Chamber Orchestra, Jaime Laredo  
Nimbus NI 5112 (CD only). TT: 52:15

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While Joseph Kalichstein certainly has the measure of Mendelssohn's virtuosic writing for the piano in these Concertos and responds with an impressive cantabile to the more lyrical sections and movements, his technical assuredness in faster passagework (particularly that of the first movements, marked *con fuoco* and *appassionato*) is used to suggest an air of frantic activity that I find alien to Mendelssohn's idiom. But there is a commitment to this interpretation that at least commands attention, and the superb SCO under Jaime Laredo, mindful of every detail and dynamic nuance, quite obviously plays with the same dedication here.

Less commendable is the *Hebrides* Overture. By comparison, it is lackluster, and more than once I felt that Laredo was finding it difficult to settle into a steady tempo, with the result that some orchestral entries are decidedly tentative. But it was a good idea to separate the concertos here with such a work in order to mitigate the effect of the unpleasantly washy piano sound, so dominant over the orchestra, which, in its more distanced setting, readily tells of the large empty hall it is working in. There seems to be a right-hand bias to the recording, too, which may need to be corrected from the outset.

—Barbara Jahn

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**MENDELSSOHN: Twelve String Symphonies**

William Boughton, English String Orchestra  
Vol. 1: Symphonies 1–6. Nimbus NI 5141 (CD only). DDD.  
TT: 59:44

Vol. 2: Symphonies 7, 8, 10. Nimbus NI 5142 (CD only).  
DDD. TT: 52:24

Vol. 3: Symphonies 9, 11, 12. Nimbus NI 5143 (CD only).  
DDD. TT: 70:47

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Felix Mendelssohn was the kind of guy you would have hated in public school. Between the ages of 12 and 13—when most of us were worrying about pimples and the next episode of *Gilligan's Island*—he was composing, among other works, these pieces for string orchestra (not to be confused with the later, more familiar five symphonies for full orchestra). These are accomplished works, in three, four, or five movements; while not revelatory art, they are almost perfect in their own way, and illustrate young Felix's admiration of his great symphonist predecessors.

Just because this music is juvenilia is no reason for it to be played sophomorically. Boughton and the English Stringers play almost moonily, leading me to wonder if they understand any articulation other than *legato*. Nim-

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bus's liner notes mention prominently the influences which great composers had over Mendelssohn in certain of these symphonies; perhaps this is why the musicians seem hell-bent to emphasize the significance of this music. It's inappropriate; the abundant counterpoint has none of the transcendence of Bach's or Mozart's; what they *should* have emphasized is the music's inherent deftness, ebullience, and charm.

Sound is classic Nimbus: distant and magnificently reverberant, free of any microphone-induced holographies, with a blooming mid-range and a generally sweet string tone. Overtones on strings are largely to be heard, with only slight edge in mid-treble. While the music makes predictably few demands in the low frequencies, what there are come through rich, full, and percussive, as with the bass pizzicati in 6.iii.

Unfortunately, this is the only performance of all 12 symphonies available today in any format. I remember hearing a Vox Box set from about 1980—I believe with the Mainz Chamber Orchestra, but honestly can't remember—which sported far more sympathetic performances. Would that the new owners of the Vox catalog see fit to reissue them!—**Kevin Conklin**

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**MOZART: Symphonies 35 ("Haffner") & 41 ("Jupiter")**

**HAYDN: Symphony 104 ("London")**

René Leibowitz (41), Josef Krips (35 & 104), RPO Chesky CD 16 (CD only). Kenneth G. Wilkinson, eng.; Charles Gerhardt, prod.; David & Norman Chesky, exec. prods. ADD. TT: 67:40

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All of these recordings date from 1962 and were originally released under the *Reader's Digest* imprint. For many collectors, a key question will involve the extent to which the remarkable brothers Chesky have effected still another impressive digital revitalizing of analog material. Not having the original LPs for comparison, I find it impossible to offer what might be a conclusive judgment. Still, certain positive features are evident simply from listening to this disc. For one, there is a remarkably quiet background, with tape hiss so minimal it might well pass for hall ambience. What is more, the quiet background has been achieved without untoward trimming of high frequencies. In fact, the one disappointment here (*vis-à-vis* other Chesky releases I have heard) is a slight stridency of string tone (especially in the "Jupiter"), which might have been neutralized with a different equalization. On the other hand, balances remain exemplary in all three works, even in the "Haffner," which is recorded with a more distant (and natural) perspective that also suggests greater depth than exists in the

closer, more two-dimensional soundstage of the two other recordings. All three, however, boast an uncommon transparency that is especially well-suited to this repertory.

Musically, the René Leibowitz account of the "Jupiter" may prove the most attractive. It is strikingly similar to the 1945 Toscanini recording of the work: taut, fleet, with almost no rhythmic inflection. To avoid sounding mechanical, such an approach must take special care to clarify inner voices, countermelodies, and polyphonic texture, and this is precisely what Leibowitz—and the engineers—have done. Indeed, George Szell is the only other conductor I can recall who managed to produce the same kind of sharply focused detail in the finale's richly textured coda, surely one of the miracles of orchestral polyphony. And in the slow movement, where Leibowitz is a trifle more relaxed than Toscanini, exceptionally clear winds intensify color and italicize harmonic motion.

The two performances led by Josef Krips, though often splendid, are somewhat less distinguished. The finale of the "Haffner" is just a bit too genial and leisurely for a movement that Mozart marked *Presto* and directed to be played "as fast as possible." And the two opening movements of the Haydn are a bit slick, lacking the weight, inflection, and breadth needed to suggest how the "London" Symphony, more than any other by Haydn, anticipates Beethoven. Nevertheless, both performances have their good points, the first movement of the "Haffner," despite one awkward breath-pause, being especially spirited, the finale of the "London" having a color and power not always encountered. The only exposition repeats observed in all three recordings are those in the second movement of the "Haffner" and the finale of the "London."

There are, to be sure, many fine performances of all three works already in the CD catalog: for the "Jupiter," those of Sir Colin Davis (Philips), George Szell (CBS), and Leonard Bernstein (DG); for the "Haffner," Bernstein (DG), Szell (CBS), and Pierre Monteux (Preludio); and for the "London," Jeffrey Tate (EMI) and Davis (Philips). But no CD offers this combination of three works, and buyers who want this particular grouping will not be disappointed with the Cheskys' latest success.

—Mortimer H. Frank

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**RACHMANINOFF: Concerto No.2; Etudes-Tableaux, Op.39, Nos.1, 2, 4-6, 9**

Evgeny Kissin, piano; LSO, Valery Gergiev (Concerto) RCA Victor 7982-2-RC (CD only). Mike Hatch, eng.; Andrew Keener, prod. DDD. TT: 59:51

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The now 17-year-old Evgeny Kissin, Moscow-

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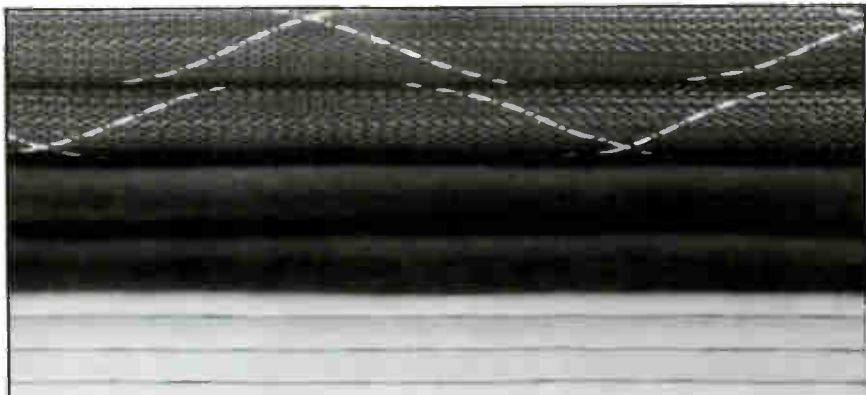
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born and -trained, was already spoken of with awe by those who had heard him as a *wunderkind* not too many years ago. I recall being enthusiastically told about him by both Andras Schiff and Soviet pianist Tatiana Nikolayeva. Fingers Kissin certainly has; that, and a large, splashy tone, not to mention a degree of polish that pianists twice his age might envy. Yet, though this might be a minority report, I must admit to being disappointed interpretively by much of what emerges here. Overall, the most impressive moments occur in the finale of the concerto, where real excitement finally fires up the performance. In the Etudes as well, for example Nos. 2 in a and 4 in b, the gloomy atmosphere does effectively get conveyed, and there are even traces of spontaneous temperament; too often, though, in spite of the beautiful control throughout, the motions seem to me not internalized but predominantly rendered for the sake of effect. Even though the interpretation may be full-toned and large-gestured, much of the concerto sounds too deliberate and over-italicized, a state that applies equally to the conducting. I am left, certainly, with technical admiration for Kissin, but little awareness of the performer's potential for stirring the soul. The smooth-sounding reproduction of the piano and well-detailed orchestra, nicely imaged, is impressively rich and full-bodied.

—Igor Kipnis

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#### SIBELIUS & NIELSEN: Violin Concertos

Cho-Liang Lin, violin; Esa-Pekka Salonen; Philharmonia Orchestra (Sibelius); Swedish Radio Symphony Orchestra (Nielsen)

CBS Masterworks MK 44584 (CD only). Tim Geelan (Sibelius), Bud Graham (Nielsen), engs.; Steven Epstein, prod. DDD. TT: 69:17

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"Is this a game of chance?" asked the sucker as W.C. Fields dealt him a poker hand.

"Not the way I play it," Fields muttered.

Are the violin concertos of Sibelius and Nielsen any good? Not the way these folks play them. At least, I don't *think* so. The sound is so poor on this CD that I am hesitant to discuss the music for fear I didn't really hear it the way it was performed. I certainly hope I didn't. Both concertos have a last-row, balcony perspective—all ambience and no instruments. That they were recorded by two different engineers in two different halls with two different orchestras is an astounding feat of consistent maladroitness.

But the statutes don't allow for divorce between players and engineers, and so the bad news: The music that comes from this disc is as cold as a Scandinavian winter. The first few bars of the Sibelius seem to capture the composition's dreamy, ephemeral quality, but the

enchantment pretty much ends there. Throughout this and the Nielsen, the phrasing—is too voluptuously rounded; attacks are enervated; dynamic range unexploited. Almost Mantovani-like, the melodic sweep is coated with an "E-Z listening" patina. The playing, in short, is anemic and frigid.

All too rare are the glimpses into the beauties of these works. Portions of the Sibelius second movement are given charm and repose, and there is an occasional winning phrase in the Nielsen. But the high spirits found in other recordings of the opening of the Sibelius third movement turn menacing and malevolent here. What should be soaring transitions between the contrasting sections of the two Nielsen movements are plodding chores in the Lin/Salonen traversal. In many spots, it sounds almost as if the musicians are simply going to stop and fall asleep. Would that they had.

All that out of the way, it must be said that the sound quality is a major accomplice to the poor impression made by the playing. There is not a trace of natural brilliance to any of the instruments, even less detail. Listening to this music is like trying to tie your shoes with wool mittens on: you just can't get a grasp. Totally disembodied, the sound is glassy and distant. At times, I pitied the soloist as he sawed mightily through a *forte* figure only to have the volume remain exactly level. There is almost no difference between the softest violin passages and the loudest!

There's more, but why bother? This release is an injustice to Sibelius and Nielsen. Do them—and yourself—a favor. Choose any recording but this one.

—Robert Hession

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#### WALTON: Symphony 1

VAUGHAN WILLIAMS: *The Wasps Overture*

André Previn, LSO

RCA 7830-2-RG (CD only). James Lock, eng.; Peter Dellheim, prod. ADD. TT: 52:14

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Walton's Symphony 1 has been recorded some half-dozen times since 1935, when it was first committed to 78s by Sir Hamilton Harty with the LSO. Conductors identified with the work have included Boult, Gibson, Handley, Previn, the composer, and, most recently, Leonard Slatkin, whose Virgin recording with the LPO was reviewed in the November 1988 *Stereophile* by Barbara Jahn.

Many collectors regard Previn's 1966 RCA recording of this work as the one to beat, and that Previn himself could only manage a pale shadow of this performance in his recent Telarc remake with the RPO.

Harty's recording, reissued in 1985 on LP in England by Decca (414 659-1), provides a look

at the symphony as a then new and difficult work, but its rough playing and dated sound make it an archive curio.

The work is grand though flawed, sprawling, and overinflated, but in the right hands it can take the listener on an emotional roller coaster as few works can. Previn and the LSO succeeded in doing so to a greater extent than any other performers until Slatkin, whose performance I admire more than Barbara does. Slatkin succeeds in characterizing as well as energizing virtually every detail in Walton's nervous writing, as well as gaining better control over the big climaxes. But though Previn left a few stones unturned, and was just slightly less tidy, his landmark recording still gets the nod for its overall, start-to-finish visceral involvement.

Moreover, the analog sound of Previn's recording is far more listenable than the Virgin digital, which sounds like a high-order, odd-harmonic ranch in the big tuttis, even with a CD Damper Ring attached. The CD Damper Ring is not a magic fix; it brings out the best of your good CDs, but, like a precocious child, it tells you the frank and brutal truth about your bad ones. The sonic deficit is most unfortunate for Slatkin, for his performance is the only one to come along which can stand up to Previn's.

Owners of the original LP are concerned about the obvious downward gain-riding just prior to the Finale's first big climax. The gain ride sounds a bit different on the CD, as though the remastering crew tried to unride it. They didn't quite make it, but it was a nice try. Otherwise, the sound is clean, open, lively, and dynamic. Collectors would be hard pressed to find an RCA LP from that period that sounds as good as the CD reissue.

Previn's performance of Vaughan Williams's *Wasps* Overture will come as a shock to those accustomed to the soft-textured, easygoing style with which Sir Adrian Boult conducted the piece. Previn does it with the type of high energy one would expect of a performance of Bernstein's *Candide* Overture. It works fine that way, and makes an excellent filler.

—Richard Schneider

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**VAUGHAN WILLIAMS: Symphony 4, Concerto Accademico**

Kenneth Sillito, violin; Bryden Thomson, LSO  
Chandos ABRD 1322 (LP), CHAN 8633 (CD). Ralph Couzens, eng.; Brian Couzens, prod. DDD. TT: 50:25

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The London critic Frank Howes—influential in the '50s—described Symphonies 4 and 6 of Vaughan Williams as prophetic works, the F-minor showing “the nature of naked violence triumphant in Europe.” It's a view discounted today: more careful analysis shows the seeds of biting dissonance in earlier works, and prac-

tically nothing by the composer was without some reflection of humor. The liner-note rather misleadingly plays down the tragic aspects of the Symphony.

Modeled on Beethoven's Fifth, with linked scherzo and finale, and thematic back references, the Fourth was premiered by Adrian Boult in 1935. At the time, the composer credited the conductor with showing how the Andante should go in performance; he said that he had felt uncertain of it. But the definitive recording was to come from the composer himself, and by temperament Boult was less suited to this symphony than to others in the nine. Ironically, Fred Gaisberg (who produced the 1937 recording with the BBC Symphony Orchestra), normally astute, saw the composer's undemonstrative manner as indicative that “he had not the equipment for a good conductor.” VW made no other recordings of his own music.

Fortunately, a new LP transfer of those historic 78s was issued by EMI only last year in the UK (EH 769168 1). It lacks something of the impact of a superior, earlier EMI/World Records transfer, but remains as counterbalance to the 3–4m broader readings of Boult and Thomson—whose Chandos recording just noses ahead, with its more dramatic bite and modern sonics. Boult's Andante lacks tension, and there is more bravura in Thomson's Scherzo. However, nowadays I appreciate more Boult's concern for clear textures and his seeking for the contemplative Vaughan Williams of the surrounding Symphonies 3 and 5 (both completed in the Chandos/LSO cycle, neither as recommendable as this Fourth). I say “nowadays” because my acquaintance of the work was made through the two superb NYPO recordings, respectively under Mitropoulos and his successor Bernstein. The brass had a virtuosity to put the LSO's well behind; the older version was a souvenir of the Orchestra's 1956 Edinburgh Festival appearance, where their corporate brilliance and intensity dazzled critics. The CBS stereo recording by Bernstein was just as fine, and ought to be transferred to CD—say with his Britten *Peter Grimes* Interludes. Disappointingly, Bryden Thomson's players—especially the LSO strings—don't convey the feeling of the slow movement well, not even the lamenting flute solo at the end. There's a certain *nobilmente* that has you thinking of Elgar, but Vaughan Williams himself was so much more involving. I like the power of the outer movements, and the abrupt ending leaves you pent up. It was a stroke of inspiration to complete the CD with the neoclassical Violin Concerto, with strings, of 1925. This restores equilibrium, and the former leader of the



Gabrieli Quartet is an adequate soloist. (James Oliver Buswell, with Previn/LSO on RCA, brought more finesse to the piece.)

There's a narrow avoidance of blurring, by the acoustic of the North London church used. The violinist is close to the mics in the fill-up, and there's the impression, prevailing throughout the series, of rather louder than ideal orchestral playing. But this may just be the bold Chandos manner. — Christopher Breunig

## Classical Collections

FRANCK: *Symphony in d*  
D'INDY: *Symphony on a French Mountain Air*  
BERLIOZ: *Beatrice and Benedict Overture*  
Pierre Monteux, CSO (Franck); Henriot-Schweitzer, piano (D'Indy); Munch, BSO (D'Indy, Berlioz)  
RCA 6805-2-RG (CD only). Lewis Layton, eng.; Richard Mohr, prod. ADD. TT: 71:48

When this performance was recorded (Jan. 7, 1961), the Franck Symphony in d had become one of the repertoire's most overplayed war-horses. This late-Franco-Belgian Romantic crowd-pleaser is lushly orchestrated, its themes are almost simplistically melodic, and its form is as easy to follow as that of Dvorák's "New World" Symphony or Tchaikovsky's 5th. Even by 1961, it was easy for a professional musician or advanced listener to snobbily dismiss the Franck as fatulent orchestral rhetoric. Although the work has not been neglected during the intervening years, it has been given a slight rest during which the rising crop of curly-haired moppets and their public could catch up with Mahler. Even so, it takes this performance by a curly-haired senior citizen, 85 when this was taped, to make a case for the Franck D-Minor that any admirer of Stravinsky, Bartók, Hindemith, and beyond, can enjoy without embarrassment.

Monteux (as was Fritz Reiner, during whose tenure as CSO Musical Director this engagement took place) was an exponent of Less-Is-More in music making. His gestures were precise and economical, his instructions concise and practical. Here he leads the orchestra through an honest, heartfelt, yet utterly unexaggerated performance of a work which many of us have come to disdain, and the result becomes an archive treasure.

The combination of Monteux's tastes and the propensities of the Reiner-polished CSO are evident throughout, but are particularly evident in the highly characterized accompaniments, as in the intensity and precision of the tremolo string figures which must (and can) be heard to be believed. The clarity and precise voicing of the woodwind and brass choirs are yet more hallmarks. The opening figure of the

second movement, scored for harps and strings, sounds nearly as if played by a single giant harp. The second-movement cor anglais solo by Laurence Thorstenberg has never been surpassed, and the unisons between horn and clarinet are startlingly perfect in one of wind intonation's most hazardous booby traps.

This CD has powerful sonic interest as well. It is a Mohr-Layton product from pre-renovation Orchestra Hall, and bears much in common with the legendary Reiner recordings. Monteux retained the traditional antiphonal seating for first and second violins throughout his career, even though other conductors of his generation, including Reiner, were abandoning it. The payoffs in this recording can be heard in the upper harmonics of the bass section, spread out in a single line at the left rear of the stage, with the bodies of their instruments facing out into the hall. One of the most fun payoffs is the chance to follow the truly antiphonal scoring of the tremolo variation figures tossed back and forth between the first and second violins and violas in the second movement, and to catch the change of timbre when the seconds remove their mutes and make their first *senza sordino* entrance.

RCA's original LP has had a checkered reputation among collectors. Its potential excellence was marred by grossly overloaded tuttis which had the character of opaque smears. This was one shaded dog that did bite, and was not at all house-trained. Many of us believed it was recorded that way, that Lew Layton miscalculated his levels and saturated his tapes. RCA's later Point-5 Edition did nothing to allay this suspicion. This CD should lay that bromide mostly to rest. Produced from the session master, the CD unveils the tuttis with awesome power and a degree of clarity which should not send you running to your volume control. Admittedly, the possibility of high-level saturation remains, but the CD provides such an improvement over the LP as to constitute the difference between night and day. In view of the Fundamentalist Vinyl Minoritarians who will pass the CD by, I hope that Chesky will produce an LP of this recording. I'd like to hear it myself. In the meantime, this CD will do more than nicely.

Vincent D'Indy was a near contemporary of Franck, and numerous works of his were considered standard repertoire during the 1930s and '40s. I'm not certain that a crusade on reestablishing D'Indy is warranted. *Symphony on A French Mountain Air*, in practical terms a quasi-piano concerto, strikes me as a harmless puff. The performance by Nicole Henriot-Schweitzer, with the BSO under Charles Munch, transcends the musical substance of the work,



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as only Munch and his eccentric and characterful BSO could do. Delightful.

It would seem that the contents of the brilliant Munch/BSO Berlioz Overtures LP of 1959 have been destined to a diaspora of Papillon CD fillers. This one, *Beatrice and Benedict*, is worthy bonus indeed to a mid-price bargain.

—Richard Schneider

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Robert Noehren, David Britton, David Higgs, Todd Wilson, Catharine Crozier, Michael Farris, organs

Delos D/CD 3503 (CD only). John Eargle, eng. & prod. Durufié only: George William, eng.; George Baker, prod. DDD, TT: 70:03

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After the high school chorus and a rock group or two, the aspiring young recording engineer usually turns to the pipe organ. This often happens as the result of the purchase of new microphones with better bass response, which are no longer challenged by the school's battered upright piano or the 60Hz boom of an electric bass. Every community in God's Country has at least one church, and the church that doesn't have at least an electronic organ is a rarity.

But it really takes a large pipe organ to show off a good pair of microphones, and if it is surrounded by a large acoustical space with a satisfyingly prolonged reverb time, so much the better. Under those circumstances, it is almost impossible to make a *bad* organ recording, which is why large pipe organs are still the most popular microphone targets among recordists who are into *big* sounds. There's quite a difference, though, between a good pipe-organ recording and a superb one, and a recordist who sets high standards for his own work can easily spend months of experimentation with a single instrument before he either gets what he wants or resigns himself to the fact that the organ, the space, or both are beyond redemption. Eventually, he may become proficient enough to routinely produce tapes as good as the ones on this stunning recording.

I was not altogether enchanted with John Eargle's treatment of the symphony orchestra on *The Art and Science of the Symphonic Soundstage* (see last month's issue), the companion piece to this disc, but when it comes to recording pipe organ, the man is a virtuoso. Certainly, he has a lot of competition; there are probably more excellent recordings of pipe organ in the current *Schwann* catalog than of any large musical instrument (and I consider

a good orchestra to be an instrument), and many of equal merit have long ago passed into black-diamond oblivion. But most to date have been analog-mastered, which is okay if the tape deck was an Ultramaster like Wilson Audio uses. But most were not, and tended to roll off rapidly below 40Hz. Regardless of how enamored one is with analog sound, the fact remains that the digital medium—with its smooth, limitless low end and extraordinary dynamic range and signal-to-noise ratio—is tailor-made for the pipe organ.

The recordings on *King of Instruments* are stunning! Every hall has its unique acoustical signature, and the ratio between direct sounds and reverberation is just about perfect throughout. And, of course, there's plenty of the floor-shaking low end that has always made pipe organ a favorite instrument among audiophiles who paid dearly for 30Hz bass range and rarely hear anything like it from symphonic recordings. (Of course, if it's *real* infrasonic energy you're looking for, what you need is a couple of sound-effects recordings like Bainbridge's *Sonic Booms*.)

Unlike the *Symphonic Soundstage* CD, which included a number of rather pedestrian performances, those on *King of Instruments* are outstanding. Even during the slowest passages there is motion and excitement; there's not a plodding performance on the disc. In fact, *King of Instruments* is that rarest of rare phenomena: A gorgeously recorded collection of wonderfully played musical performances that can be enjoyed for the music, the playing, or the magnificence of the sound, or all three at once if you can stand such a sensory assault! And if you're into do-it-yourself pipe-organ recordings, you'll even learn a great deal from the very detailed booklet that comes with it.

Most highly recommended.—J. Gordon Holt

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## Jazz & Blues

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**RICHELIE BEIRACH & JOHN ABERCROMBIE:**  
*Emerald City*

Richie Beirach, piano; John Abercrombie, guitar synthesizer

Pathfinder Records PTFCD 8703 (CD). David Baker, recording mixdown eng.; Richie Beirach, David Baker, John Abercrombie, Douglas Licherman, prods. DDD. TT: 47:16

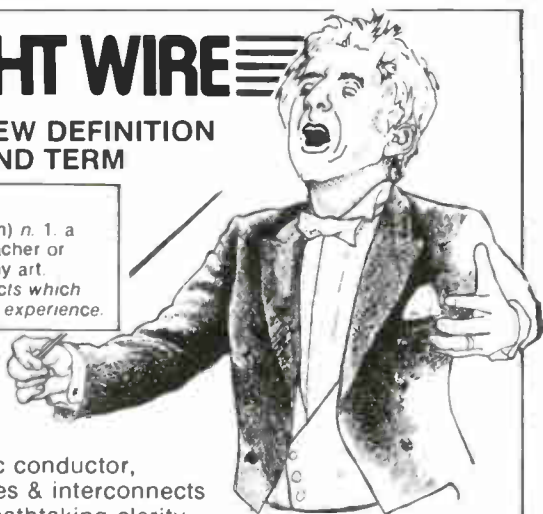
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While somewhat "far-out" in orientation, the music in *Emerald City* seems decidedly less so when compared to the efforts of even such early concert-world modernists as Schoenberg, Stravinsky, and Cage. As to whether or not it's jazz, you'll have to make up your own mind. I don't hear it that way nor, more impor-

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tantly, do I find most of it very engrossing simply as music.

One is frequently struck by a feeling of otherworldliness; in the opening "Odin," for example, a slowly pulsating *basso ostinato* underlines wailing, organ-like sonorities that often seem to emanate from behind a scrim. Here and elsewhere, melodic fragments, *glissandi*, and atonal rushes of sound are combined in partly improvised, partly composed tonescapes. Although Beirach and Abercrombie (performing on acoustic piano and guitar synthesizer respectively) engage in some interesting dialogs, don't expect to find anything that swings in the usual sense.

Beirach's "Anse des Flamands" makes a stronger appeal to the heart than much of the other material. Its haunting main theme is evocatively cast in the romantic "movie-theme" tradition, with a hint of flavoring from the mid-East. "Slight of Hand" is a pointillistic, often puckish romp that bristles with intriguing cat-and-mouse hocketing from player to player.

"On Overgrown Paths" forms the album's most ambitious undertaking. Cast in four sections and a coda, thematic-intervallic relationships (such as those that link the work's opening and close) provide a sense of unity. But on a more meaningful level, the proceedings all too often dissolve into gimmicky effects that stress sound over substance. Personally, I put the lion's share of this music in the category that is more fun to create and perform than to listen to.

Not surprisingly, the final sonic product has been heavily processed. As you'd expect, there's lots of reverb and you'll often feel as if you're in the midst of a sonic swirl. All of which seems entirely appropriate for the music at hand, and serves to enhance its collage aspects.

—Gordon Emerson

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**ETTA JAMES: *Seven Year Itch***

Island 91018-1 (LP), -2 (CD). Barry Beckett, Rob Fraboni, Ricky Fataar, prods. ADA/ADD. TT: 35:42

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Jamesetta Hawkins is a national treasure. Now, with that out of the way, we can discuss her latest album.

Better known as Etta James, Jamesetta has been making hit records since "Roll With Me Henry" in 1954, and is probably best known for her recordings made in Muscle Shoals, Alabama in the late '60s and '70s. But her latest album contains some of her best work ever.

It's named *Seven Year Itch* because it's been seven years since Etta wanted to record a studio album. No reasons given, but she makes a point of including a liner note that tells the world that her life has been changed for the better by a stay at the Betty Ford Clinic. She also thanks old

friends Steve Cropper and Barry Beckett for helping her get back into the studio. (A keyboard expert, Beckett produced her famous *Tell Mama* sessions 20 years ago.) Ms. James kept busy during her studio hiatus, working on movie soundtracks for *Saxo*, *Taps*, and *Heartbreakers* as well as appearing in a "Miami Vice" episode and Chuck Berry's *Hail, Hail Rock 'n Roll*.

There are 10 new songs on the album, all a little over-produced in my opinion, but well worth hearing if only to listen to one of this country's best voices. "The Jealous Kind," "I Got The Will," "Come To Mama," and "Shaky Ground" are all standout cuts, but the jewel on the record is "Damn Your Eyes," a lament to being in love despite all one's better judgment.

Recording techniques have changed over the years but, in this case, the producers didn't capture Etta's masterful and powerful voice, placing it a little too far back in the mix and rounding off the edges a little too much. This was never what Etta James's music was all about. I based this opinion on auditioning re-releases of Etta's earlier recordings and catching her live, in December, at the "Great American Music Hall" in San Francisco. There's no question that there's a lotta singer there. Unfortunately, that just barely comes across on *Seven Year Itch*.

Still, it's worth auditioning. Better yet, buy a copy so you know what songs she'll sing when you see her live. Both formats are recommended. The songs were recorded on an analog machine but digitally mixed down. Both the LP and the CD are of good quality, and both contain the same number of songs.

—Gary S. Krakow

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**TURTLE ISLAND STRING QUARTET: *Metropolis***

Darol Anger, David Balakrishnan, violins; Irene Sazer, viola, violin; Mark Summer, cello

Windham Hill Jazz WH-0114 (LP), WD-0114 (CD). Brian Walker, eng.; Anger, Balakrishnan, prods. ADA/ADD. TT: 45:02

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After last year's strong, if not perfect, debut album (reviewed November 1988), the TISQ has released an even better sequel. Like its predecessor, *Metropolis* is devoted to TISQ's commitment to proving "the compatibility of [jazz] and the string quartet form," as the liner note has it, and is similarly split between standards and originals. Unlike *TISQ*, the originals here are uniformly strong compositions, not at all cowed by the company of "Naima," "Sidewinder," "Ecaroh," and "Jaco." Mark Summer's solo-cello "Julie-O" is positive American social realism—you can just see Our Happy Tractors making that plough down sillion shine—and Darol Anger's "Street Stuff" puts the whitest of hillbilly twangs on some pretty black urban

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syncopations. The quartet replicates Lee Morgan's burbling proto-fusion funk groove on "Sidewinder" with rhythmic precision, and Pat Metheny's "Jaco" sounds just as fresh, if too darkly strenuous, in TISQ's almost verbatim transcription. But the all-too-democratic "Naima," all four strings playing at all times, unfortunately does away with whatever peace and serenity Coltrane wrote into the notes.

TISQ works very hard; that's the only problem with *Metropolis*. From the lepidopterological onomatopoeia of Balakrishnan's "Mr. Bumble" to Bruce Williamson's "Four on the Floor," they seem to strain to put across tough arrangements in a frenzy of overachievement. There's a lot of unnecessary sawing away here, and not a whole lot of sustained tones or even much use of the extreme dynamic range that comes with the string quartet territory. Instead, the percussive possibilities of the string family are explored, though not thoroughly enough to make you forget the violin's home turf: sustained notes not dependent on breath.

There's virtually no difference between LP and CD. Too bad; the recording sounds dry, suffocatingly close, and multimed in both formats. Otherwise, *Metropolis* is an almost totally satisfying release—there's much of quality here that I haven't space to itemize—and highly recommended.

—Richard Lehnert

## Popular

### EMMYLOU HARRIS: *Bluebird*

Reprise 25776-1 (LP), -2 (CD). Donovan Cowart, Mark Richardson, engs.; Richard Bennett, Emmylou Harris, prods. A/DDA, A/DDD. TT: 39:18

Here's something so obvious that I haven't heard it said in a long while: The mark of an excellent singer is her ability to make a collection of disparate songs by different writers sound as if each was written by the singer herself. Frank Sinatra, Betty Carter, George Jones, and Emmylou Harris are such singers.

After the all-acoustic, all-gospel *Angel Band* and the hugely popular *Trio*, both from 1987, Emmylou Harris has returned to the sort of solid, dependable, varied album she seems able to make in her sleep. *Bluebird* shares much with *White Shoes* and *Light of the Stable*, perhaps because lead guitarist/co-producer Richard Bennett is a virtual stylistic clone of Frank Reckard, lead picker on the earlier albums. Her 15th record (not counting *Trio* and the two *Profile* repackagings), *Bluebird* is mainstream country rock in the Gram Parsons tradition that Harris herself was instrumental in developing: a bag of ballads, two-steps, and the obligatory waltz and bluegrass stomp. But there are still a few new twists: she turns John Hiatt's lone-

some hillbilly yodel, "Icy Blue Heart" (from last year's *Slow Turning*), into a breathtaking aria for country coloratura.

Part of Harris's genius has always been her choice of songs; writing little herself, she skims the cream of contemporary country writing, never making an obvious choice but seldom stretching awkwardly, each of her albums a progress report on the state of the country-song-writing art. *Bluebird* includes a song-and-a-half each by Harris and husband Paul Kennerly, Kennerly's "Heaven Only Knows" sounding much like much of *The Ballad of Sally Rose*, co-written with his wife. On the token country standard, "Lonely Street," the almost excessive reverb on Harris's dry voice makes her sound as if crying in a sonic wilderness (not a criticism), punctuated by rumbling timpani (!). Songs by Rodney Crowell, Tom Rush, and the McGarrigle Sisters round out the collection, but the liveliest tune here is the bluegrassy "Heartbreak Hill," by Harris and Kennerly. "I Still Miss Someone" is an archetypal Carter Family-style ballad by Johnny and Roy Cash.

And, of course, she can sing; her strong yet delicate voice, dry as the driest white wine, pours into each of these songs with firm but gentle grace, warming and cooling at once. It's seldom been observed, but country music is a music of restraint, indirection, understatement, and humor of great subtlety; to hear Emmylou Harris give herself fully to these songs while retaining her emotional integrity is to hear a creative tension serving the tragic sensibility—not sentimentality—that infuses the art of the best country singers.

The impeccable arrangements are somewhat coldly recorded; CD and LP are close in sound, though the CD's a tad more dry and cold. The LP's soundstaging and stereo separation seem superior; the CD seems slightly, muddily mono'd.

As far as I'm concerned, Emmylou can keep making records like this till the cows come home, as long as there's the occasional all-acoustic *Roses in the Snow* or *Angel Band*. Recommended.

—Richard Lehnert

### PINK FLOYD: *Delicate Sound of Thunder*

Columbia P2C 44484 (2 LPs), C2K 44484 (2 CDs). Buford Jones, eng.; David Gilmour, prod. D/AAD (CD), D/ADA (LP). TT: 104:18

From this live recording pours the essence of the Seventies: loud, vulgar, excessive, theatrical rock; the ostinato of synthesized decibels, cannabis you can almost smell, smoke 'n light effects you can almost see, all combining to cast their spell of insensibility over the receptive White (whether UK or US doesn't matter) audience, those beings made cynical by Water-

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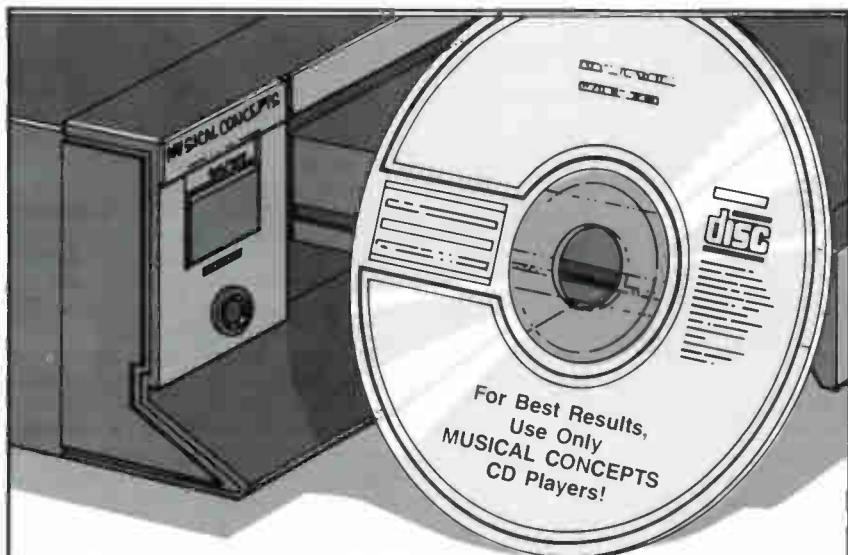


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gate, the UB-40 form, and the expectation of having to risk their necks in Vietnam or Ulster or wherever. . .

But wait a minute: this is not 1974. The recording was made during the reorganized Pink Floyd's tour last summer. And, if the kids I've seen wearing tour T-shirts are any indicators, the attendees are not all 30-year-old burnout cases reliving (or imagining) adolescent indiscretions committed under the influence of *Dark Side of the Moon*. I mean, are the Seventies something to get nostalgic about already? I don't think so, and I grew up then.

On the subject of nostalgia: sometimes here it's dumb-innocent-predictable, as when the band plays all the solos just like on the albums, a condition demanded by their constituency much as my Dad demanded that Tex Benecke play his tenor just like on the record, though it had been decades since Glenn Miller fed the fishies in the Channel. Sometimes, though, nostalgia can be the most dangerous of visceral responses. As I listened to the cramped sound of the first CD, peering into a dim and narrow tunnel of aural image, hearing the audience swaying and singing along to "Shine On You Crazy Diamond," I was reminded of nothing so much as a vision of a bunch of old German men seated before an antique Victrola, listening to Furtwängler perform Bruckner. Before you mail in those outraged nastygrams, please note that I'm writing here of *nature* of experience, not *quality*; and that listening to Pink Floyd has always been mostly a shared racial experience, the exigencies of consumerism having circumscribed for some the possibility for rapture to that which can be achieved in a hockey rink with a little help from technology: merely substitute a joint for the Schnapps, Sake, Yage, or your drug of choice. Now *that's* scary.

At least the recaps from *Dark Side*, *Wish You Were Here*, and *The Wall* get the hairs to rise. The first disc is almost completely devoted to material from 1987's *Momentary Lapse of Reason*, really feeble music, and more proof that Rock Hero David Gilmour is just not keen enough to go it alone without Roger Waters, even if Waters's lyrics do frequently remind us that life can be solitary, poor, brutish, and short.

Sound on LP is better than I had expected from a live production: fairly rich in tone, and good impact from drums and bass especially. (Curiously, the bass and drum tracks were the only ones recorded in analog. They sound slightly disembodied from, and I think subjectively superior to, the other voices.) Soundstage is broad but generalized, pinpoint imaging not to be expected from a multimiked live feed. Thanks to reader J.A. Fox for letting me know that there are still times when it's better to get

a digital LP than its sibling CD; it's the case here, the CD being uncommendable because tonally dull and unidimensional.

One technical curiosity (or perhaps more Conklin phantasmagoria): I have a hard time sensing the perspective of this recording, especially the position of the audience (the noise of which is considerably diminished by the engineers). When I switch absolute polarity, the audience moves from before the band to behind. Could it be that a figure-eight microphone was placed between audience and band, plus-lobe pointing one way, minus-lobe the other? Am I crazy, John? —Kevin Conklin

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**LOU REED: *New York***

Sire 9 25829-1 (LP), -2 (CD). Reed, Jeffrey Lesser, Fred Maher, Mike Rathke, Victor Deyglio (asst.), engs.; Reed, Maher, prods. AAA/AAD. TT: 58:00

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When Bruce Springsteen left New Jersey to look for America, he wrote *Nebraska*, an album of personal vision and arguably his strongest to date. The same is true of that other New Jersey householder Lou Reed, even though he just looked back across the Hudson River to the slums and salons of his old stomping ground, Manhattan. "It all happened here first," he says, delineating New York's primal brew of pain and sleazy beauty, the violence, dirt, and fragile relationships, aesthetics and philosophy which—incredibly—breed the early days of hope.

"You need a busload of faith to get by," sings Lou, sounding like a regular at Al-Anon, but something, maybe fortysomething, has happened to Reed. Oh yes, he will be enraged forever, but he's harnessed the energy of despair and turned it into political awareness. "I had not thought to turn again," writes T.S. Eliot, but Reed seems to have gone through some sort of epiphany, sensing that hate turned inward leads to narcissistic early death on the floors of the Chelsea Hotel. Turned out, it fuels social activism in the service of a better world, both for his Great American Whale (a sort of Johnny Applesseed nature totem) and the endless generations trapped in emotional impoverishment ("The truth is, they're happier when they're in pain. . . that's why they got married." —"Endless Cycle"). Yes, it's strange to hear Lou Reed grapple with the big issues, kicking and screaming and quarreling with himself, his lover ("Sick of You"), Jesse Jackson ("Good Evening Waldheim"). But this is a work of coming to terms. "Pick your battles and then fight like hell," he seems to say: "This is no time to not know who you are. It won't come back this way again" ("There Is No Time"). At the same time, he's making peace. "Halloween Parade" is a brave, genuine, and touching acknowledgement, a

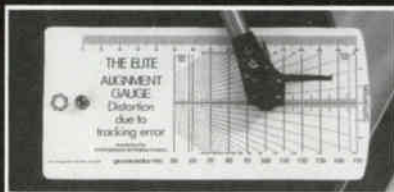
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tribute to the fellow travelers in a New York lifestyle he helped define.

Still, *New York* has flaws. Reed is too much the well-educated suburban boy to give an accurate voice to the Hispanic malisimo of "Romeo and Juliet" and "Dirty Boulevard." It's only one-time Belmont Dion DiMucci's soaring harmony vocal that lifts "Dirty Boulevard" off a made-for-TV screen set of Flatbush Avenue. "Strawman" is a dangerous rant against public hypocrisy from the man who nailed U2's Bono while shilling for Honda, and the semi-obligatory Vietnam Vet lyric ("Xmas in February") is maudlin.

But this work plays like the book or movie it's meant to be—"listen in one sitting," the cover instructs—and rewards with new takes on each new spin. For instance, contemplate Lou Reed contemplating fatherhood ("Beginning of a Great Adventure"). Lines like "It might be fun to have a kid I could kick around, a little me to fill up with my thoughts" will give a child psychologist bad dreams. But in the end, you realize America needs the creative, disturbed, and disturbing sons and daughters of Lou Reed far more than the more unfortunate offspring of Nixon, Reagan, and Bush. *New York* is so much a mirror of Lou Reed's mind that it might as well have been called "Cleveland," if that's where he were, but taken on the level of another soul's journey toward maturity, it's an

emblem of us all.

The recording demonstrates just how good an old analog chain can be. "This much vision was something to see," says Media Sound engineer Victor Deyglio, crediting Reed's tireless efforts to set up a natural sound. On LP and CD that sound is warm, spacious, gritty, and full of depth—when a rimshot cracks, check your glassware. On CD the top is clean but not brittle, entirely without any digital "stairstep." In part that warm sound results from being recorded on an old Neve 8068 console and Studer A-800 Mk.III tape machines—"the Dodge Chargers of studio gear," quips Deyglio. "You can drive them hard without really driving them."

*New York* was made with little processing but plenty of nice touches, such as miking guitarists' pick hands to get attack and taking the sound of a 6-string fretless bass direct and through an old (*old*—1968) Ampeg B15 amp. Digiphobes should note *New York* boasts just one sample (a metronome on "Endless Cycle": spot the "drummer's joke," a shifting "tick") and one synth (the eponymous whale). Test masters monitored the progress of the mix and nailed the bottom: the result is a sound that's simple, live, natural, easy—Lou and the guys amping up at your house. "Getting it to sound easy," says Deyglio. "That was hard."

—Beth Jacques

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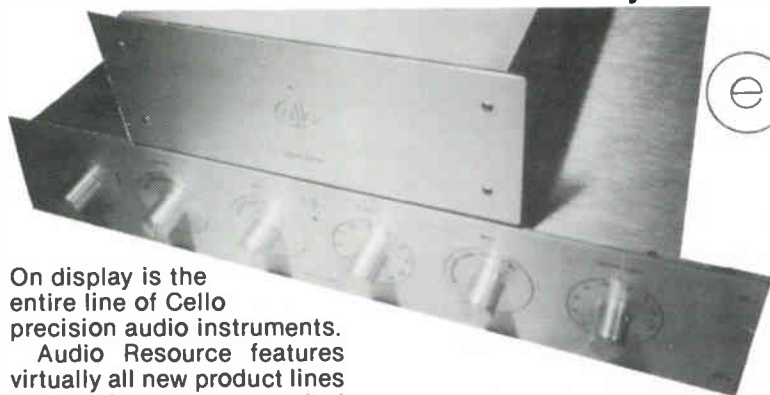
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# MANUFACTURERS' COMMENTS

## Great American Sound/Sumo

We received a copy of Andy Hefley's letter regarding his noninvolvement in the resurrected Great American Sound. We take this opportunity to confirm that he is not, nor frankly was he asked to be, part of the current group.

I was president of GAS when its doors were closed in 1980. I was also an owner and one of the company founders. Together with Adam Zaremba—like me an owner, founder, and personal guarantor of the company bank loan—we paid off the entire bank liability (personally) after foreclosure. We protected the good name and reputation of GAS, as best we could, by saving the company from bankruptcy. Subsequently, we also supplied parts, provided service information, and lent our assistance to those around the world who needed help in servicing GAS products.

It is Adam and I, as two of the original four GAS founders, vice president and president respectively at the time of demise, owners, and protectors of the spirit, who have reached an agreement with Sumo and its parent, Califone, for GAS. We also pledge our continued involvement in the company, both in design and day-to-day operation.

It is to Sumo's and Califone's credit that immediately after an agreement had been reached in principle, they began setting up factory-authorized service centers and putting in motion support mechanisms for current GAS owners. So, no, Andy Hefley is not involved; but Great American Sound is nonetheless proud to announce its return, and we look forward to good things in the future.

**Ed Miller**, President  
Great American Sound

## VTL again

Editor:

Again, our thanks for the reply space, though we're not sure that "hate mail" should be dignified with a response—but it surely fills popular pages at the lowest writing-fee possible.

Now that we're "doing our bit for the cause," may we please reply randomly?

1) Starting with JA's opening comment re. "poor service": Well, Mr. Belterri did *not*

receive "poor service"; he received *gold-star* service but was not disposed to be pleased by it. His letter sought no remedy, which was why we contended it was irresponsibly published in the first place: "hate mail," not so pure and very simple, it engenders letters like—

2) Mr. Bergman's—*another* letter that did not merit publication—but then, clearly, *Stereophile* does not know the difference between thoughtlessly damaging and constructive criticism.

Mr. Bergman, unhampered by knowledge and unsullied by personal experience with us, nonetheless voices his opinion—"from what I've heard," etc.—and *you* coolly give him space to gossip about what he has "heard"! Good reporting, eh? Think about it.

3) Mr. Michael Allen Fox, who *knous* about responsible journalism, tells it to you straight out. (Mark you, we *do* admire your willingness to stand corrected; please see closing paragraph.)

4) Mr. Seth Godin gets it right in the fewest, and correctly used, words when he questions whether VTL "deserves to be libeled. . .?"

5) From Mr. Kevin Hayes, who writes the informative, researched, and interesting kind of letter your columns *should* contain, rather than the scuttlebutt scandals you seem to prefer. . .

In closing, we have a deal to offer *Stereophile*: We at VTL have already made a conscious effort to improve our 'phone relations by adding *Shirley* to our staff (and, as you by now know, we *do* stand by our lifetime guarantee). So why don't you, *Stereophile*, make a conscious effort at being the *great* journal you so nearly are and so easily could be? Shake hands, Mr. Archibald.

**David Manley**  
Vacuum Tube Logic of America, Inc.  
*Just to respond on one point raised by Mr. Manley, I did note in this month's "Letters" column that Mr. Bergman was repeating hearsay but that I decided to publish all the letters received on this topic to avoid criticism on the grounds of censorship.* —JA

## Lazarus Cascade Deluxe preamplifier

Editor:

I would like to thank Dick Olsher for his opin-



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ion on the Lazarus Cascade Deluxe preamplifier. I respect Dick's opinion and grant him every right to have it. I am also impressed by how firmly LA stands behind his reviewers. In all regards, *Stereophile* has been fully professional.

As DO felt that our soundstaging, dynamic shadings, lack of congestion in complex passages, and detailing were all excellent, I have no additional comment to make here.

Aside from "minor irritations," the only really substantial negative I see in this review regards tonal balance. DO finds the preamp to have a significantly bright and "zippy" character. JA, in his postscript, measures the RIAA response and finds the preamp to rise both in the bass and treble, with the lowest point in the response curve lying at 1kHz. He feels that these things "just shouldn't happen in a 1989-vintage, \$1200 preamplifier."

I want to point out that this is not due to "shoddy design" or to carelessness. This was a deliberate liberty—*Sacrilege!*—taken with the holy RIAA curve.

I have always maintained that audio equipment is for the purpose of experiencing music *through*, rather than for evaluating the usefulness of one's test equipment. When the Deluxe was in its pre-production test run, I built several units with standard RIAA curves (actually slightly more accurate than the \$650 Lazarus Cascade Basic, which is quite accurate). I also built several units with the modified curve. Eight different audiophiles (three were dealers of mine) were given samples of each and asked which they preferred. All except one clearly felt that the sacrilegious unit sounded more alive, and felt it brought the listener closer to the musical event recorded on the record. None called it "bright," although one person who felt the standard RIAA unit was more "accurate"-sounding, found it to lack a certain feeling of "involvement," and far preferred the modified unit.

In reading Dick's review, I find that while he disapproved of the rising high end, he complimented me *strongly* on the bass. This variation from the correct RIAA curve he *liked*.

When the RIAA curve is given in a textbook, they are talking frequency domain only. The frequency domain has been shown by many speaker designers to be less important than the time domain. Admittedly, if we knew *all* the factors involved, and could accurately measure

them, I would feel different. I do measure these things. But I still adhere to the empirical approach, letting *ears* do the final evaluation.

I gave the matter considerable thought when deciding whether or not to deviate from the textbook RIAA. Maybe I *was* wrong. Maybe I will still have to eat crow on this. But that's what I did. There are a fair number of these units out there with some very happy customers. I feel that for *this* preamplifier, the modified curve is the right one.

I will send any Cascade Deluxe owner the few parts to change *free*, should they wish to experiment.

Final notes: The low line-voltage auto mute is a *feature*. It prevents speaker-damaging pulses from getting through should the owner's line voltage dip too low. Current factory setting is at 105V AC in the US. The preamp can be configured properly from 90V AC to 250V AC for other countries, or as needed. The LED is dim because I do much listening in a darkened room, and a bright LED is annoying.

**Greg Miller**, Founder, President, Designer, etc.  
Lazarus Electronics

## Snell Type C-II loudspeaker

Editor:

I would like to thank Tom Norton for a thorough, exhaustive review of the Snell Type C-II loudspeakers. He praised their "excellent soundstaging, providing a dramatic sense of the performing space," "the spaciousness here was stunning. . . ." and went on to say that "the mid-range of the C-II was notable for its superior detailing and lack of obvious colorations. . . the reflex-loaded C-II simply refuses to sound fat or underdamped." However, Mr. Norton did feel that the C-II was a bit bright.

We designed the C-II using the most advanced facilities and techniques in the world, and substantiated the results with extensive objective (double-blind) listening tests. In other words, we have a great deal of confidence in the correctness of the C-II's high-frequency balance. Further, it has always been Snell's policy to individually "tweak" each loudspeaker by adjusting its crossover's component values to assure that each speaker is virtually identical to the original prototype. This results in production loudspeakers that can be used as a tool to detect conditions such as bright recordings, excessively reflective rooms, or peaky cartridges.

TJN's review demonstrates, however, that

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even the most qualified of reviewers can either be subject to any of these situations, or may simply have personal tastes which dictate a softer-than-neutral high end. Having occasionally run into these circumstances at our retailers, we must assume that they exist to varying degrees in listeners' homes. We have therefore been working on a solution. To this end, we will have changed C-II production by the time this review appears in print to incorporate a continuously variable high-frequency control. We will continue to carefully calibrate each production speaker, and the accurate setting will be unambiguously marked. This will allow the user to compensate for less-than-ideal acoustics or source material, but to retain the ability to use the speaker as a neutral transducer when desired.

If any current owners of Snell Type C-II loudspeakers wish to have their speakers updated to include this control, they should contact our factory at (508) 373-6114. We would be happy to send C-IIs with level controls either to Tom or to any other of *Stereophile's* reviewers for further comments.

**Kevin Voecks**  
Snell Acoustics

## Mitek ZSE-380 loudspeaker

Editor:

Thank you for the opportunity to comment on Thomas J. Norton's review of the ZSE-380 loudspeaker system.

We have retooled the Controller's rear-panel flange to now accept a variety of high-quality connectors with outside barrel diameters up to 0.625". In addition, the High-Frequency Module's input terminal assembly has been redesigned to eliminate the intermittent connections observed in some early production units.

We fully agree with Tom's concern that strong rear radiation must be dealt with. It is precisely this concern that led to the development of the higher-mass moving-coil transducer employed in the Low-Frequency Module. The acoustic output impedance of this dynamic transducer is many hundred times lower than dipole transducers using "thin-film" diaphragms. This results in substantial lowering of the "critical placement" concerns faced by those designs.

Regarding the bass extension: During an initial production run we inadvertently released

eight Controllers with incorrect low-frequency integrator-stage values, one unit of which was sent for review. This stage is directly responsible for low-frequency extension, subsonic attenuation, and Bass Boundary Compensation. In the case of the reviewer's original Controller (which has since been replaced), nearly one octave of bass would have been missing, as sonic impressions and electrical measurements confirmed. Without proper signal contouring as the Controller was designed to provide, there would be a very pronounced spectral "up shift" as a function of the missing bass weight. This, in part, would also account for the lower highs being perceived as overemphasized.

On the subject of excursion, the low-frequency transducer used in the ZSE-380 was optimized for constant-velocity operation, and specifically designed to meet the large signal-excursion requirements attendant on low-frequency dipole operation. This allows the ZSE-380 to comfortably reproduce high-level low-frequency program material with dynamic impact, clarity and control. But not without a properly functioning Controller.

We apologize for this "bass-less" error, and ask that the product's attributes in the above areas be reassessed.

During the development of the High-Frequency Module, many transducer types and radiation patterns were evaluated for sonic accuracy. It was discovered that dipole operation at higher frequencies was more often a drawback than a benefit. This was in spite of a dipole's operation offering the potential of fewer stored energy problems (since no enclosure is used). What was found that the lighter-weight structural frameworks used in dipole treble transducers could not meet the Inert Sound Source criteria (see *ZSE Technical Design Summary*) and added substantial levels of coloration to the sound. Also, the rear sound radiation from a dipole treble transducer increases the room's reverberant field and makes the perceived music more dependent on the room.

The integration of a complementary moving-coil device, configured as a monopole treble transducer, was chosen to form an elegant and simple two-element design. This two-way design approach was selected to assure minimum driver interaction and fewest off-axis performance anomalies. This configuration

allowed us to limit the ZSE-380's height to under three feet, both for practical, aesthetic, and functional reasons, as we felt a well-executed smaller design would have greater acceptance and universal appeal than a much larger system.

Technically, this format allowed further reductions of treble-dominant room reverberation, as it permitted locating the treble sound-source as close to ear level as possible for a seated listener. Keeping this reverberant field to as low a level as possible increases the clarity, detail, and focus of the perceived sound. Likewise, it keeps the soundfield well-balanced tonally whereas a higher position would over-emphasize the treble balance, and again cause the speakers to be more room-dependent. We believe the resultant design maintains the best of both worlds, reasonable imaging height and superb tonality and focus.

We invite *Stereophile* to reevaluate the ZSE-380 System as we are confident many areas of concern have been addressed. Thank you.

**Robert Dizack, Rod Boyer**  
The Mitek Group

## Classic Audio CA 260 amplifier

Editor:

Thank you *Stereophile* for reviewing our new product. We appreciate the feedback from such a respected source.

The first model reviewed is no longer available. Classic Audio has updated all CA 260s in the field for free.

Our design philosophy is to develop the most transparent and neutral sound possible to allow the listener to enjoy the music and not have his attention drawn to the amplifier. This approach was developed from listening tests using highly modified Futterman OTLs, Quad ESL-63s, and NYAL's NCP2 preamplifier, also modified toward neutrality and lower noise. Our search for low-level detail and resolution (the goodies that happen under the surface of the music) has resulted in our highly praised (by your readers, *Stereophile* February 1989, p.27) Moscode modifications. For example, the individual notes become more apparent in tightly voiced piano chords, and in a vocal chorus, the voices become more distinct.

Classic Audio found that the right combination of tubes and FETs yields a better result than strictly either approach. The whole industry is leaning in this direction.

We have applied our findings and added additional gain and negative feedback to yield a much more focused and solid presentation and move the sound more toward the "tube lover's" camp. Since the Classic Audio CA 260 amplifier is built with the world's last supply of real McIntosh output transformers, we actually shifted our philosophy to accentuate the positive aspects of these vintage, military-grade pieces of audio history. Using the larger 6550 output tube more conservatively in our 50W offering should also result in much greater tube life than the smaller EL34s offered by other manufacturers. In this case, we feel that we have succeeded very well in meeting the standards of low maintenance, three-dimensionality, depth, soundstaging, and an appropriate blend of neutrality and tube romanticism. This current production is limited to 125 with the authentic McIntosh transformer. Service, however, will always be available.

We feel that after J. Gordon Holt's comments about equipment submitted for review in Vol.11 No.8, *Stereophile* should have mentioned the fact that the two Classic Audio CA 260s worked first time out of the box, that Classic Audio includes two screwdrivers for set-up (nice ones too), and that there is extensive documentation in the owner's manual, complete with a table of contents.

Thank you to Mr. Olsher for his constructive critique and to all our friends for the impetus to keep going into what at times looked like the impossible.

**George Kaye**, President  
Classic Audio Ltd.

## Sony DT-10 Discman

Editor:

Although we appreciate Bill Sommerwerck's thorough review of the Sony DT-10 Discman, we would be remiss if we failed to clarify a few important points for your readers.

The Sony DT-10, while still available at some retail outlets, is actually a now-discontinued Discman model that was first introduced in 1987. Given our constant improvements regarding the state of the art in digital audio technology, perhaps your readers should also consider evaluating one of our newer Discman players like the D-9 or D-25, both of which reflect further refinements in both circuitry and design. (The DT-10 evaluated is actually most similar, circuitry-wise, to the earlier D-10 Discman.)

In addition, the BP-200 battery that Bill cited in his report is no longer available as an add-on accessory option, thus limiting the DT-10's playback time to about four hours on a single charge. **Stephen Fisher**, Product Manager  
Sony General Audio Products

## AudioPrism 7500 FM antenna

Editor:

The AudioPrism 7500 FM antenna was engineered to deliver optimal performance in the most havoc-raising environment possible—a building's interior. Interior wiring and metallic objects impede and reflect signals in various ways which affect all antennas differently. As Mr. Scott pointed out, FM signals can arrive at different angles depending upon antenna design and placement.

We concur with Mr. Scott's observations about the problems inherent in active antennas. We tested various scaled-down, electrically amplified, active antennas and found design anomalies which exacerbated interior interference problems. These include front-end overload, intermodulation, distortion, and poor decoupling of the power line and transmission cable from the antenna to the tuner's backside "F" connector.

We ultimately selected a full half-wavelength, vertical, passive antenna with gain developed naturally, not electrically. In the final analysis, however, the only true test for any FM antenna is to evaluate it in the exact environment where it will be used. **Sam I. Lewis**, President  
RF Limited

## Snell erratum

Editor:

Thank you for including us in your CES Index on p.97 of the March 1989 issue. However, the wrong address was listed for Snell. The correct address is 143 Essex Street, Haverhill, MA 01830. Voice telephone is (508) 373-6114, FAX is (508) 373-6172. Thank you for your attention.

**Kevin Voecks**  
Snell Acoustics, Inc.

## The Mod Squad Duet

Editor:

After all those complaints from readers about high prices, here is your chance to tell them about something that costs *less* than they thought.

In your report in March from the WCES, you

listed the price of our Duet chassis upgrade kit as \$595. I am happy to say that it actually sells for \$295! Such a deal! All the other information published about this new product, which allows Phono Drive/Line Drive owners to house their units in a single chassis, was correct.

**Joyce Dudley Fleming**, President  
The Mod Squad

## Lyle Cartridges

Editor:

In regard to TJN's cartridge chronicle in the February and March issues, we are surprised to find that we were not included in the manufacturer/distributor address listing at the conclusion of his article, for the Audio-Technica AT-OC9 moving-coil cartridge. We had already written you in the Dec. '88 issue regarding this matter. If, as stated on p.101 of your February issue, "Lyle Cartridges also stock it, I believe," why did he not follow this up with a confirming phone call?

His additional comments on this cartridge on p.75 are not 100% accurate. Our latest catalog shows a discount of 30% off the list price. This is not even close to the \$900 price of our competitors.

**Eric LeWinter**, VP  
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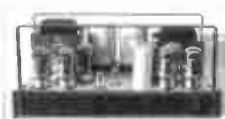
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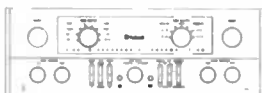
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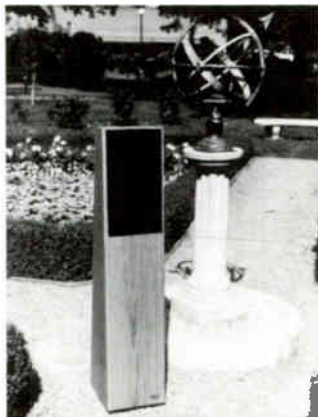
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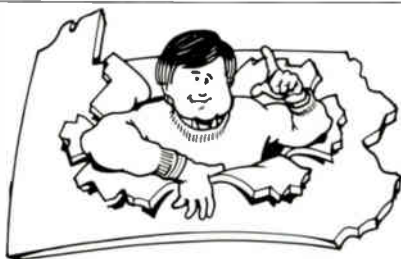
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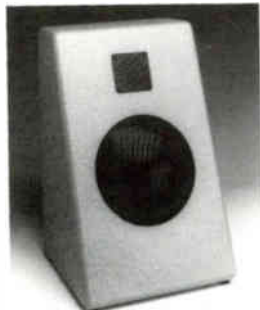
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# THE FINAL WORD

## Get 'em While They're Hot— Before They're Not

We are living in the Golden Age of the Used LP, folks. Mistakenly, in my opinion, the non-audiophile music lovers of this country are divesting themselves of their LP collections at a rapid rate. Though this reflects the tragic demise of vinyl as a viable retail commodity, it's a bonanza for those of us who continue to love LPs.

I've found that garage sales, used book stores, and used furniture stores are providing a bonanza of old records. It's quite different from shopping for new records. The biggest difference, of course, is the diversity of selection. There are artists you've never heard of, as well as those you have heard of but would never see in a store these days. Even better, the prices are so cheap you can buy things you might never otherwise try. Right now, for instance, I'm listening to a mono RCA of scenes from *Salome* and *Elektra* (LM-6047)—Fritz Reiner and the CSO, no less, with Paul Schoeffler and Frances Yeend. The soundstage is a bit limited, but the singing and orchestral work are impassioned and tension-filled. Even more important, these are works I might have never considered buying at modern prices. But at \$2.66 (two LPs), there's essentially no risk! That's what I pay to rent a videotape.

Over the last couple of months I've found two copies of *South Pacific*, a pristine movie track of *Sound of Music*, highlights of *Tosca* with Renata Tebaldi, a copy of the first Odetta album I ever owned (but had since lost)—the list goes on and on. One day I came away with 34 discs for the price of three new CDs; even disregarding fidelity, musically there's just no comparison.

There *are* problems, of course. Many of the records you see are scratched and abused beyond even my tolerance limits. Even worse, pristine-looking records tend to have significant damage in highly modulated grooves where way-less-than-state-of-the-art cartridges have rattled repeatedly back and forth.

My technique was to buy a Nitty-Gritty Mini-Pro II, a lot of good record sleeves, and just pick up whatever looks good. There are some disappointments, but I have to tell you, there's musical excitement in those grooves you have a helluva hard time finding in modern recordings. It feels to me that the musicians let it all

hang out to a much greater degree. These are records that simply don't allow you to wander around the house listening to them as background; you return riveted to your best listening seat.

## Mary E. Holt

On Palm Sunday, March 19, Mary E. Holt, the wife of J. Gordon, died after a long bout with cancer. She is survived by Gordon, daughter Alicia, and son Charles, as well as sister Catherine Jane Norton. A memorial service was held on March 22, and Polly, as she was known to one and all, was buried at the Foothills Garden of Memory facing Long's Peak, just north of Longmont, Colorado.

Born Mary Elizabeth Norton, Polly grew up in New York City, as the member of an illustrious Harvard family (her grandfather was Charles Eliot Norton, after whom is named Harvard's best-known series of visiting lecturers). Educated at Radcliffe, Polly launched into a career of library archiving at the Winterthur Museum (of Decorative Art) in Wilmington, which she continued following her marriage to J. Gordon Holt in 1969. Her career continued in Santa Fe at the Wheelwright Museum of the American Indian, until her departure in 1983 for Boulder, Colorado.

Polly was known to long-time readers of *Stereophile* as Margaret Graham, in which guise she frequently served as the magazine's sole record reviewer, and as "Circulation Mgr., Assistant Editor, Spouse & Drudge" (JGH was himself, at that time, "Editor, Publisher, Staff Writer, Chief Tester & Drudge"). Her efforts in record reviewing and subscription fulfillment were unstinting and, in the latter case, without benefit of the computers we now use. She was an accomplished pianist; using, initially, her upright Baldwin, and, later, her old 5½ Steinway grand, Polly provided both musically insightful playing and an immediate reference to the sound of live music at the Holt household.

Polly was a loyal companion to our Founder and Chief Tester; he, I, her surviving family, and a good portion of the audio industry will miss her deeply.

Larry Archibald

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VOL 8, NO. 8, JAN '86



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