

FEBRUARY 1989

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Stereophile

SWEDEN'S AIRTANGENT TONEARM

KLYNE SK-6 PREAMPLIFIER
QUAD US MONITOR
MIDPRICE PICKUPS
BUDGET LOUDSPEAKERS
ARCAM DIGITAL PROCESSOR
ROBIN MARSHALL INTERVIEW



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VOL. 12 NO. 2

COMING ATTRACTIONS

I'm sure few would disagree if I said that the latest generation of CD players appear to resolve more information off disc than can currently be put there by digital recorders. Does this result in better sound? Lewis Lipnick has been living with Mike Moffat's Theta DSPre digital processor/preamplifier while I have been auditioning the latest version of the Accuphase two-box player; our reports answering that question will appear in the March issue of *Stereophile*. Meanwhile, Sam Tellig, the infamous Audio Cheapskate, returns to these pages in a new guise. The quest for the best sound having led him into uncharted waters in recent months—witness his rave over the horrendously priced Versa Dynamics 2.0 turntable—his column has been renamed "The Audio *Anarchist*." Sam also has been listening to CD players, in his case less expensive but nevertheless high-tech models from Adcom, Magnavox, Onkyo, and Yamaha.

Other equipment reports in the March issue will include Tom Norton on inexpensive pickup cartridges, Don Scott on recent FM tuners, and Dick Olsher on power amplifiers from Audire and Electrocompaniet. We will also publish an index to every review and article that appeared in *Stereophile* in 1988. (We

have a full stock of back issues available for those who missed any of Volume XI; we also have a complete, if black-and-white, reprint available of one of our most popular issues, Vol.9 No.7, which carried reviews of the Martin-Logan CLS, Apogee Caliper, and KEF R107 loudspeakers.)

On the music side, in addition to our regular record reviews Christopher Breunig will look at Shostakovich's Symphony 10 on record. Also in the works are an interview with conductor Riccardo Chailly, a survey of recent issues of Kurt Weill's music, and reviews of two new Beethoven symphony cycles.

Finally, I am pleased to announce that three of *Stereophile's* writing team were promoted on January 1, 1989: In recognition of the consistency of their value judgments, their dependability as writers, and their long-term loyalty to the magazine (all three are also extremely stimulating company), Tom Norton, Dick Olsher, and Sam Tellig are *Stereophile's* first Senior Contributing Editors. My congratulations to all three.



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AS WE SEE IT

"When Things
Go Wrong..."



It Hurts Me Too"

John Atkinson

I am writing this copy on a venerable Radio Shack TRS-100 portable computer while flying via TWA from St. Louis to Albuquerque, the very fact of doing so having reminded me of what I wanted to write about in this month's column: hardware reliability. J. Gordon Holt touched on this subject in last June's "As We See It," but I felt it worth readdressing in light of recent events.

As a writer and editor, I was relatively quick to appreciate the advantages offered by word processors over typewriters, and have built up quite a body of experience over the last nine years with a variety of computers, disc drives, printers, and modems. With the exception of finger problems and software bugs—which in themselves can drive a man to strong liquor—I have had *no* reliability problems with any of that hardware despite constant use and, with the portables I use, a considerable degree of travel abuse. Yet when I look back over the magazine's experience with components sent for review, high-end components appear to have an appalling track record in comparison

with computer hardware, despite their similarly complicated electronic nature.

For example, in just the last 12 months or so, we have had:¹

An amplifier supplied for review with its output transistors wrongly wired. Although it appeared to be working correctly, the sound was disappointingly bad. Only after the review sample was returned to the manufacturer did the reason for its poor performance become apparent.

A tube power amplifier that broke while driving Apogee Calipers, which are not too extreme a load, in my opinion. When fixed by the manufacturer, the same amplifier featured a significant level of hum which couldn't be eradicated.

A manufacturer who had to supply us with three samples of a preamplifier before we had one that worked correctly.

¹ It would be unfair to name names, as all the manufacturers concerned have already had their problems aired in print. A careful reading of the last 14 or 15 issues of the magazine, however, will reveal who the featured manufacturers are.

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A tube preamplifier that arrived dead in the box. The culprit was a blown fuse—before it was plugged into a *Stereophile* wall socket.

A power amplifier that could not be auditioned at all due to the fact that the circuit breaker in the house wiring cut out every time it was turned on.

A very expensive hybrid power amplifier, of which four samples failed in a row (after the favorable review was written, of course).

Another very expensive hybrid power amplifier that had persistent tube failure.

A tube preamplifier that went unstable at low frequencies, leading to the destruction of a power amplifier.

More than a few CD players based on Magnavox chassis that had faulty or intermittently working transports.

A portable CD player with a laser that refused to follow the pit spiral.

One CD player that had its de-emphasis switched in all the time whether the discs needed it or not.

A digital decoder that underwent a series of modifications during the review process to remove a weakness concerning the pickup of RF interference.

A handful of box loudspeakers that arrived with only one of the pair in working order. One model had one of the pair's drive-units wired out of phase with the other.

Four box loudspeakers that self-destructed during not-very-rigorous testing.

A pair of dynamic loudspeakers from a complete production batch that featured woofers totally out of specification, resulting in a redesign during the review period.

An electrostatic loudspeaker that destroyed two of the amplifiers with which it was used.

A speaker manufacturer who recalled a review pair of loudspeakers before we had a chance to listen to them on the grounds that he had updated the design. The replacement pair were likewise immediately recalled and replaced with a third pair. Of this pair, one speaker was dead out of the box and the drive-unit phasing appeared to be different in each speaker.

An expensive high-end loudspeaker whose manufacturer apparently had considerable problems in supplying two that sounded alike. A knob then fell off the control unit and the terminal posts worked themselves loose.

An active loudspeaker whose bass-amplifier

sensitivity was set so high that, even with its maximum attenuation, the level was 6–12dB too high compared with the midband.

A subwoofer that had its input and output crossover connections reversed, resulting in a response, when wired up "correctly," that didn't extend any lower in the bass than an LS3/5a.

Another subwoofer which also extended no lower in frequency than a small monitor when measured, whereupon the manufacturer asked for the review to be killed on the grounds that he hadn't supplied it specifically for review; and in any case, the subwoofer would only work correctly with his particular loudspeakers.

A tonearm whose distributor couldn't supply a working sample for a significant length of time.

A turntable with a suspended subchassis for which there was a complete lack of vibration isolation. The manufacturer "solved" this problem in subsequent production by removing the suspension altogether.

A turntable which, as supplied by the distributor, barely worked and was missing a significant amount of its accessories.

A moving-coil cartridge that arrived loose in its packaging and minus its stylus.

And in this issue's equipment reports, you will note from Martin Colloms's review of the Klyne SK-6 preamplifier that the manufacturer replaced the review sample while the review was underway. Though the SK-6 has been in production for a year or so, the first sample that we received for review was, in fact, founded upon a revised circuit board. Some time into the review process, Stan Klyne found out that the entire batch from which the review sample had been drawn sounded considerably less good than the initial production, the culprit turning out to be the revised board. He decided that they should revert to the older board and scrapped all of the bad batch, the only one to get away being Martin's review sample. Stan accordingly asked if it were possible to submit a second sample, typical both of current production and of the generation already in consumers' homes. We had no objection, and Martin finished the review, repeating the line-stage measurements (the phono board was the same in both samples) and the auditioning.

As you will see, the review findings based on the second sample were generally favorable, although Martin did have reservations about



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the phono stage's overload margin and linearity. However, while Klyne was not pleased with his findings in this area—see “Manufacturers’ Comments” in this issue—they were prepared to accept them. They were, however, extremely disturbed to find out that the review as printed would contain a significant amount of negative comment concerning the first, defective sample. As current production of the SK-6 is identical to the second, better-sounding sample, they felt that to include any mention of the first would misinform or confuse *Stereophile’s* readers: “The review is overly negative, frequently contradictory, and confusing because it refers to the first unit for too much of the time,” stated Klyne’s Janice Arnold in a letter following *Stereophile’s* sending Klyne a preliminary copy of the review.

Well, I’m afraid that that’s the breaks. As I stated in “As We See It” in December 1988, if it turns out that a review sample was faulty, we will gladly take delivery of a second, third, or even a fourth sample, but the performance of all the samples will be reported in the body of the review. To quote from December’s column, “the writers are instructed to include in their reviews *all* their experience with *all* the samples they’ve received, not just the most recent or best-functioning.”

In a sense, everything that happens during the course of a review is “on the record.” The reasoning behind our taking such a hard line is as follows: If it is possible for a *Stereophile* reviewer to receive a faulty or unrepresentative sample of a component, with all that would be at stake were the product to receive a negative review, then it is probably *more* likely for one of the magazine’s readers to do so. The magazine’s primary responsibility is to its readers. *Ergo*, quality-control problems must be reported in the review, and to make exceptions for some companies would be both inconsistent and unfair.

Against this, it could be argued that a *reviewer* is more likely to receive a defective sample than a reader, he or she often experiencing a sample from the first production run. After all, doesn’t every magazine want the very first review sample of any product? In addition, the dealer is there to act as a buffer between a manufacturer’s lack of QC and the consumer: if a company sends out products to its dealers that turn out to be defective, it gets them straight back. This is the so-called “Beta” testing where

the manufacturer relies on third-party experience to reveal problems that didn’t show up in the in-house, “Alpha” testing.

I am afraid, though, that I have little sympathy with these arguments. In my opinion, a magazine reviewer’s listening room is a singularly inappropriate Beta-test site. The reviewer represents the interests of his or her readers, not those of the manufacturers. *Not* to inform the readers of bugs and failures, perhaps substituting a private word with the appropriate manufacturer, borders on behavior nearer to that of a consultant than a reviewer.

It is also relevant to a review’s findings whether or not the manufacturer can make their products to a consistent standard. It was either Laurie Fincham of KEF or the late Spencer Hughes of Spendor—I am afraid that I can’t remember whom—who succinctly defined the skills required of a manufacturer: first, to be able to design a worthy product; second, to be able to make it consistently and reliably. Each is as important as the other, and both are relevant to the consumer, not just the first.

The other aspect of reliability concerns when a product fails in the consumer’s hands. VTL’s David Manley, in responding to a letter in this issue from a Mr. Belterri complaining about the supposedly poor treatment he has received following the failure of a VTL product, asks what exactly is *Stereophile’s* stance concerning publication of letters from readers who have had problems?

We actually receive only a small number of letters of complaint and take each one at face value. Whether I choose to publish or not depends on a number of factors, principal among which is whether we have received other letters complaining about the same manufacturer. I always allow the company complained about the right of reply. In this case, Mr. Belterri and Mr. Manley can’t both be correct in their published statements, but at least it appears that Mr. Belterri did ultimately receive his money back and VTL did find another customer for the disputed amplifiers. The moral to be drawn from this unfortunate exchange of letters, however, is that 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. Should a company act as though the customer is always right? It would be wise to do so, as far as I can see.

S

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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.

Reviews are relative!

Editor:

While doing some "house cleaning" I ran across some of my archived copies of *Stereophile*, the oldest being from the Spring of 1966. (It's 8½" x 11", remember those?) Looking through these old issues, I came across a review of the Dynaco PAT-4 in the Spring 1968 issue, which contained the following paragraph:

"With all of its tone controls and filters set to flat, and feeding any high-level input, we were simply unable to tell whether we were listening to the original 'raw' signal or the output from the PAT-4. In this respect, we cannot see how *any* preamp, present or future, could surpass the PAT-4."

My, how times change. The point of my letter is not to belittle or castigate the review or JGH, but to serve as a reminder of the age-old axiom that "everything is relative." **Gerry Brown**
St. Louis Park, MN

Description necessary?

Editor:

I am a student at the University of Illinois and have been reading *Stereophile* for over four years now, and I really enjoy what you are doing.

However, I was very disappointed by Brian Cheney's review of the "Yamaha GH1B Digital Music System" in the September 1988 issue. While the review gave a vague feeling of the overall sound of the "Music System," it never disclosed what the GH1B is! I assume it has speakers and amplifiers included, and probably a CD player ("Digital"), but what exactly is it?

Jeff Muget

Oak Park, IL

To quote from the penultimate sentence in Brian Cheney's review, "I can only recommend this system to those few who... must have a grand piano in the house." Sorry for the attempt at humor, Mr. Muget. —JA

An inconsistency?

Editor:

Stereophile is taking liberties in the ranking of certain components [in "Recommended

Components"]. The problem seems to be a continuing lack of consistency in the ratings. You rank the Goldmund Reference as being Class A in the October issue of *Stereophile*, despite your never having reviewed it in your pages.

You are, of course, entitled to do as you please with your magazine. I think it a great disservice and hypocritical that you indicate in the loudspeaker section that the WATT/WHOW system "implies" true Class A performance, but you demur from making a final recommendation based on *not* having heard it in your own surroundings. You indicated to me [in a letter] that you had heard the Goldmund Reference at a "friend's" house. How does this entitle you to give the Goldmund an "A" rating, but not the WATT/WHOW? Do you have to hear it in the same friend's house? Are Mr. Wilson's surroundings unsuitable because he is the manufacturer, or is it that you are unfamiliar with his room?

For me, it is not a matter of intense *personal* interest, although I *do* own the WATTs. It is more the *intellectual* perception that "half an audition" is acceptable to you for one item, but not for something else. It is some of these very inconsistencies that lead a person to wonder where the stringent requirements begin and end. Furthermore, to suggest an "NR" for the Goldmund, and in the same breath tell your readers not to "hold your breath" waiting for the review, is a low blow. If you can't get a sample to review, say so, and cut out this titillating *National Enquirer* stance.

Really, you have been implying this review through two "Recommended Components," with the same warning not to wait for it. Double-speak at its classic height. In other words, deliver or *shut up!* I do not doubt that the Goldmund deserves an "A" ranking; it's just that the readers would probably like to know what you *heard* when you listened to it, and you can't tell them, can you? This is keeping up with the Joneses (or *TAS*) in the matter of this component. I dislike this intensely.

Glen McLeod
San Francisco, CA

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Fundamentally, I regard "Recommended Components" as being *Stereophile's* prime store of hard buying advice. We only recommend components in this listing if we can wholeheartedly do so. The primary source for our opinions is the magazine's review section, but other experience when relevant is considered, and the intention is to give as complete a picture of each product as possible. To ignore products that we have had considerable experience of but not formally reviewed would fail those of our readers who are interested in our opinions on those products. I try to write the "Recommended Components" entries precisely enough that these cases are self-evident.

Regarding the apparent inconsistency in our treatments of the Goldmund Reference and the Wilson WATT: Despite *Stereophile* never having formally reviewed the Goldmund, Martin Colloms has had considerable experience of the product through writing a technical analysis of it for TAS. As Martin is a staff reviewer for *Stereophile*, his assessment of the product is germane; I took note of Martin's opinion, reinforced by Gordon's and my experience of the Goldmund Reference turntable in Martin's system, when deciding whether or not to recommend it in Class A. This was not a casual audition: Gordon and I spent the best part of an afternoon listening to and examining the turntable, selecting recordings we know well and acquiring hands-on experience of the product. In addition, I am intimately familiar with Martin's listening room, having taken part in both formal and informal listening tests in it since 1977.

Contrast this experience with Gordon's and mine of the WATT/WHOW system, as reported in "As We See It" last July (Vol. 11 No. 7, p. 9). Again Martin was the *Stereophile* staffer most familiar with the hardware in question, this time having formally reviewed the WATT in the magazine (Vol. 11 No. 2), the result being a Class B ranking. However, our further listening to the WATT and the WHOW was performed in a room where neither Gordon nor myself had ever done any listening; the WHOW was the prototype; Gordon and I had no hand in the choice of program; in the limited time that we had available, though the sound was stunningly lifelike, it was not possible to get any more than a provisional impression of the system's possibilities.

I would suggest, therefore, that as a matter

of responsibility, given the considerably greater degree of confidence in our opinions on the Goldmund than on the WATT/WHOW combination, we handled the difference in the recommendations of the two in "Recommended Components" correctly. I have had enough experience of the Goldmund with program of my own choice in rooms and systems that I know intimately, that I am confident of recommending it in Class A, though the ultimate recommendation will have to wait until we have one here in Santa Fe. (Unless we buy one, this is not likely to be in the near future.) With respect to the WATT, the consensus of opinion at *Stereophile*, based mainly on Martin's review, is that, considered on its own, while achieving greatness in specific areas, it departs sufficiently from neutrality that it cannot overall attain a Class A recommendation. Class B is where it belongs. With the WHOW, Gordon's and my limited experience in a room and system with which we were both unfamiliar and on program that was new to both of us and of unknown ultimate quality was nevertheless positive enough that I felt we should add conjecture in October's "Recommended Components" that the WATT/WHOW combination would achieve Class A performance. However, I would want considerably more experience on a much wider range of program before turning that conjecture into a hard and fast recommendation. —JA

An alarming amount of venom

Editor:

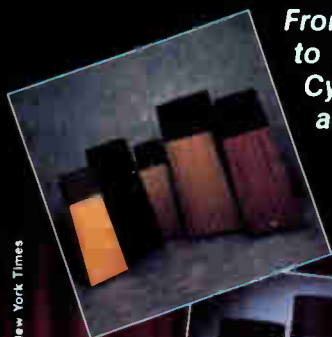
Like Mr. Deutch and Mr. Addison ("Letters," Vol. 11 No. 9), I too have noticed an increasing and alarming amount of venom in many of the entries in "Letters" over the past year. After going over back issues and re-reading some of those letters, I have come to the conclusion that many were written either to impress upon other *Stereophile* readers the writers' vast superior knowledge on various topics, or to take the opportunity to front their "world-class" audio systems for everyone to envy.

Audio is a matter of personal taste, and *Stereophile* is an excellent publication; but it is a tool, and should be used as such. It is not a target on a shooting range to be continually attacked, with cheap shots and demeaning smears, by everyone who doesn't agree with every word written between its covers. A.E. Watkins

Mechanicsburg, PA

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Stereophile Vol. 11, No. 8

"So the bottom line is quite favorable: the Walsh 5 is a full-range speaker that is quite clean and images very well." "Soundstage is another strength and joy, and at their best the 5s can set up a very palpable illusion of the original performing space." "In its present incarnation, it is one of the few dynamic speakers that a jaded electrostatic taste buds could live with." —Dick Olshen

Audio 6-88

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Stereo Review 1-88

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New York Times 3-88

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*For Those Who Care
to Listen*

What a joy!

Editor:

What a joy! Delightful reading!

My sincere thank you for printing Martin Colloms's article on the "state of the CD art" in the November issue. Mr. Colloms has done a splendid job of articulating the current state of affairs in understandable and precise form. It is unfortunate that he did not have state-of-the-art digital decoders to review for his state-of-the-art review. While the Denon and Marantz units are good, they are not at the cutting edge of technology. Perhaps he will have an opportunity to evaluate Mike Moffat's Theta Digital DS Pre and the Wadia Digital 2000 Decoding Computer. It would be most helpful to know how close these decoders come to the Goldmund Reference standard.

Steven C. Fischer, PhD
West Bloomfield, MI

He loves it

Editor:

Your publication is a credit to our great "hobby." *Stereophile* editors are not afraid to tell it as *they* see it. Very few magazines have enough intestinal fortitude (guts) to say it like it is. The fact that you will publish a manufacturer's response to a review is another big plus for the reader. It allows the reader to evaluate all of the data, then make a sound decision. Some of the companies you hit the hardest are your own advertisers! I love it.

Before closing, I would like to comment on the David Hafler Company. I own a DH100 preamp and two DH220 amplifiers. When I fired up the DH100, I noticed that it had a slightly louder noise floor than my previous preamp, a Dynaco PAT-5. I called the customer service department at Hafler, expecting them to tell me that I would have to live with the increased noise floor. The customer service representative, however, was very courteous, and put me in touch with the service center. The service center performed an IC modification to lower the noise floor on my unit *at no charge*. The David Hafler Company is a class act. I hope that this company can continue to manufacture fine products, and provide excellent customer service in the absence of Mr. Hafler. No one in the industry has been able to provide "more bang for the buck" than David Hafler.

Tom Unangst
Liverpool, NY

Is this man cheap?

Editor:

In accordance with your offer, I wish to cancel my subscription to *Stereophile* and receive a full refund.

Although I'm not one of those who think that there are no audible differences between components with identical specs, *a la Stereo Review*, *et al*, I find a very disturbing tendency among your reviewers, the Audio Cheapskate notwithstanding, to automatically discriminate against those components from the lower end of the price spectrum. Perhaps in the past, the experiences of your group were that mass-produced, "popular" components did not meet your audio criteria: yet you must acknowledge that the various electronic fields are not—the understatement of the year!—static. And yet I see no evidence of a continuing foot in the water of the so-called cheap stuff other than Sam Tellig's column. I am sure that the subject components would continue to prove inadequate, but common sense tells me that occasionally some wheat would be found among the chaff, and the perspective of your staff would be enhanced. For example, if car magazines took the attitude of *Stereophile*, then the Honda CRX-si, a delightful little car, may have never been looked at because it was too cheap! Also, the automobiles that are a legitimate step up from the Honda would be unappreciated as being run-of-the-mill compared to the Ferraris and Lamborghinis. Anyway, thanks for giving me the unprecedented chance to get an in-depth look at your magazine and get a full refund! I'm sure that my money will soon be on its way.

Richard A. Gilmore
Baltimore, MD

He took us up

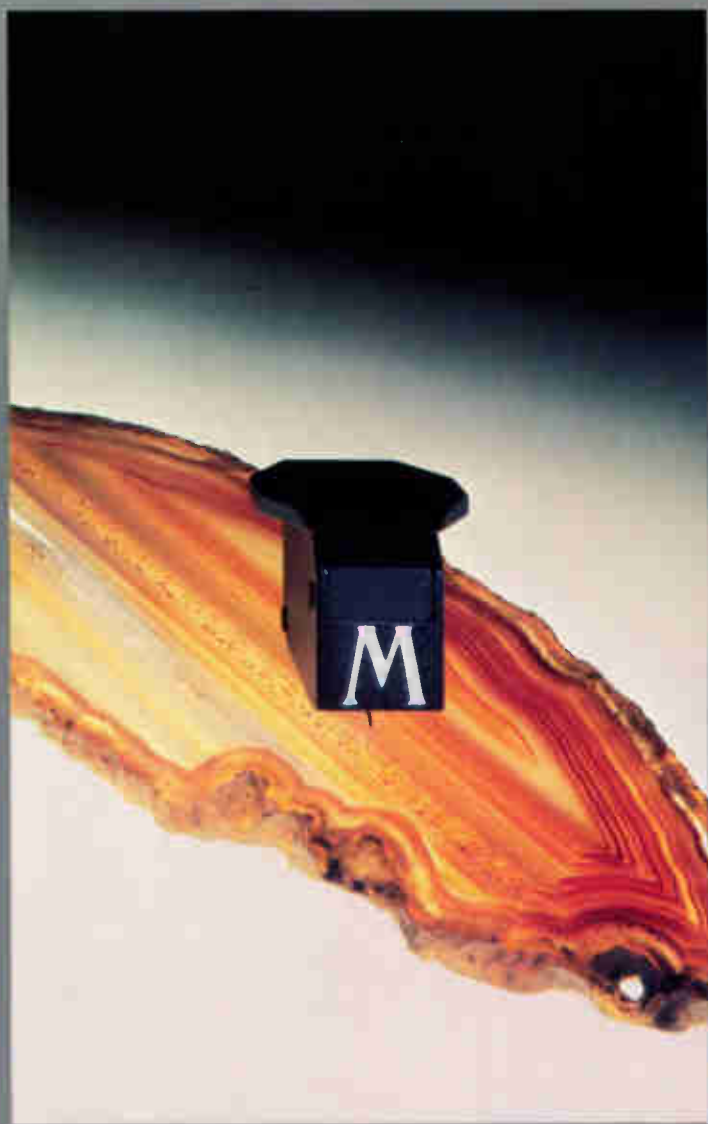
Editor:

I took you up on your offer of eight issues of *Stereophile* for a discounted price. Having received the magazines, I have been disappointed in the result.

I fail to understand your reluctance to perform *rigorous double-* or *triple-blind* product evaluations in formulating your Buyer Recommendations. Until you do, you are practicing "soft science" which is not taken seriously by learned individuals. I demand a full refund.

William E. Walsh
San Diego, CA

WHEN ONE IS NOT ENOUGH



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Regarding Mr. Gilmore's point, we do try to sample inexpensive components, witness the reviews of inexpensive preamplifiers in Vol. 11 No. 12 and the coverage of budget loudspeakers which continues in this issue. But I have to say that the equivalents of the Honda CRX-Si are rare in the extreme, most cheap equipment in my experience being cheap because it has been rigorously designed down to a price point, in the process omitting a lot of what this magazine considers essential. Of the products that have been reviewed in Stereophile, the only exceptions that readily spring to mind are the Adcom GFA-535, the B&K ST-140, and Parasound HCA800 II amplifiers, the Superphon CD Maxx Line preamplifier, the now unavailable NYAL SuperIt phono preamplifier, the NAD 1300 preamplifier, and such speakers as Magnepan's SMGa and the Spica TC-50, all of which cost less than \$500, a price which seems to represent a natural dividing line.

I advise Mr. Walsb to re-read "As We See It" in the September 1988 issue and "Industry Update" in the January 1989 issue for a discussion of why this magazine doesn't put all its eggs in the double-blind basket. But as for triple-blind testing, where presumably neither the listener, the operator, nor the person organizing the test has any knowledge concerning what is being listened to, I am positive that this will be of no use whatsoever even if differences are consistently identified. Why not? Think about it.

—JA

Absolute arguments

Editor:

After reading John Atkinson's "Absolute Values" in the September 1988 "As We See It," I found I could no longer resist the temptation to put in my two cents' worth.

Although John does his best to ridicule Daniel Shanefield's (as well as Ross Walker's, Douglas Self's, etc.) statements, I believe there is more provable truth in what Shanefield had to say than in all the hype continually propagated by the underground press and obviously believed by John. It doesn't take too much effort—along with a bit of skepticism, logic, and a few controlled tests—to seriously question much of this widely propagated hype. In fact, I believe you will find, as Mr. Shanefield, I (independently), and I'm sure many others have found, that with the present state of the art, the vast majority of the differences between amps, preamps, car-

tridges, etc., are indeed simply frequency-response differences. This is, of course, true only if you are not driving the components into overload or protection. The fact that there is little magic in most electronics components shouldn't scare the good designer, as there is still plenty of room for creativity in many areas. For example, amplifier designers still have much to do, as there is usually much difference in the sonic quality of amps in overload.

Note that I am not saying that amplifiers, etc., all sound the same. They obviously do sound different, but the reason is not very ethereal, as pointed out above: John spends a fair amount of his fury on the idea that objectivists believe that all amplifiers, etc., sound the same. I'm sure some people do believe this, but they would have to be pretty naive and close-minded. There are, of course, situations where amps, etc., do sound the same or very similar. However, I don't think that the Walkers or Mr. Shanefield or certainly myself believe that *all* of them do. I don't even think that Mr. Self, according to his articles, believes that. Rather, I suspect that most so-called objectivists believe that there are simple explanations for these differences, and that rarely are they associated with exotic components, circuit topologies, and exotic measurement techniques.

Unfortunately, making statements about what I believe to be the truth will convince very few audiophiles. I find that "dyed in the wool" subjectivists who have been through a few controlled tests that should cause them to question their "religion" seem little fazed by the experience. People will go on believing what they want to believe in spite of the truth. "Don't confuse me with the facts." One could readily say that it is the objectivists who have their facts screwed up. However, in most controlled tests trying to seek the truth with which I've been involved, the results lean heavily toward the objectivist philosophy.

An investigation by an independent source such as *Stereophile* might carry some significant weight. The search for the truth is, after all, the job of the underground press. Is that not your implicit charter, or at least what you claim it to be? I've seen this search for truth occur only on rare occasions in *Stereophile*, such as the Carver amplifier shoot-off. (Unfortunately, you did your best to nullify the results with later comments.) It's about time for the underground press to stop ridiculing the objectivists,

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become more open-minded, recognize that there may be some substance to the objectivist point of view, and begin a serious search for an understanding of the real truth. This situation reminds me so much of our slick political environment: conservatives *vs* liberals, Republicans *vs* Democrats. However, if one is reasonably open-minded and steps back from that environment, I believe they will find that neither is right and that the correct path is somewhere in the middle. In audio, it seems to be the slicks *vs* the underground, objectivists *vs* subjectivists, engineers *vs* non-engineers. The truth is, again, likely to be somewhere in between.

I personally believe that *Stereophile* has taken a definite turn for the worse in terms of believability [since John Atkinson became editor]. Fortunately, *HFN/RR* still has the excellent technical work of Martin Colloms, so that you can decipher (read, "ignore") the hype. I long ago stopped subscribing to *TAS*. I would read a review on what they considered the world's greatest hic-a-ma-jig, and they would be so nit-picky that I felt that if it sounded as bad as they describe it I wouldn't want anything to do with it—totally unbelievable. J. Gordon Holt always had a believability about his writing. Sure, he had difficulty with schedules, and I know he got bored with the whole thing at times, but there was that believability and integrity to his work even though I didn't always agree with him. That seems to have been largely lost with the new guard. Here, however, is an opportunity for *Stereophile* to be the first again. I don't believe there is any question about the intelligence or capability of the *Stereophile* staff; you have just become blinded and misdirected, hung in the trees looking for the forest. I hope that you can find a more open-minded and truly searching path.

The real subject of this letter, as well as of John's article, is objective *vs* subjective evaluation. I believe that the crux of the problem is the *true* statement by the subjectivists that the measurements don't seem to tell the story—poor correlation. The reason for this is not, as many would like to believe, some non-measurable ethereal quantity, but is simply due to an improvement in the state of the art such that many of the old measurements that were once important indices of sonic quality are now no longer significant. In addition, we listen much more critically now than we used to. Due to these factors, one measurement has become

much more important: frequency response. It sounds too simplistic, but the correlations are there. In my personal evaluations of electronic equipment, I long ago gave up measurement of nonlinear distortions as an indicator of sonic quality. They may still have some significance (as, for example, the potential distortions of electrolytic capacitors *vs*, say, a film capacitor), but their correlations to what I hear seem very tenuous when compared to the correlations with simple frequency-response differences. I do, however, feel that nonlinear distortions in the cartridge and loudspeaker are still of significance. In the case of the loudspeaker, there are, of course, many other factors affecting the perceived quality of the sound, such as directivity and room interface, which we have yet to get a good handle on.

I'd like to make some additional relevant comments concerning objective *vs* subjective evaluation. First, I don't believe any engineer worth his salt would finish a design without serious listening sessions. Therefore, there are probably very few, if any, pure objectivists designing and manufacturing sound systems—at least they won't be designing for long. Many "subjectivists" (including John) are not pure in that they seem to value certain measurements. Second, I believe there are few, if any, sonic differences that cannot be convincingly tied to some measurement. Third, it is naive to believe that the only measurements used by design engineers are simply frequency response, THD, and IM distortion. Fourth, broadband frequency differences of as little as 0.2dB or better in the mid-band appear to be detectable through careful listening. Therefore, a valid comparison requires that frequency response, as well as gain, must be controlled to better than 0.1dB. In fact, you cannot make a valid comparison between two pieces of equipment unless their frequency responses and SPLs are carefully matched. It is equivalent to comparing apples and oranges. I don't make these statements lightly, but rather as a result of many years of reasonably careful A/B tests, followed by careful measurements, on my part as well as on others'.

For example, concerning tube *vs* solid-state amps: because of the relatively poor damping factor (high output impedance) of most tube amplifiers, the frequency response of the amplifier driving a typical loudspeaker load will vary in the vicinity of 0.4 to 0.8dB! This amount of frequency-response variation will be clearly

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audible under the proper circumstances (see, for example, the careful work of Dr. Floyd Toole). A speaker with a very constant impedance characteristic will show little sonic difference between different amplifiers (provided the amps measure within 0.1dB over the important frequency range). This is not to say that there may be a sonic difference between amps (or preamps, etc.) with the same *operating* frequency response. However, experience has shown that the sonic differences, if any, will generally be quite small.

If two pieces of equipment have frequency responses that are identical to within 0.1dB and their gains are similarly matched and they still sound subjectively different in a controlled blind test, then we may have a valid reason for saying one is better than the other, as well as a good reason to investigate the cause of the difference. Speaking for myself as an engineer, I don't question that, for example, a polypropylene capacitor is better than the typical electrolytic, or that one circuit configuration may be technically better than another. The real question is whether there is an *audible* difference. If there is, is the difference explainable simply by standard measurements, or is the difference due to the exotic component or the unique circuit configuration?

Another area that is very significant to this discussion, especially since listening tests are important, is how we eliminate emotions and poor sonic memories from our product evaluations. I believe the answer is carefully controlled blind and double-blind listening tests. Subjectivists, however, seem to generally object to the outcomes of these tests; namely, the fact that they can rarely hear the differences that they were sure were there. I can understand the problem; I often believe I hear differences in noncontrolled tests, blind or not, that just don't seem to show up in well-controlled blind tests. Now, it is important to note, as has been correctly pointed out, that, due to statistical insignificance (as well as other reasons), if no difference is heard in a blind test, that does not mean that no audible difference exists. However, I would add that if one has used a wide range of program material, is not fatigued, and has listened for a reasonable period of time without being able to detect any difference in an instant A/B test, then the audible differences, if they exist, are insignificant (at least to that individual, even if he is a golden-eared subjectivist). Fur-

ther, I believe that, with a little thought, it becomes apparent that instant A/B tests should be used primarily to detect differences, and may not be usable to determine which piece of equipment is better or which I will like better. Long-haul listening is probably better for determining at least fatigue and possible "goodness," as long as we can somehow avoid a problem I've noticed: where I begin to like or get used to the poorer sound. Going to acoustic concerts helps here, but we then have the problems of differences in the hall sounds, orchestras, etc.

John knocks the idea that we tend to hear what we expect or want to hear. I think he is very naive, certainly about psychology. Of course we all hear differences, but do they really exist? If they do, are they simply explainable? A study of psychology reveals that it is well accepted that if a group of people all simultaneously observe an emotional incident, they will all describe what happened differently, based on their past experiences, background, and mood at the time of the incident, even though there is only one "truth" to the situation. The only answer to this situation that I know of is the instant blind A/B in which there is a reference to compare to; namely, the other product. Of course, all the same emotional factors can also prevent one from hearing differences if and when they exist. However, they will not be able to show with any statistical significance that a difference exists when it doesn't. Maybe there is a better way than the instant blind A/B. Certainly non-blind testing is not the way. It may be satisfying to the ego, but it is clearly unsound scientifically. I leave it to those more creative than I to determine a better way.³

Finally, although there is much more that could be said, I'd like to congratulate Quad on publicly standing up for what they (as well as I) believe to be the truth. It's unfortunate that we live in a world where the dollar is more powerful than the truth—partially because the truth is often difficult to discern, especially with the "authorities" telling us the opposite. I would like to believe that there are many other manufacturers who also know the truth. However, I presume that many are intimidated enough by the underground press and/or the potential dollar effect that they are unwilling to express their true views. I also realize that there may be many manufacturers that actually believe much of the hype, and that's all right too (it's pitiful, but everyone is free to believe

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whatever they want). However, that hype should not be propagated in a magazine such as *Stereophile*.

John Koval
Santa Ana, CA

Acoustat mods

Editor:

In Vol. II No. 4, April 1988, *Stereophile* published a review by Dick Olsher of modifications to Acoustat loudspeakers done by PKR&D. I subsequently arranged to have all of the modifications that company offers done to my Acoustat 2+2s.

Before the modifications, if I changed something in the system such as an amplifier, pre-amp, or cable, I might notice a bit of difference. Now, if I make such changes, the differences are astounding. Additionally, the resolution of the speakers is so much better, they are noticeably more transparent, and the soundstage makes the music very lifelike. I am, obviously, very pleased with my modified Acoustats.

I am writing to thank you for publishing the review and follow-up of this product, which put me in touch with Phil Keck. My telephone relationship with him while he was doing the modifications was very amiable.

Edward M. Slicher
Baltimore, MD

Problems with VTL

Editor:

VTL Gives No Lifetime Warranty:

That's right. The VTL company does not give a *written* warranty with their equipment, and David Manley's *verbal* lifetime warranty isn't worth a cent. I say this from personal experience.

I purchased two 225 monoblock amplifiers from the VTL company last October for \$4200. They arrived with not a piece of paperwork. No warranty card, no operating instructions, no warnings, and no care instructions. I repeatedly asked my dealer for the warranty card, but was told they have a "Lifetime Warranty;" no need for me to worry.

It turned out that one of the amplifiers was defective from Day One. The dealer was not able to repair it, and Mr. Manley asked that it be returned to the factory. I was assured that it would be fixed and returned to me. Mr. Manley then asked that I return the other one to the factory also because he was afraid it might develop the same problem in due time. In good faith I sent the second one back. Well, *that was the last I saw of my 225 monoblocks.*

After an exhausting number of phone calls that were never answered until weeks later, I was offered all sorts of strange substitutes that I never wanted. Upon insisting that he return my original amplifiers, Mr. Manley told me that I could have my money back. This he told me in a nasty letter that ended, "Goodbye, Mr. Belterri. Have a nice day." *This is VTL's lifetime warranty?*

Too bad JGH didn't say "the manufacturer offers a *verbal* lifetime warranty" on p. 115 of his review of VTL's 300W monoblock in the October *Stereophile*. Perhaps your readers should turn away from buying anything from such an unscrupulous company as VTL.

R. Belterri
Nutley, NJ

VTL's David Manley responds to the points raised in Mr. Belterri's letter in "Manufacturers' Comments."

—JA

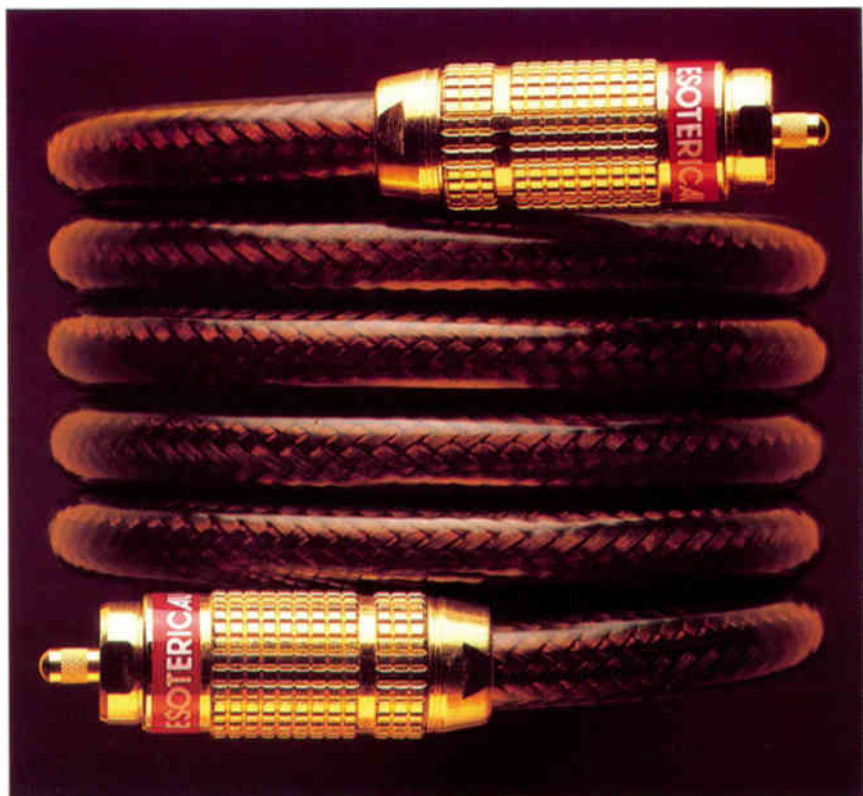
The final opinion?

Editor:

As an owner of the Audio Research SP9 pre-amp, I would like to state, once and for all, that this preamp is not only a sonic masterpiece, it is a downright steal at the asking price. The only criticism it deserves is that it is very much underpriced. William Z. Johnson and his teams of engineers should be fully congratulated for creating a preamp of this caliber in this unheard-of price range. I personally cannot thank them enough for their creation.

To experience the full beauty of the music re-creation of which this preamp is capable, it must be used with proper auxiliary equipment, particularly cartridge and amplifiers, *and* the equipment (mainly cartridge-tonearm interface) must be properly adjusted. If the adjustments are the slightest bit off—and I mean slight—it will be very obvious. This preamp is so transparent and so revealing that it will at last tell you just how good the sonic capabilities of your other components really are. Furthermore, this preamp requires an excessively long initial burn-in period. We're not talking hours or days, we're talking at least one month (possibly longer) of playing music through it before it reveals its innermost beauty. After this break-in period, I recommend anywhere from three to six hours of warm-up time before a listening session.

I'd like to suggest to those who have either listened to this preamp in a showroom, or have



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borrowed one to try on their existing systems, and have found it to be unacceptable, that they have not abided by the above conditions. But for goodness' sake, using this preamp with their existing components has most likely shown them what those components are really capable of, because this preamp reveals the truth.

Give this preamplifier time, with the proper components, and you will never be sorry you purchased it.

Ira Kohn

Livinston, NJ

PS: Have you noticed how boring audio publications have become since they started covering the CD medium?

Recommendations

Editor:

Even though I'm a long-time subscriber, I've never felt the urge to drop you a line until now. I'd like to bring to other readers' attention two items of interest:

The Arturo Delmoni LP distributed by North Star Records (*Stereophile* Vol. II No. 8, p. 189) is not their only noteworthy release. I've bought a few of their other LPs and have found each to consist of good performances by relatively unknown artists, recorded exceptionally well. Give 'em a try!

George Kaye's Sound Services modification of the Moscode 300 is nothing short of sensational! (See "Manufacturer's Comments," Vol. II No. 11.) He transforms a good amplifier into a great one in my estimation (and, I expect, his modification of the 600 should do the same). Anyone who is considering unloading his/her Moscode because of NYAL's demise ought to seriously consider having Mr. Kaye work his magic on the unit instead. To say the least, the move would be cost-effective, as the improvement in sound far exceeds the modest cost of the modification. In my dealings with Mr. Kaye while having my '300 modified, I was also left with the distinct impression that he will provide ongoing support if a Moscode unit ever develops a problem.

Al Bickoff

Arlington Heights, IL

The best *Manfred*

Editor:

I enjoyed Christopher Breunig's survey of some of the recordings of Tchaikovsky's *Manfred* symphony in your November issue. I agree that there was a period in the 1950s when the only complete recording was the one by Paul Kletzki.

However, in the late 1950s, everything changed with the release of Sir Eugene Goossens's recording on Everest.

But for me there is only one standard for Tchaikovsky's *Manfred*: The mid-1940s recording by the Indianapolis Symphony Orchestra under Fabien Sevitzyk. This the only recording I have heard in which the trio in the second movement ("By the Waterfall") is not taken at the wrong tempo. Every other conductor I have heard takes it too fast. Too slow can be maudlin, and I think most conductors speed up for this reason, but Sevitzyk gets it just right.

Unfortunately, the engineer in charge of the transfer from 78s to my Camden LP was so intimidated by the Toscanini mystique that he butchered the last movement in imitation of the Toscanini recording. Now, in the CD era, where new life can be brought to 78 originals, I hope that somebody will do it right. In the meantime, I'll continue to play my Goossens Everest for the outer movements and my Sevitzyk Camden for the inner movements to get my ideal performance of the complete *Manfred*.

John P. Dahlquist

Oakland, CA

The heretical menace

Editor:

It's a puzzlement. Here I sit, November 1988 issue in hand, wondering why Larry Archibald is acting like the neighborhood bully beating up on that new little kid on the block named *Hi-Fi Heretic*. Is it really because of Kent Bransford's choice of typesetting and his admiration for Linn products? Are these complaints even valid?

Well, I suppose *Hi-Fi Heretic's* print style is somewhat less than elegant. It is, however, *big*, *black*, and *bold*. Does *Stereophile's* typesetting display true high-end resolution and "cadence"? A judgment on that will have to wait until I can borrow an electron microscope.

Is Kent Bransford really a worshipper at the altar of Linn? Let's see. He does use a Linn Sondek/Itok front end to evaluate components for review, but then, so does the editor of *Stereophile*. "Strident pro-Linn Bias"? I doubt that Ivor Tiefenbrun broke into a highland fling after reading Kent's recent review of the Linn Nexus speaker system.

Okay, even if we assume that Archibald's criticisms *are* valid, they're still just too darn trivial to rate a paragraph in a serious high-end publication like *Stereophile*. They must be a



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ENERGY 22

smokescreen for some deeper, more urgent concern. But what?

Aha! I think I've found a clue here in an editorial in *HFH* No.9. Bransford seems to think that some people spend small fortunes on stereo equipment just to convince themselves of their high levels of culture and refinement, while still other people fritter away so much time, energy, and money on their systems that the term "audiophile" is often synonymous with "compulsive neurotic." He even says that some audio magazines make their living by preying on the insecurities of these unfortunate souls.

As if this isn't disturbing enough, he goes on to write, "Truly cultivated and perceptive individuals are too busy *living* to waste time contemplating their own wonderfulness. If they want a good hi-fi, they shop around until they find what they want, and make the purchase. *And then they will get on with their lives.* They surely won't lie awake nights wondering if they bought the right equipment."

That kind of talk conjures up some pretty frightening images, doesn't it? Just imagine 45,000 *Stereophile* subscribers sitting down to write out another \$35 check. Suddenly they all sit bolt upright with the realization that they're perfectly happy with their current audio systems. They write themselves a check instead, and begin filling their shelves with new record albums instead of all those back issues of *Stereophile*. The bravest among them even begin venturing out to live concerts. Dealers start to go broke. Publications perish. Reviewers are seen standing in bread lines . . .

Now that I see where you're coming from, Larry, I'm behind you all the way. Like Creeping Communism or the AIDS virus, heretical notions like Bransford's should be quickly nipped in the bud before they spread and infect us all.

Craig H. Fowler
Claremont, CA

Really, my praise was heartfelt—and it's rare, too. If I truly feared HFH the last thing I would do would be to criticize them in print. Kent Bransford has already thanked me for the mention—and this letter will make it even more appropriate. (He agrees about the typesetting, by the way. Just can't afford better at this time.) Actually, I like Mr. Fowler's idea—all those people who've never attended a concert finding out what it's really like. —LA

A question

Editor:

For your information, I built the PAS-1 passive control center described in Vol.11 No.2. It sounds great! While I really appreciate the "subjective" style of your journalism, more useful projects of this nature (DIY modifications to existing components, perhaps?) would be much appreciated.

A question: Would it be possible to get some photocopies of relevant articles from back issues without having to buy the whole issue? I have approached Creative Audio (listed as the source for *Stereophile* in my area), but they are very reluctant to let customers browse through their collection of back issues, never mind borrow or read them. I am interested in reviews of interconnects (Vol.10 No.2), the Hafler XL-280 (Vol.10 No.1), the Quad 306 (Vol.10 No.3), and the Thiel CS3.5 (Vol.10 No.1); however, I do not wish to pay \$5 each for a few pages of information.

Victor A. Harder
Winnipeg, Manitoba

I investigated whether it would be economically feasible to implement such a photocopy scheme as described by Mr. Harder, but it turns out to be actually cheaper for a reader to buy the complete back issue containing the review he or she is interested in. —JA

The case for minimalism

Editor:

As a new reader of *Stereophile*, I would like to offer a few words in defense of minimalism in audio reproduction, prompted by Keith Yates's article in the November, 1988 issue of your magazine.

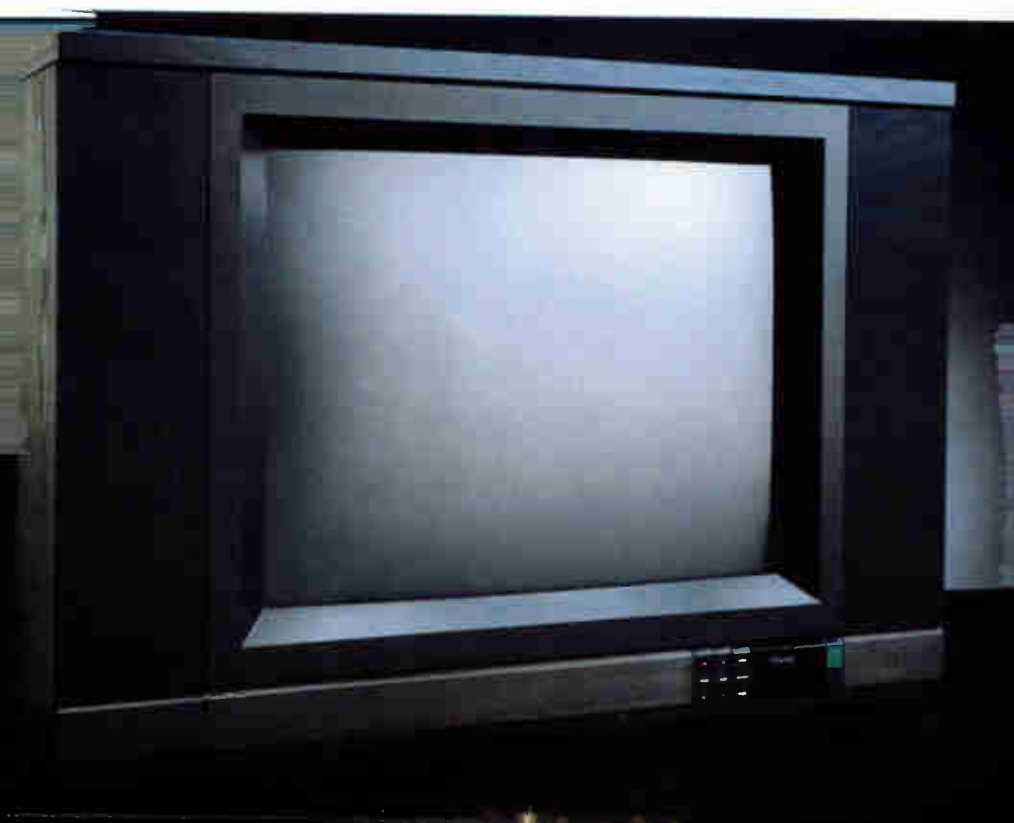
The idea of musical signal manipulation is as old as the recording process itself. Its origins are firmly rooted in the imperfections of audio reproduction, and it has been widely used by both professionals (when recording) and amateurs (during playback) to render music that has been compromised by recording conditions or playback-system aberrations more acceptable. Until the advent of digital, the studio engineer was stymied in his valiant attempts to creatively mold the music signal by the audible noise penalty inherent in analog reproduction. Thanks to digital's lack of noise, manipulations of the music signal have been achieving a status, if not of an art form, then of an artistic endeavor in the eyes of our unselfcritical record-

ing industry and a dimwitted musical consumer.

At the professional level, the amount of manipulation that goes on singles out music reproduction as the most heavy-handed of all art reproduction fields. Since commercially, music is the most widely reproduced artform, the recorded and live varieties have been injected with a healthy dose of commercialism. Too often today, the finished "music product," be it a recording or a new rock group, has relatively little to do with musicians *per se*, but rather is masterminded by the market-wise producer. The lack of talent and glut of mediocrity in popular music today promotes these practices. In other art reproduction fields (the publication of literature and visual art forms, for example) you do not find the heavy-handed manipulation that exists in audio. These fields have firmly established traditions of attempting to faithfully reproduce the original, often requiring both extraordinary skill and artistic sensitivity. While music reproduction is special to an extent in that some manipulation and processing is inherent, it is not radically different from the reproduction of other art forms, and should be treated accordingly. In essence, the public acceptance of heavy manipulation

of musical performance in recording denigrates music as an art form and reduces it to the level of "product."

The propensity for signal manipulation at playback stems from what can be best termed the "perceived knowledge" of hi-fi reproduction instilled in the consumer, by both mass-market manufacturers and mass-market media. Everyone "knows" what hi-fi is all about, especially with helpful advice from the knowledgeable salesman and informative ads in *Stereo Review*. The average egocentric hi-fi buff also wants to be part of the creative chain, and does not think twice about pressing those useful buttons into service. In the audio industry, this perceived knowledge serves the useful purpose of stroking consumers' egos and steering them into the shops, where the knowledge is reinforced at the proper price level and sealed with a purchase. In fact, dickered with an already dickered recording is such a common practice in home music reproduction that most people would consider their gear inoperative if it did not come at least with tone controls, a convenient situation for the manufacturer since buttons and a few chips are much cheaper than good power supplies.



Out of this perceived knowledge, based on ignorance, the concept of loss-less digital processing was conceived. While it's true that digital signals can be passed along without degradation, manipulation of the digital signal via complex mathematical algorithms is as prone to sonic degradation as its analog counterpart, albeit of a different kind, in a digital space. Anyone with a rudimentary knowledge of programming will realize this. Unfortunately, there is no free lunch.

It is possible to enhance the artistic merit of the performance through the use of sound manipulation in the studio or at home, but, given the level of musical talent available today along the reproduction chain, it is not very likely. In a nutshell, an enhancement of the musical performance requires a level of musical talent common with that of the performer at every step of the reproduction process (to borrow the Linn line in reverse). Simply stated, music-studio dickerers and hi-fi nerds do not possess this musical talent. And any change they will perform on the musical content of the performance is likely to be disastrous. When a level of common talent does exist, it usually implies a common level of mediocrity, and an

end result so lackluster that it renders any beneficial effects unimportant (such is the case with popular music today). If we want to play amateur sound engineers, fine and fun, but the artistic integrity of the musical performance lies with the music alone—acoustic or electronic. The recent rise of composers of electronic music is a good example. There will probably be (or already are) teams of musicians, each specializing in different aspects of electronic music creation. I hope the difference between them and an audio dickerer is readily apparent.

The very difficult job of the studio engineer is to create a recording with as much musical allegiance to the performance (live or studio) as possible. This job requires tremendous talent and artistic sensitivity, not less than that required of a musician. Musical allegiance to the performance—sometimes called minimalism because it eschews mile-long signal paths, heavy use of limiters and processors, and thoughtless multimiking—is the only way to lift music reproduction out of the obscurity and mediocrity where it lingers and elevate it to the status of an artform where it belongs.

I pity the future audiophile as described by Mr. Yates. When I put *Nojima Plays Liszt* (Thank

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*Quoted with permission from the November, 1988 issue of Video.

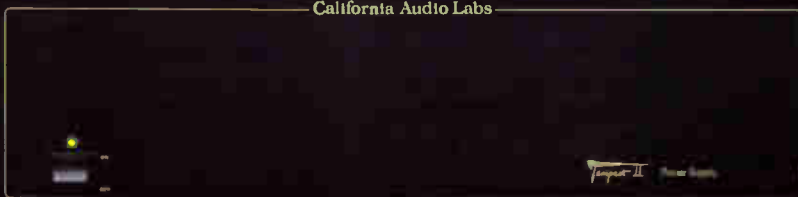
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you, Dr. Johnson) on my Rega turntable, turn on the SA-12 amplifier, adjust the volume on my modified NYAL Super-it preamp, and dig the music that is not confined by the Musical Fidelity MC-2 speakers, my only worry is that the smoke from my cigarette does not damage the suspension of my brand new Shure V-15 type 5MR cartridge. By this time, our music lover from the brave new world of Mr. Yates would have succeeded in injecting some life into a tired digital recording by massaging it with an ambience recovery algorithm on a Macintosh computer. Poor man.

Dimitry Zarkh
Allston, MA

Credit to GSI

Editor:

I would like to give credit where credit is due and mention GSI's 6DJ8 input board for the Dynaco ST70, with both 6CA7 pentode and 8417 triode output tubes. This is one of the best values in audio. With the 6CA7s the ST-70 becomes dynamic and crisp, with good punch. Changing to the 8417 triodes produces slightly less dynamics, but beautiful depth and sweetness.

Gary A. Fretz
Red Hill, PA

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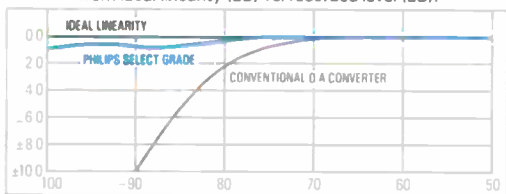
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—Bruce Bartlett, *High Performance Review* April 88

"The Thiel 3.5 is a true standard for dynamic speakers. An extraordinarily musical speaker. My compliments and praise to Mr. Thiel."
—Bebo Moroni, *Audio Review, Italy* April 87

"The (CS3.5's) overall treble performance is superb ... No electrostatic that I've heard comes close."
—Anthony H. Cordesman, *Stereophile* Vol. 10 No. 1, January 87

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—*Audio Ideas, Canada* Summer 87

"The imaging on these speakers is nothing short of amazing ... The CS3 has quite remarkable detail."
—Gordon Holt, *Stereophile* Vol.7 No.3, May 84

"The CS3 is simply a superb-sounding loudspeaker with a remarkable natural tonal balance and excellent imaging."
—*High Fidelity* Vol. 34 No. 6

"The exceptionally fine impulse response clearly verifies the CS3's claim of being a coherent-source loudspeaker."
—Richard C. Heysler, *Audio* November 85

"... musically, the CS2 is outstanding ... The imaging and depth are coherent, tightly focused, and exceptional."
—Anthony H. Cordesman, *Stereophile* Vol. 8 No. 6, October 85

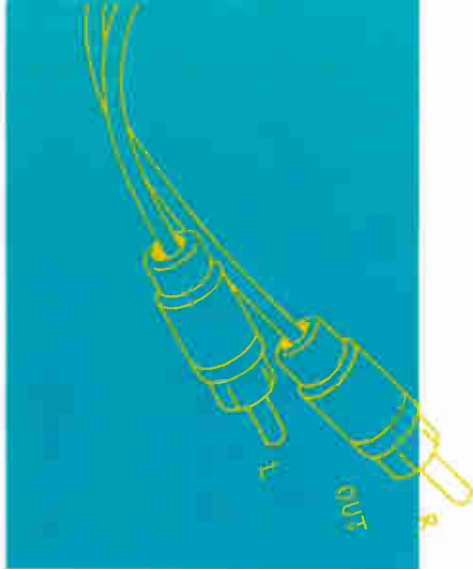
"After the first couple of minutes, we had no doubt that the CS2s were exceptional speakers."
—Julian Hirsch, *Stereo Review* January 86

"The CS2 provides incredible stereo imaging with stunning depth. This is the speaker of choice for the music lover in search of a true rendition of timbres and dynamics."
—*Revue Du Son, France* June 87

"The Thiel CS1s are excellent portrayers of musical detail, and they faithfully and naturally reproduce all timbres."
—*Hi Fi Heretic* number 7

"The CS1s do it all. Indeed this is a highly musical system."
—*Revue Du Son, France* November 86

UPDATE



USA: Peter W. Mitchell

The recent AES convention in Los Angeles featured an event that was both entertaining and depressing. During the first three days of the convention, attendees were invited to participate in blind listening comparisons among three power amplifiers (Crown, Threshold, Vacuum Tube Logic) and two varieties of speaker cable (Monster and Belden), as well as a distortion-perception test.¹ David Clark, inventor of the ABX comparator and organizer of the event, compiled statistics on the listening tests. Overall, the attending engineers scored no better than random chance in trying to identify amplifiers and cables by ear. Skeptics may take this as further evidence that high-end audio, like astrology, is a gigantic exercise in self-delusion. But some listeners scored close to 100%, demonstrating to themselves (if not to others) that these differences are real.

When Clark announced the result, I remembered the following story. Several years ago Canada's National Research Council was asked to select new monitor speakers for the Canadian Broadcasting Corporation. Physicist Floyd Toole assembled about two dozen candidate speakers from England, the US, and Canada, measured their performance in a test lab, and also conducted subjective comparisons using listening panels composed of engineers, musicians, and audiophiles. When he cross-correlated the objective and subjective tests, the

¹ See also *Stereophile*, January 1989, p. 53.

“It is so clearly superior to past amplifiers in the low- to mid-priced range— not to mention most amplifiers two to three times its price— that I can unhesitatingly recommend it for even the most demanding high end system.”

Anthony Cordesman

stereophile

vol 8, no. 4

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results were disappointing.

On the average, listeners assigned higher rankings to speakers with smooth frequency response than to speakers whose measured response was rough and irregular. But there were many inconsistencies and disagreements in the subjective rankings. The same speakers were judged excellent by some listeners and mediocre by others, or ranked high on Monday and mediocre on Tuesday—even by the same listeners. With so much scatter in the rankings, little confidence could be placed on the selection of the “best” speakers. So Toole used the rankings to analyze the performance, not of the speakers, but of the listeners.

As it turned out, some listeners were remarkably consistent in their judgments of each speaker, giving each speaker essentially the same rating from day to day and regardless of which other speakers were included in the comparison. Their “subjective” assessments had nearly the same stability as an “objective” meter reading. Other listeners were very inconsistent in their judgments.

Toole subjected each of his listeners to a standard audiometry test, which determines the individual’s hearing threshold at several frequencies, and discovered a clear correlation with their judgments of speaker quality. Listeners whose hearing threshold fell in the medically “normal” range (*ie*, with no impairment greater than 20dB) produced consistent rankings. Their judgments were repeatable from day to day, and they agreed with each other’s rankings. Listeners whose impairments exceeded 20dB at midrange frequencies were unreliable judges of speaker quality; they didn’t agree with each other, or even with themselves (their own judgments in other sessions).

Of course! What else would you expect? It is hardly surprising that people with good hearing are reliable judges of sound. But it is important, because hearing impairments are very common among adults. Note that we’re not talking here about presbycusis, the high-frequency loss that occurs with age, but about midrange losses that are caused by disease and exposure to noise. Such losses are as common among musicians, engineers, and audiophiles as in the general population. If you habitually drive with the window open, pilot a piston-engine airplane, go hunting or target shooting, were exposed to howitzers in the Army, operate noisy machinery at work, or have been exposed

to any sound levels above 110dB for more than brief periods, you may have an impairment without realizing it.

I speak from experience. I had an audiometry test last year and learned, to my surprise, that although my right ear is still fine, I have a 15dB loss in my left ear—barely within the “normal” range. The loss occurred gradually over many years, but the brain compensated; subjectively, both ears still seem fine to me. My audio judgment hasn’t been affected yet, and I wasn’t the world’s most golden-eared reviewer anyway. But a further loss could have serious consequences. In warm weather I now use my car’s air conditioner rather than driving with the window open.

Incidentally, after discovering the correlation between hearing ability and judging consistency, Toole ran a second series of listening comparisons. The lowest-ranked speakers in the first round were eliminated from the re-test, as were the listeners with impaired hearing. When the results were analyzed, clear patterns emerged. The objective measurements of frequency response correlated well with subjective listener preferences, and a handful of speakers clearly stood out as the best. One of those, a Canadian model, was finally selected for the CBC.

My point in telling this story is not to suggest that audio reviewers ought to have their ears tested and publish the results. But whenever I hear a report, like that of the AES listening test, indicating that a small population of audiophiles may be acutely sensitive to something that most people don’t even hear (such as differences between amplifiers or cables), I wonder whether differences in hearing ability might be precisely the issue. If we all had audiometry tests, would we discover that audiophiles and reviewers who are sensitive to amplifier and cable differences comprise a special subset of the population with unusually acute hearing?

Suppose this were true. What would be the value of knowing it? For one thing, it might reduce the hostility between skeptics and high-end enthusiasts. Skeptics would stop accusing audiophiles of self-delusion if we could show that becoming a high-end audiophile is a self-selection process for people gifted with unusually acute hearing. High-enders might be less quick to sneer at *Stereo Review’s* “tin-eared” reviews if it were found that Julian Hirsch has

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statistically normal hearing (with 10-20dB of impairments), while high-enders are a favored minority of statistical geeks. And some of *Stereophile's* readers might be less frustrated if we could tell them that their failure to perceive everything described by the magazine's reviewers is not due to a moral flaw, nor a lack of musical sensitivity, but to a normal difference in biology.

Don't take me too seriously here; this is just speculation. We don't know why sonic differences are obvious to some listeners and not to others. Experience—learning what to listen for—is part of the story, but probably not all. We certainly don't know whether hearing sensitivity plays a role. If reviewers and high-end audiophiles don't subject themselves to audiometry, we may never know.

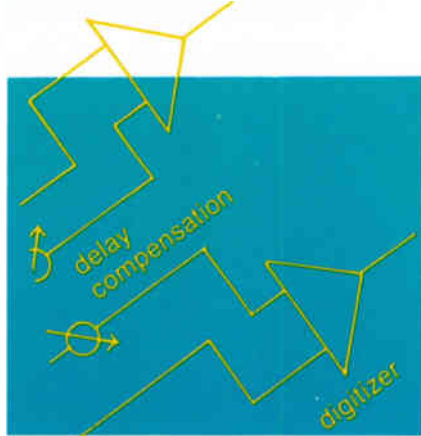
A Modest Proposal

Why are people willing to spend hundreds, sometimes even thousands, of dollars on the wires that connect amplifiers to loudspeakers? Why is there a market for exotic speaker cables? The obvious reply is that the choice of speaker wire can affect the sound. Indeed it can. But is exotic cable the best response to that discovery? Several years ago, special circumstances led me to a simple solution for the problem of speaker wiring. Now, as I observe the ongoing debates about cables, I wonder why the same rather obvious solution hasn't been adopted by the entire population of high-end audiophiles.

The obvious solution: If speaker wires alter the sound, eliminate them. At the very least, reduce their effect by shortening them; install your power amp between the speakers, so that each speaker cable need be only three or four feet long rather than having to run around the room to the equipment rack on the opposite wall.

For best results, eliminate the speaker cables entirely. Dedicate a separate mono amplifier to each speaker, installed directly behind it and connected to the speaker terminals with very short metal links. (In some quarters it has become customary to glorify mono amplifiers by using the adjective "monoblock"—or, for more sex appeal, "monobloc"—but that is a silly affectation.)

I warned you that it's a simple idea. And it's neither new nor original. In fact it is a common practice in pro audio to locate an amplifier



directly behind the speaker it is driving, and in high-end audiophile circles this is occasionally done for reference purposes. I have read numerous magazine reviews of speaker cables in which the tester set up a reference system this way, connecting an amp to a speaker with a short link; then the speaker cable that most closely approached the performance of the "no-cable" reference was judged the best.

If this is appropriate for testing, why not adopt it for everyday use? The obvious drawback is that the majority of power amplifiers are stereo units. But in high-end audio there already is a trend away from single-chassis stereo amps toward pairs of mono amps, and this trend should be encouraged—because of a distortion mechanism known as dynamic power-supply modulation.

In a preamplifier, the amount of current drawn from the power supply by each circuit is quite small, often measuring only a few thousandths of an ampere; so with the aid of voltage regulators and decoupling capacitors, it is relatively easy for the manufacturer to maintain clean, steady DC operating voltages in the circuit. Then two preamp channels can be operated on the same chassis, sharing the same power supply. These demands cause power-supply voltages to vary rapidly, and corresponding ground-path currents also produce moment to moment, and instantaneous peak currents as large as 20A may be drawn from the power supply. These demands cause power-supply voltages to vary rapidly, and corresponding ground-path currents also produce momentary nonzero voltages along the wires and circuit-board traces that represent the circuit ground. When two amplifier channels share the same power supply and ground paths, varying power demands in one channel can

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Further improvements are included in the Model IIX Electronic which has a satellite power supply for perfecting motor operation and speed selection, also the 'Top of the line' Model IV Electronic which is designed to extract the utmost potential from these new developments.

WHAT THE CRITICS SAY

Reprinted by kind permission from WHAT HI-FI - September, 1967.

Summary
Construction *****
Ease of use *****
Sound Quality *****
Value for Money *****

Extract
On audition I was immediately struck by the marvellous sense of ambience and 'space' recovered from many recordings.

Reprinted by kind permission from WHAT HI-FI - September, 1968.

Summary
Construction *****
Ease of use *****
Sound Quality *****
Value for Money *****

Extract
An excellent deck then and, given price, construction and sound quality, probably the best buy of the group.

Reprinted by kind permission from HI-FI SOUND (Test Bench) - Canada.

Comment
We performed the shake test twice, we could not believe it the first time.

Extract
The Systemdek's suspension is one of the most effective we have ever seen, as the graph on this page indicates most of the curve is right off the scale. Amazing.

Reprinted by kind permission from HI-FI HERITIC - No. 9, U.S.A.

Comment
The elegant practical design of this deck makes many other turntables look a bit silly.

Extract
Finish of the Systemdek was absolutely stunning for this price range. In terms of appearance the IIX embarrasses many decks twice its price.

Reprinted by kind permission from AUDIO VIDEO MAGAZINE - N.Z. April 1968.

Comment
One of the things I like doing with this magazine is finding Hi-Fi equipment that sounds great yet it does not cost the earth. That's one of the reasons I'm so excited about the Systemdek IIX turntable.

Extract
Not only does it give exceptional sonic value for money, but it also looks highly attractive and is as easy to use as a manual turntable can be. Highly recommended.

Reprinted by kind permission of WHAT HI-FI - 1969.



Equipment Awards

Editor's Comments

Even in the bargain-basement IIX version, however, the turntable has a natural, open sound quality with excellent instrument separation. It offers exemplary isolation from acoustic feedback and structural vibration, plus the flexibility to take a wide range of tonearms. The overall package is undoubtedly a very attractive one.

The deck is even a treat to look at, superbly finished in a traditional manner. The overall dimensions are bigger than usual, and you never feel cramped using the Systemdek.

Indeed, the whole deck is clearly designed with user-friendliness in mind, even though it hardly ever needs attention once set up. No wonder then that the Systemdek IIX caught the eyes - and ears - of our panel of judges.

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intermodulate with the signal in the other channel, affecting imaging as well as sound quality.

By using separate mono amps instead of a stereo power amp, you eliminate this potential source of smeared imaging and cross-channel intermodulation (heavy bass passages in the right channel affecting the reproduction of delicate flute timbres in the left). You also gain the freedom to eliminate speaker cables by locating each amp within inches of the speaker terminals.

Even if your favorite brand of amplifier is available only in stereo form, you may still benefit from using a separate amp for each channel. Some stereo amplifiers can be converted to bridged mono operation, doubling the output power. If yours can't, or doesn't sound good in that mode, you may still gain some extra power by using only one channel. (Stereo amps are rated with both channels driven simultaneously. When only one channel is driven, there is less drain on the shared power supply; so an amp rated at 100Wpc for stereo may produce 140W when only one channel is used.)

Another option, since I am a surround-sound enthusiast, is to use each amplifier's spare channel for rear speakers, which typically require only one-fourth as much power as the front speakers. The Yamaha DSP units and the Lexicon CP-1 processor are quite different, but each can be adjusted to produce a very realistic you-are-there concert-hall ambience that leaves two-speaker stereo in the dust.

One potential drawback remains. If you want to have your preamplifier controls within arm's reach of your favorite chair, while your power amps are mounted behind your speakers at the other end of the room, you may swap one problem for another: while eliminating the need for long speaker cables, you have created a need for long interconnect cables. It's true: the cables that connect my preamp to my power amps are over 20' long.

That doesn't have to happen. Some people already have their preamps at the same end of the room as their speakers. I couldn't do that; many recordings have small balance errors, and depth imaging and general realism can often be improved by fine-tuning the balance control while listening. Therefore the controls must be accessible from my chair. Happily, with the advent of remote controls that don't screw up

the sound, even that restriction is fading away. Nevertheless, the question of long interconnects should be dealt with.

The principal concern is the output impedance of your preamp. To avoid a high-frequency rolloff, long interconnects should be driven from a low output impedance (under 1000 ohms), preferably from an output buffer designed for unconditional stability regardless of the capacitance of the connecting cable. Methods for designing a preamp's output stage to meet these criteria are well-known to electronic engineers, and many preamps are fine. Several recent preamps and CD players have made a special point of providing a low-impedance output optimized for driving long interconnects. But in some minimalist preamps designed more for purity than practicality, this point may have been neglected. If your preamp doesn't drive long cables well, you could add a low-impedance buffer at its output. Designs for such buffers, one available in kit form, have been published in *The Audio Amateur*.

If interconnect cables inherently altered the sound as much as speaker cables do, then long interconnects might be a bad idea. But I don't think that's true. Generally speaking, both theory and experience indicate that sonic differences between interconnects are much subtler than those between speaker cables. I suggest, as a working hypothesis, that a 20' interconnect from preamp to power amp, followed by a direct connection between power amp and speaker, is more likely to deliver sonic nirvana than the usual arrangement of a 3' interconnect plus 15' speaker wires. Here are several reasons why interconnects are more likely than speaker cables to behave ideally:

- Impedance is non-critical. An interconnect feeds a high load impedance, usually over 10k ohms; compared with this, the impedance of the wire itself is trivial. The diode-like nonlinearities contributed by oxidation on conductor surfaces, and by copper-oxide impurities at crystal boundaries within the wire, are also small compared with the load impedance. Speaker wires, in contrast, are loaded by a low impedance, typically 6 ohms or less; compared with that, the impedance of the cable can be a significant factor, especially since it may vary with frequency due to braiding capacitance, mutual inductance, skin effect, and so on.

- Power levels are small. Interconnects carry modest voltages (typically 1V maximum) and

Linn Ekos Arm

The big news from Linn this month is the new Ekos tone arm. The name is another of Linn's infamous plays on words. *Écosse* is French for Scotland. Stick in a K, and you have a new tone arm that is totally manufactured in Linn's own factory. (The Ittok and Basik arms were designed by Linn but built in Japan.)

Since Linn is well known for their precision machining, we naturally expected this nearly-two-thousand-dollar, handcrafted arm to be something special. We were not disappointed! The Ekos continues the tradition established with the Linn Ittok Arm. The design of the Ittok, an arm that has been continuously proven and refined throughout the years, is actually the foundation upon which the Ekos was developed. As continued research proved that the original design was technically sound, the next step was to dramatically improve the materials and tolerances used.

Visually, the new double-damped cueing and integral arm rest are the only obvious indications that the Ekos is not simply a black Ittok. However, new alloys (machined rather than cast) give an extra degree of stiffness and rigidity to both the headshell and bearing yoke. The bearing shafts are machined to a higher tolerance and individually matched to precision measured ball races to achieve a bearing tolerance of one micron (one thousandth of a millimeter)! As a result the Ekos comes the closest to being *the* theoretically perfect device for coupling a cartridge to the turntable.

After even the briefest of listening sessions, it was obvious that the Ekos was able to retrieve vastly more information from the record. It was much easier to pick out individual voices or instruments. The retrieval of low frequency material improved dramatically. Overall, it was simply much easier to follow along with the music.

The most surprising thing was the arm's ability to get every last ounce of performance out of a cartridge. Our original listening was done with the Linn Troika, a moving-coil that sells for over fifteen hundred dollars. It wasn't a surprise when that cartridge ended up sounding better than ever. The real shocker came when a \$275 Linn K9 Cartridge on the Ekos was able to deliver performance that surpassed the Troika on any other arm.

Our advice -- if you're looking at an expensive moving-coil cartridge to stick in your existing arm, forget it. Keep your current cartridge and buy an Ekos. Not only will it last you a lifetime, but when you do finally upgrade your cartridge, the Ekos will allow you to get the best out of it.

Since the best of Linn's technicians can only produce sixteen arms per week, supplies of the Ekos are likely to be quite tight over the next few months. However, we think you will find the Ekos well worth the wait.

For additional information on these and other Linn products and the name of the dealer nearest you contact:

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Aldburn Electronics, 127 Portland Street, Toronto, Ontario, Canada M5V 2N4 (416) 863-0915

small currents (less than 0.1 milliamp). Speaker cables must cope with large voltages (up to 100V peak) and currents (up to 20A), creating correspondingly intense electric and magnetic fields within, between, and around the conductors.

- Source and load are resistive. Capacitive and inductive effects play only a very small role in determining the output impedance of a pre-amp and the input impedance of a power amp. These impedances are usually set by resistors. Therefore the current stays in phase with the voltage, and the electromagnetics theory describing the signal's behavior in an interconnect cable is well-behaved. But in the case of speaker cables, the load impedance (the loudspeaker) is notoriously complex, with large and rapidly varying phase angles between voltage and current. The source impedance (the output of the power amplifier) is also complex, especially at ultrasonic frequencies, in part because of the Zobel network. This is the inductor/capacitor network that connects the output transistors to the speaker terminals in most power amplifiers, providing isolation that stabilizes the amp against ultrasonic oscillation. To make the situation even more complex, loudspeakers don't merely absorb power; they also generate back-EMF voltage spikes when the magnetic field around the voice-coil collapses following a transient. Because the amp/speaker interface is so complex, the effect of the speaker cable tends to depend on the choice of amp and speaker.

- Interconnects are coaxial. Speaker cables usually employ twin-lead construction, with the outgoing and return currents carried by separate cables running in parallel. In this arrangement, as you know if you've ever installed twin-lead wiring for an FM or TV antenna, there are significant electric and magnetic fields around each wire, which may interact with each other (depending on the separation and braiding of the wires) and with any other metal objects nearby (AC power wires, baseboard heating ducts, pipes in the wall, *et al*). Interconnects, like modern antenna cables, use a coaxial arrangement that tends to concentrate the electric field in the dielectric between the conductors, isolating the signal from outside influences.

- Interconnects are shielded. With coaxial construction, the outer conductor (the signal-return wire) acts as a shield against electromagnetic interference. To obtain even better immu-

nity from external influences, in professional audio all interconnects are "balanced," using a twisted pair of wires (which naturally resist interference) for signal "hot" and return, surrounded by a separate shield. Since my power amps don't have balanced inputs, I use a compromise approach: My long interconnects are microphone cables (twisted-pair plus shield) with the shield connected to ground at the pre-amp end.

My prejudice against speaker cables grew out of an experience where their effect was anything but subtle. I was living in a neighborhood with a lot of radio activity—a shortwave ham set upstairs, an illegally overpowered citizen's band transmitter across the street, other CB enthusiasts down the street, and a major commercial AM radio station about two miles away. Two audio manufacturers used my living room (plus a location near an airport) to test whether their phono preamp designs were adequately resistant to radio-frequency interference.

In most power amplifiers a negative-feedback loop runs from the output transistors back to the driver or input circuit. If a signal is injected into the amplifier's output terminals, this feedback loop will mix it with the input signal, whence it will be amplified. Speaker cables—long, usually unshielded, fairly straight wires—make excellent antennas, picking up radio signals and coupling them into an amplifier's feedback loop. That happened in my system; Mozart serenades were accompanied by tinny voices and switching clicks. Different speaker cables didn't help. Wrapping aluminum foil around the speaker wires to shield them, and grounding the foil, helped some but not enough. The cure was to put the amp near the speakers and use very short wires.

As time goes by, the air around us grows more and more crowded with RF signals. The FCC has authorized a new class of local-area UHF TV channels, and applications are flooding in. Cellular car phones transmit and receive at UHF frequencies. Every cordless telephone uses radio transmitters to communicate between the handset and the base unit. (Conversations involving a cordless phone are not private; they can be heard up to a mile away by hobbyists with radios tuned to the appropriate frequencies, or across the street if your neighbor's cordless phone happens to operate at the same frequency as yours.) Digital signals, whether used for digital audio, digital spe-

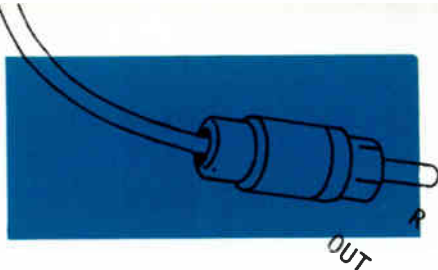
cial effects in new TV sets, or remote control (for example, X10 controllers and the new EIA "home bus" automation systems that put control signals onto house wiring) involve MHz-frequency squarewaves that spray radio-frequency harmonics around the house. RF interference is also generated by older, cruder appliances such as electric drills.

You may think you're in a benign radio-frequency environment, but your unshielded speaker wires could still be functioning as antennas, coupling RF interference into your amplifier. You'll get obvious sounds in the speakers only if the RF signal is "detected" (demodulated) in the amplifier. Even if it is not, the RF signal itself can silently and sneakily drive circuits into slew-rate limiting and other subtle distortions. When I read about comparisons in which a high-capacitance speaker cable sounded better than a low-capacitance wire, or a no-feedback amp sounded better than a high-feedback design, or a tube amp sounded better than a solid-state amp, I often wonder whether differing susceptibilities to RF interference might have affected the comparison. And when a customer chooses a particular type of speaker wire because of an apparent sonic difference in the store, I wonder whether the same difference would be perceived at home where the RF environment is different.

The direct-connect, no-cable method of marrying amplifiers to speakers may not be a panacea, but it provides great insurance against RF interference, and I don't lie awake nights wondering whether expensive cables might make my system sound better.

USA: John Atkinson

Both Peter Mitchell and I commented favorably in the January issue on the fact that, following the presentation of a paper at the November AES Convention outlining how it works, Finial would be starting production of their unique laser LP player in late '88. Well, our enthusiasm was premature. A press release dated 12/29/88 stated that, following the initial production run, Finial had decided that the player was too expensive to produce and had abandoned the project, dismissing the relevant staff. Apparently, they are prepared to license the technology to interested parties, but otherwise the laser turntable is dead.



UK: Ken Kessler

What never ceased to amaze me until very recently was how the British insisted on the production of dull-looking, bizarre, or frumpy hi-fi equipment. This is, after all, the country which offered the world such aesthetically perfect creations as the XK-120 and E-Type Jaguars, the original Lotus Elite, Turnbull and Asser shirts, Turner watercolors, half of the Concorde, Joanna Lumley, and countless other visual delights. So why is every stunner like the Meridian 207 CD player or the Quad '63 or the SME V or the Mitchell Gyrodeck countered by grotesques I won't name because of libel laws?

It must have something to do with the British fear of conspicuous consumption, a dizzy socialist belief that making something look awful will render it non-materialist. It's the only reason I can come up with for some of the truly hideous Rolls-Royces and Daimlers which pepper my back issues of *Classic Car*, but why hi-fi? After all, hi-fi is not something—like clothing or a car or jewelry—you take out of the home to establish your public image. And amusingly enough, the British are among the most clothes-conscious people I've ever met, which rather conflicts with the notion that looking prosperous or stylish is equivalent to bad taste.

But—thank you, Mrs. Thatcher—things are changing, and nothing made this more evident than a visit to a recent hi-fi show in Munich sponsored by top retailer Hi-Fi Team. The last time I was at a German hi-fi show, a couple of years back in Frankfurt, all I heard about was how awful British hi-fi was and why the German market would never accept it. One importer of a particularly popular British amplifier went to great lengths at that time to show me how the gap between the top-plate and the sides varied from 1mm to 2mm from left to right, and that this was not acceptable. All I had to do was compare the lost-in-the-1960s styling and made-in-a-shed construction of the UK products with the carved-from-solid Bauhaus look and feel of the German offerings.

So what do I find in Munich? The show is

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have in common?



aragon

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Stereophile Magazine December 1987, Thomas J. Norton

Hi-Fi News & Record Reviews June 1988, Ken Kessler

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Excerpted from reviews by James Jarvis from the *SENSIBLE SOUND*.

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65% British, and I'm hearing nothing but praise for the efforts of SME, Naim, TDL, Voyd, Helius, Beard, and a host of other brands. Admittedly, few of the British products could match the machined perfection of the Transrotor (Germany), or the elegant stylings of the Sonus Faber speakers and electronics (Italy), but it was no longer a case of Plain Jane Armstrong-Siddeley *vs* sleek BMW. Everywhere I looked there were British goods on display, and no-one was making apologies.

Take Musical Fidelity, for example. The (static) display consisted of pretty much everything that the company makes, but my eye was drawn to the overkill aspect of an upended A470 power amplifier. This beast could easily be mistaken for a high-end powerhouse of the US persuasion, and the lid-off view elicited whatever is the German equivalent of a low whistle. Throughout the display were gorgeous faceplates in brushed black, worthy of a Mark Levinson or Classe, and about as far removed from Nextel-covered orange-and-cream Sugdens (honest!) as you could get. Which leads me to that very make.

Sugden is so low-profile in the UK that most people here think that they no longer exist. What do I see in Munich? Nothing less than a comprehensive range of nicely made, tastefully attired amplifiers slugging it out with far more familiar British brands like Naim and Creek. As if to rub one's nose in it, I saw another UK product which the British can't buy—the Moth turntable.

Now this really is an interesting little number; its story makes me think of those glorious Depression-era films where the underdog wins in the end. A few years back, there was a good (if shoddily made) basic turntable called the Oak. Dirt-cheap, it should have knocked the Dual 505 out of the arena, but quality control was nonexistent. The company folded and Moth Marketing picked up the remnants. Re-working it into something viable, Moth has produced a similar two-speed belt-drive player, retaining the MDF (Meditate) platter, adding a novel "split plinth," and securing OEM supplies of the hottest budget arm on Earth, the Rega RB250. Obviously Moth—like Sugden—is too clever to sell their product in a land full of emotionally unstable reviewers, having recognized that the grass (and the *gelt*) is greener on the other side of the Channel.

So what do I witness in Munich? There are

distributors fighting over the Moth, because there's an apparent shortage of turntables in its price sector for the coterie of German analog supporters. I found this odd, considering that there's no shortage of Thorenses and Rega has a healthy presence, too, but I'm not one to argue with native experts.

The secret of the success of British products in the very fussy German market isn't entirely due to the British. True, they've started to think globally, admitting that there are more customers to address than the archetypal British hi-fi looney who will put up with shoddy workmanship. The products have improved so drastically over the past five years that observers in Munich would have been forgiven for thinking that the goods weren't imported. But the real key to this success is the attitude of the German distributors, each of whom appeared to do a better job with his wares than the parent companies do at home or abroad.

For one thing, the displays—static or active, small or large—were immaculate, shaming most of what I've seen at the various CESes and Penta shows I've attended. These people made efforts above and beyond the usual "throw a cloth over a table" presentations I've come to know and loathe. They acted like they really wanted the public to be enticed by their products. They were hospitable and helpful. And oh-so-patient. And the active demonstrations were enough to undermine any arguments about the worth of trying to hear equipment at shows. Indeed, the Naim distributor gave me a better demonstration than I heard at the factory back in England, while TDL's distributor was so keen that he's created unique-to-Germany cabinets.

This stuck with me when I returned to the UK, and I could only shake my head in remorse. The UK is filled with manufacturers who go on and on about exports, about attacking the global market, yet here were foreign distributors flying the flag to greater effect than could even the BBC. Only one British manufacturer even bothered to send a representative. (Round-trip ticket and hotel cost for the weekend would have been under \$525.)

It's that old thing about something selling despite the best efforts of the manufacturer to ensure the opposite. I'm not talking about limited numbers running out; rather, it's the still-typical, half-baked support or failure to supply goods, or the stubbornness which has



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manufacturers *not* making what the customer wants. It's only after enough people yell loudly (or when financial disaster looms) that companies will change from separate left/right volume controls to dual-mono pots, or go from some totally nonstandard width to 430mm (17") so you can match your British amp with the Japanese cassette deck that the domestic company can't supply.

Which leads me to a shining example of what will eventually put affordable British hi-fi back on the map. I'm not particularly crazy about small integrated amps—life's too short to listen to less than a kilowatt—but they are the lifeblood of the UK scene on every level. They keep impoverished audiophiles from going without hi-fi, they keep the retailers' tills ringing during the silences between high-end sales, and they keep the manufacturers busy. And none can match A&R Cambridge for sheer consistency and a willingness to adapt to real-world—as opposed to hi-fi lunatic—demands and still retain tweak credibility.

Keep in mind that this is a company founded on a rather dull but unbelievably reliable little amp called the A60, a unit which sold in the tens of thousands over the past decade—plus to “audiophiles” on a budget. Upon realizing that they'd virtually saturated this captive, magazine-reading sector, the company did something which would have been considered heresy in the days of Linn/Naim mania. They had their products rationalized and professionally restyled. The miracle was that they did this in such a way that their products could intermingle with Japanese brands—people have to buy cassette decks from *somebody*—while still having a unique, non-oriental look.

Think about it: It's not easy to produce a black box with knobs selling for under \$200 which doesn't look like everyone else's. So somehow Arcam products were endowed with looks which are familiar yet different. (And, as if to prove me wrong, the company stuck with a swing-the-dial analog tuner, the Alpha, just to let you know that the fancy clothes can't hide a stubborn Anglo streak.)

When I returned from Munich, I had an A&R press release waiting for me which attested to their taking the final step. Within days of the announcement that the company's Alpha integrated amplifier and tuner had won the coveted *What Hi-Fi?* Awards for 1988 in their respective classes, A&R introduced Series 2 ver-



Arcam Alpha Integrated Stereo Amplifier and AM/FM Stereo Tuner.

sions which—are you ready?—actually measure 430mm wide, just like 90% of the rest of the products sold around the globe. This may seem like a minor point, but remember that companies like Linn couldn't even agree to produce a matching preamp and power amp of identical widths, while Quad matches nothing on Earth other than an obsolete Meridian CD player, Naim only stacks with Naim, Inca Tech with Inca Tech, and so on. And if you know anything about selling affordable products, then you'll know that the mass-market purchaser does not want a system which looks like a patchwork quilt. You could argue that Naim, Linn, Quad, and the rest are only using B&O tactics, in which the customer has to buy the same make for aesthetic balance, but these companies do not—unlike B&O, Revox, or the Japanese—offer complete systems. After amps and preamps, they may cook up a tuner, perhaps a CD player, but never a cassette deck or VCR.

Which is why the Japanese, with their one-make systems from tape to CD to tuner to DAT to VCR, own the non-tweak market. Those of us who indulge in specialist or high-end systems expect to buy each item from a different maker, thinking nothing of putting a big, black Nakamichi Dragon next to a champagne Marantz CD player feeding a silver Audio Research preamp driving gunmetal Krells. So when a non-magazine-reading hi-fi customer pops into a British hi-fi shop wanting a no-muss, no-fuss system that won't upset his spouse, he can gleefully buy British—A&R—and still add a cassette deck without starting a domestic fracas.

One small step for mankind, one giant step for British audio. Now, what will it take to prove to the British hi-fi “Green” movement that sculpted wooden faceplates will limit the appeal of their preamps?

Shut your mouth, Kessler. You raved about Sonus Faber in the fourth paragraph. **S**

Here's the current list of exhibitors and manufacturers displaying and demonstrating at the Bay Area High End HI-FI show.

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JOHN ATKINSON TALKS WITH LOUDSPEAKER DESIGNER ROBIN MARSHALL

One of the things that fascinates me about the field of box loudspeaker design is how few original talents there are capable of designing a model from first principles. Yes, armed with the Thiele-Small papers on bass alignment, an understanding of filter theory, and a working knowledge of the OEM drive-unit field, almost anyone can, and has, come up with one commercially and sonically successful design—given a fair degree of luck. And the teams of well-trained engineers at companies like KEF, B&W, and Celestion have shown that they can produce a steady stream of affordable boxes with a high ratio of performance for the dollar. But for an individual to create more than just one good box speaker requires a modicum of genius, and genius is thin on the ground.

I would put forward the names of Jim Thiel, Kevin Voecks, John Bau, and Richard Vandersteen as examples of creative US designers who can produce a succession of dynamic loudspeakers that rise above the merely excellent. In the UK, Proac's Stuart Tyler, Martin Collops, Richard Ross of Rogers, Phil Ward, once with Mordaunt Short, and Robin Marshall have all proved that they have the ability to square the acoustic circle on a consistently good basis.

Robin Marshall, the last-named, seems to be on the crest of a wave at present. After spending the '70s designing good-sounding budget models to be sold under the Audiomaster brand for the British retailer KJ Leisuresound, he blossomed in the '80s, producing a number of sonically stunning speakers for Monitor Audio, including the R352, R852/MD, and R952/MD, which respectively impressed me, Tom Norton, and the Audio Cheapskate in 1988; set up his own company, Epos Acoustics, to manufacture another of his designs, the ES-14, another Cheapskate favorite; and recently became chief engineer at Mor-

A MODICUM OF

GENIUS

daunt-Short. I met with Robin at the 1988 Chicago CES and asked him what had prepared him for a life at the sharp point of creative speaker design:

RM: I was with the BBC, though not so much on loudspeaker design. If you ask an engineering graduate where he wants to go, how's he going to know? He doesn't know what the options are. The BBC therefore has a system where you can spend a short amount of time in every area of the BBC's engineering section. You could spend some time at Broadcasting House in the studio, you could then go to the design department and do a little bit, you could go to the equipment department and build things. This is a two-year contract they have. And then at the end of that, you choose which area you feel is most suited to you.

JA: *So an engineer entering the BBC from university would find himself very quickly acquiring a broad-based experience both behind the mixing console and in R&D.*

RM: And if he can work in all those options, he may discover something he's never ever thought about doing.

JA: *How did you evolve from being a general BBC engineer to being a loudspeaker designer?*

RM: I didn't feel any specific interest in loudspeakers when I went to the BBC. I didn't actually know *what* I wanted to do. I had studied mathematics and computer science; I considered myself a mathematician. Yet once I got into the engineering section, I realized hands-on engineering was really what I enjoyed doing most. I'm the kind of guy who likes to have a soldering iron in his hand rather than a calculator. I did a little bit of work at the BBC on acoustics and on loudspeaker design and got a fair grounding on the theory of the thing.

JA: *Did you work with any of the classic BBC speaker designs?*

RM: Oh yes—every BBC engineer does. What I *wouldn't* like to say is that I was responsible for this, that, or the other. I mean, there are so many people at the BBC who'll get involved in a design, or, in the production engineering side of the design, making a design happen. I was involved in quite a number of speakers, including the LS3/5A, but I wouldn't claim that I made any real contribution to it.

I left the BBC in 1972 or '73. The politics within the BBC are very curious. While I was there, you didn't get promotion on merit. You

I was the worst salesman they had ever had because I told customers what was wrong with the equipment.

got promotion on whether your face fit, on whether you were standing in the right place at the right time. Also, perhaps I've matured a little bit now, but in the past I was a very forthright person, I tended to speak first, think later. That didn't go down too well a number of times, and I didn't feel I was making any progress. Though I'm not a high-profile person, I do like to have *some* profile. I don't like to be faceless.

I was dabbling in a career in the music business at that stage, dabbling and doing session work. I'm basically a frustrated musician. I always wanted to be a musician but could never quite make it.

JA: *What instrument did you play?*

RM: Bass, electric bass—like you.

JA: *There are a lot of ex-bass-players in the hi-fi industry.*

RM: I tried for a long time to make a living at playing the bass—and came very near to starving. So I went to work for a hi-fi retailer in London, called Hampstead Hi-Fi, who now no longer exists. They told me I was the worst salesman they had ever had because I told customers what was wrong with the equipment. I was then given a job by KJ Leisuresound who were quite easygoing. John Read, who owned KJ, wanted to get involved in making loudspeakers, so by pure accident I ended up effectively starting Audiomaster for him.

JA: *I'm sure that it didn't hinder Audiomaster's progress that they had a license to manufacture the LS3/5A. . .*

RM: That happened in a strange way, because at that time *ca* 1975 the original Rogers company ceased to exist for a while before being resurrected by the Swisstone company. So as nobody else was manufacturing the LS3/5A, and as there was a ready market for the speaker, I suggested to John that it would be comparatively easy to get the license because of my background in the BBC. And of course that gave Audiomaster its start.

JA: *What happened to Audiomaster? The speakers sounded good, you had the backing of a good retail chain. . .*

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RM: Audiomaster ceased for a number of reasons. I think perhaps—with due regard to John Read's abilities—he chose some wrong people to manage the company. When Audiomaster began to grow, it became obvious that I couldn't be everything, I couldn't be the designer, the ad manager, the sales manager, the production manager. So the company had to take on other people to do that. I think John made a bad decision—took on a sales manager who took the company in a funny direction, expanded it a bit too quickly. Basically, like so many other companies, I suppose Audiomaster grew at too great a rate. We couldn't sustain that growth. The money wasn't there. The growth rate ran away with itself.

JA: *You ended up selling plenty of loudspeakers but not making any money.*

RM: That's right.

JA: *That was in about 1981? Did you start Epos immediately?*

RM: No. Again, I've been lucky all my life in these things; when Audiomaster eventually folded, Mo Iqbal of Monitor Audio very kindly offered me a job instantly. Mo was the only person who put his money where his mouth was. Many people came to me and said "We understand that you're going from Audiomaster; you know, we could really use you for something." But they never made any firm offers. Then Mo came along and said "Do you want a job? How much do you want?" He clinched the deal in moments. Mo's a great guy for making decisions.

JA: *What was the first model you designed for Monitor Audio?*

RM: The MA R352 and R252 came out simultaneously. They were done at the same time, as well as another model called the 152, which was done against my judgment. It was a model that Mo specifically wanted, and which I think was an overwhelming disaster.

JA: *But the '352 turned out to be a best-seller in the UK.*

RM: I think the '352 helped to reestablish Monitor Audio as a name.

JA: *It was somewhat unconventional for an inexpensive speaker in that it had a large box.*

RM: It was a mold-breaker. I looked around at what people were doing, and it seemed pointless to just make another clone—you know, here's our version of the standard loudspeaker at this price point . . .

JA: . . . *with a plastic-cone 8" woofer and 1" soft-dome tweeter in a relatively small box.*

RM: I decided to go in a different way all together. And, you know, I think it was good that Mo gave me the complete freedom to do that. He didn't put any constraints on me doing things. He didn't say, "Hmm, I'm not sure about that." He was prepared to let me just have a completely free hand, finish the design, and then he would go out and sell it. Fortunately it all worked.

It lasted two years. I left Mo to start Epos (though I went back to work for Mo for a week after my own company had been floated; I'd already agreed to do the SIM show in Milan for him in June '83). There was no animosity of any kind in that split. Mo and I were then, and we remain, I hope, good friends.

I'm very interested in transducers as a whole.

I wanted to design more than simply mass-market hi-fi product. I wanted to get involved in other aspects of design. I'm very interested in transducers as a whole, *particularly* in drive-units for musical instrument use. That's an area I'm very interested in. So I set up, or I had my partner set up, the company really to do engineering consultancy. We didn't really set up to make hi-fi loudspeakers. That came later. I did some work for a company on some drive-units for active noise control, as it happens.

JA: *This is where you blast a sound source with antiphase noise from a computer, and the computer then continually remodels the noise spectrum to try to reduce the overall level?*

RM: Yes. It puts considerable restraints on the drive-unit technology because the drive-unit has to have phenomenal bandwidth and phase-response control to work. If the phase response starts to go out the window, then you've no longer got anti-noise.

JA: *You did come out with a domestic loudspeaker design fairly quickly, I believe, the Epos ES-20 being launched at the 1984 Heathrow Penta Show. Almost uniquely for a new loudspeaker company, you manufactured your own drive-units, including a metal-dome tweeter.*

RM: Up till that point, I don't think anybody else other than Celestion used one. And it was the first of the current generation of metal-dome tweeters to make the dome out of alumi-

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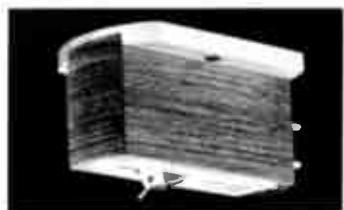
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num. I remember quite distinctly that somebody from Celestion told me that it would never work because the aluminum would suffer metal fatigue inside 10 seconds, and would fall to pieces. I always find it slightly amusing that not very long afterwards, Celestion made an aluminum-dome tweeter—I went and told them the same thing.

JA: *I assume that maybe they'd had some disastrous early experiments.*

RM: I think it was more because when they launched the SL6, they didn't know whether metal domes were going to be commercially acceptable. The tooling costs to make an aluminum-dome tweeter would have been perhaps too high for a speaker that was just going to tread the waters. The SL6 copper-dome tweeter was electro-deposited copper. There were no tooling costs really, you just make some cheap mandrels to do it on; it's a zero-investment technique. But they did start people like me thinking, "Hmm, maybe *this* is the way to go." Celestion should take credit for that.

JA: *You're probably aware that metal-dome tweeters are controversial here in the USA, with many designers feeling that their advantages are only obtained at the expense of problems elsewhere. What are the specific reasons you chose to use them?*

RM: Let me first of all say that I'm beginning increasingly to think that dome tweeters might *not* be the best way of doing things. I'm beginning to think more and more that, should we not be looking at *cone* rather than dome tweeters? But having decided that you're going to make a dome tweeter, you want at least to keep the diaphragm bending modes out of the audio passband. And there is no other material, no usable material, other than a metal, where that is possible. You could probably make a tweeter diaphragm out of ceramic, which would be, perhaps, quite wonderful, but the prospect of making it is daunting.¹

The first bending mode of the dome, even an aluminum dome, is not what most people think. Most people say, "Here's our aluminum-dome tweeter, the first bending mode is at 23kHz." Not so. That's the *second* bending mode. The first bending mode is maybe at 200Hz. It's the second bending mode that's *bothering* them, which perhaps is at 23kHz.

I'm beginning increasingly to think that dome tweeters might *not* be the best way of doing things.

This is usually an oilcan mode, when the middle of the dome is going backwards while the outer edges of the dome are going forwards. It's not a rocking mode, which is not so much due to the dome—and whatever you make the dome out of—but is due to a suspension problem.

The first bending mode is when the outer edges just slightly begin to tip up. This is widely known. Don Barlowe, who is seriously underrated by I think almost everybody,² has already written a number of papers about this. He described, in a paper on dome radiators he gave to the 50th AES Convention in London, the first bending mode as being low down.

JA: *You say that you think a cone tweeter might be a better way of going about it?*

RM: Yes I do. Because when a dome goes into breakup, it's utterly, totally finished. Uncontrollable. That's it. There's nothing more to be had. When a *cone* goes into breakup, all that's happening, providing you can control it, is that the radiating area is diminishing. It's much easier to control that. There's a lot of work to do, of course. I wouldn't like to say that you can just take a sheet of paper and design a cone tweeter which is going to be a world-beater. But I'm sure there's a lot of scope. I shouldn't say this, should I? I should just go out and do it.

JA: *But can't you add damping to control the dome breakup, or use a material which has high intrinsic damping?*

RM: Yes, but the damping makes things worse. You look at a soft-dome's frequency response—and that's how most people judge a tweeter—and if it's nice and flat, it's wonderful, isn't it? What it's *not* telling you is that the first worying resonance, the second resonance, may be at 6kHz. It's heavily damped, it's very low-Q, but that means it's actually worse than if it's an aluminum dome. If you looked at it in the old-fashioned way of judging hi-fi in the 1970s and early 1980s, a low-Q resonance is great because

¹ I remember Kenwood launching a range of speakers in Japan that used sintered alumina tweeters, but I have no idea what happened to them.

—JA

² Don Barlowe designed the Leak Sandwich cone, then went on to Rank Wharfedale's research department. He did a lot of very good work on groove deformation in gramophone records, writing a really far-ranging paper on that subject. A wonderful engineer.

—RM

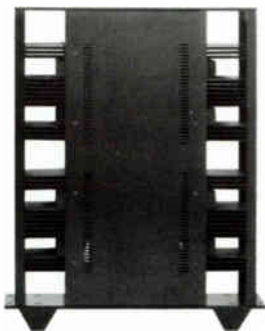
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you can't see it. But a low-Q resonance is far more worrying than a high-Q resonance.

JA: *Peter Fryer in the '70s (now with B&W), and now Floyd Toole at the NRC in Canada, have done work that indicates that low-Q resonances will be more audible than those of high-Q.*

RM: Yes, Floyd Toole says that a high-Q resonance x dB down won't be as audible as a low-Q resonance much, much further down, two times x dB down. There's a lot of engineers, of course, who work purely on theory, on "Let's measure it. Listening? Oh, I've heard of that, but you know, how do you actually *do* that?" I think Peter Fryer did a lot of good work to begin with on resonances. And every engineer involved in audio, for God knows how long, has always said the best way to treat resonances is to damp them like anything; you know, make them very low-Q. Peter Fryer at least had the courage to say, "Mmm, not so." And then provided evidence to prove that wasn't the case.

JA: *A low-Q peak may not be nearly as high in amplitude, but there's a larger area under the curve. And you can hear it.*

RM: Oh yes! That's where soft domes fall down, I think. They spit and sizzle at you, but when you look at the response you think, "I don't understand it. Why?" If you simply think about what the thing's doing, it's obvious, isn't it? This awful resonance in the audio band.

JA: *So what you're saying in effect is that you have to use a stiff dome made from metal or some similarly hard material such as a ceramic. . .*

RM: . . . to take that resonance as high as you can. And then don't attempt to damp it. I suppose in a way Celestion fell into that hole with their copper dome. Didn't they try to damp the resonance electrically?

JA: *They tried to notch out its amplitude peak.*

RM: And they made it sound worse. Most people I think were in agreement that the best thing you could do with an SL6 was to take that kill circuit out. That made it sound so much better.

JA: *I said earlier that you make your own drive-units, including the 26mm dome for the ES-14 and the 32mm for the old '20. I've always been told that tweeter manufacture is fraught with problems because of the very close tolerances required on something so small. You went into that. . .*

RM: Foolishly.

JA: *Did it take you a long time to get a good tweeter into production?*

RM: No, not really, because it's just an engineering problem. There's nothing difficult really about it. The only difficulty in making a tweeter is that all the masses are so low you've got to be very careful with adhesive bonding to make sure you're not changing the masses of things and introducing compliances. It's only an engineering problem. There's nothing difficult in licking that, providing you have the experience and the resources to do it. I think most people are scared off unnecessarily. Most manufacturers say "Well, we can make a bass driver, but a tweeter, hmm, no." They've never tried it.

JA: *Is there anything special about the ES-14 woofer?*

RM: There's a lot special. It's a back-to-front design in that it uses a 17mm-long magnet gap and a 5mm-long coil as opposed to the normal system which is a long coil, perhaps 12 to 14mm long, working in a gap 6mm thick. This gives us linearity. It also gives us tremendous thermal stability because the coil is always totally enclosed by a huge amount of steel. Within the limits of sensitivity, you've got no real coil heating to worry about.

The only drawback is that it's *horribly* expensive. A 17mm-thick magnet plate is not exactly a cheap way of making a bass driver. The magnet system in our bass driver costs *double* the price of a complete bass driver in most loudspeakers. We pay \$20 for the pieces in the magnet system. The average OEM 8" bass driver might be costing its manufacturer \$10 or \$12. Total, finished. Just stuff it in the box and there you are. So it's a masochistic way to make loudspeakers.

JA: *A loudspeaker is more than the sum of its drive-units, however. You have to pay very careful attention to what the box is doing.*

RM: Yes, a lot of care goes into the box. It's strange, though, the ES-14 box is relatively conventional. I did so much messing around with different materials, different structures of boxes, so many exotic ways of making a box, but eventually came back to the conclusion that the best way of making a box was the good old conventional way—wood, nothing fancy about it. The only thing I do which is remotely different, I suppose, is to have a metal tie rod across the box.

JA: *One cabinet, two drive-units, you still need a crossover. Traditional British thinking*

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has been that you aim for as much out-of-band rejection as possible. You use quite high slopes—18, 24dB/octave—and end up with very complicated crossovers like that in the LS3/5A. For some time, however, you've advocated that the less complex the crossover, the better. Why is that?

RM: I don't believe at all in the "let's get rid of the drive-unit as quickly as we possibly can" approach. Because if you're crossing over from a large unit into a small one, you've got a radiation pattern change straightaway. If you get this business where they're both rolling off extremely steeply so you've got a very fast change between two quite different polar patterns, that's very noticeable. The coloration generated by the off-axis performance of the speaker is going to be very noticeable. On-axis, it may measure as flat as a pancake; in theory, if you could listen to the speaker in an anechoic chamber, it might sound great. But once you put it into a real live room it's going to sound awful.

The woofer is very directional at the crossover frequency, while the tweeter is almost omnidirectional. You've got that horrible, sudden transition. So if you can spread the transition between the two drive-units over a larger part of the bandwidth by using gentle-slope crossover filters, you can fudge it, I suppose is the best term.

JA: *You would agree then with Floyd Toole's findings that, off-axis, you need a controlled dispersion across the band, with no sharp discontinuities at any frequency?*

RM: Yes, absolutely. However, what you also get with gentle-slope crossovers is that when you start to measure the box, you can find all sorts of problems, particularly when you move your microphone in the vertical axis. You get nulls which can look fairly horrific. And if you choose to, you can get measurements of the box which can prove beyond a shadow of a doubt that it is a piece of junk.

JA: *But these nulls are due to cancellations between the radiation from the two drivers having different path lengths specific to that point in space, not to an actual lack of energy at that frequency.*

RM: It's a totally false problem. But you tell that to the measurement-oriented people who say, "Oh, look at this cancellation."

JA: *First-order, 6dB/octave-slope crossovers have always been popular in America. First,*

they are time-coherent. Second, they avoid the necessity of having to wire the tweeter 180° out of phase to get rid of the cancellation notch at crossover with 12dB/octave slopes.

RM: Third, they are bloody cheap!

JA: *What would be your reasons for using simple, low-order crossovers?*

RM: The ones we've just talked about, the polar response changes, also the transient response of a first-order network. If you've got to have a roll-out, then choose the gentlest one so you don't upset the time-domain response too much. A first-order network is the only network where you haven't got any time-domain problems. There is no other, although people are always developing trick networks, aren't they? You know, "We really licked the problem here, this is really it." And some of the stuff that people like Stanley Lipshitz have come up with, they claim to have overcome these problems, but they never sound any good to me.

That's always the final arbiter to me. I don't give a pat what the theory is; if I listen to it and it sounds awful, then it's not working, whatever the theory tells me. Like I said at the beginning, since my education was in mathematics I'm not ignorant of the theory, but a lot of people accuse people like me, people who trust their ears sometimes more than the theory, saying "Oh well, that's only because he's such an ignorant bugger, you know."

JA: *You've gone beyond just using low-order crossover slopes in the '14. There actually is no low-pass filter in the bass-unit path. Doesn't that put severe constraints on the drive-unit?*

RM: Yes. It means that I have to design the bass driver to perform its own roll-out slope. Again, there's nothing new, no magic about doing that. It's purely an engineering problem. By adjusting the various masses of the components, you can put the roll-out slope wherever you want it. Of course, you can't make the woofer roll out at 6dB/octave. By its very nature it wants to roll out at 12dB/octave. All you can do is make the roll-out slope very low-Q at the very early part of its roll-out, so it looks like a 6dB/octave slope to begin with.

JA: *It achieves its final 12dB/octave dive when you're an octave or so further up?*

RM: And then, of course, it's going into total, uncontrolled breakup beyond that, and the roll-out is God knows what. All you can do is to try to engineer all those things as far away

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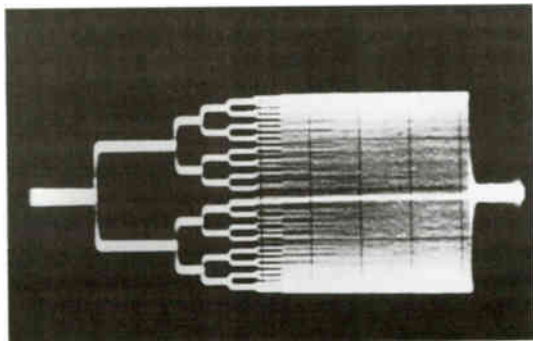


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from the passband as possible so that they don't matter. In reality, of course, they do matter. I mean, any resonance is audible; even a resonance 30dB down will still be audible. It hasn't gone away because you can't see it on the measurement.

JA: *A final question: you obviously think it important that anyone involved in designing bi-fi components should have some contact with the real thing. You yourself are a musician. How do you go about organizing your listening so that you know that you're picking up things which are real?*

RM: I don't make any attempt to really. The only way I discipline myself is to make sure that I listen to an awful lot of real music, both serious music and fun music, like jazz. I listen to all kinds of music. And I do that in a lot of live

environments. I don't do it as a chore, I do it because I enjoy doing it! And when I listen to equipment, I listen to it in the same way that I'd listen to a live concert. I don't go to a live concert and start analyzing it, saying, "Hmm, the highs are a bit gritty." I sit down and take in the overall sound and say, "Am I enjoying listening to it? Is this moving me? Is it doing things for me?"

Too many people, particularly when they go to buy hi-fi equipment, are so on edge listening, trying to pick out certain parts of the system's performance, that they never take in the whole! That's what's important. That's what music is about.

There's a question I think your readers should always ask themselves when they sit down to listen: "Am I enjoying this?" **S**

AUDIOPHILE QUIZ:

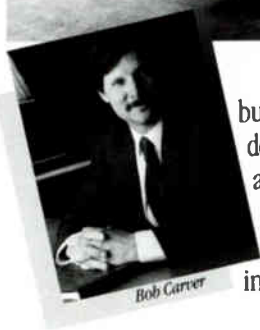
Q: *How many manufacturers have had products concurrently listed in every major category (sources, preamplifiers, amplifiers, speakers) of Stereophile Magazine's RECOMMENDED COMPONENTS list?*

A: *Only one.*

Q: *What manufacturer consistently produces musically accurate components to suit a wide range of applications and budgets?*

A: *Conrad-johnson design, inc., engineering and producing conrad-johnson vacuum tube electronics, Motif solid-state electronics, Sonographe audio systems, and Synthesis dynamic loudspeakers.*

What's A Transfer

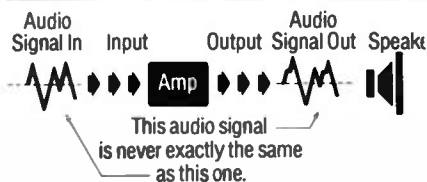


Good question, but before I get deeply into the answer, let me tell you a little bit about amplifiers in general.

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.

Most modern amplifiers change and modify the audio signal very little, but all do it, and the subtle changes, different in each

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



The TRANSFER FUNCTION is simply the scientific expression of the exact way the audio signal is changed as it passes through. If you know the transfer function, and if you can give that same transfer function to ten different amplifier designs, they will all sound the same.

Powerful

Musica

Function?

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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Bob Carver

P.S. If you'd like to know more about my transfer functions, write to Carver Corporation, in care of me, at P. O. Box 1237, Lynnwood, WA 98046.

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Accurate



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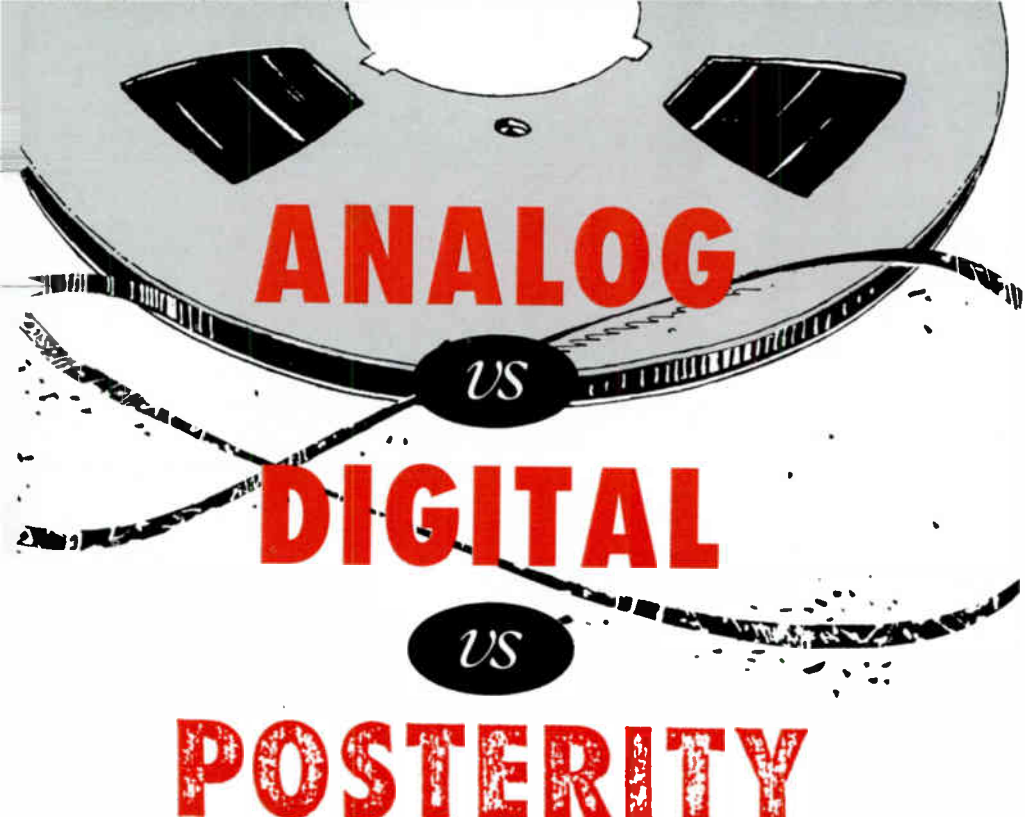
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ANALOG
US
DIGITAL
US
POSTERITY

George M. Graves II

It is one of the ironies of modern times that, just as audio recording techniques were beginning to mature in the middle 1950s, we started to lose this century's greatest conductors. Wilhelm Furtwangler died just as magnetic recording was getting started, and Toscanini retired (for health reasons) only weeks before he and the mighty NBC Symphony were slated to make their first stereo recording for RCA Victor. As digital recording was getting under way, we lost Eugene Ormandy, Stokowski, and Sir Adrian Boult.

Looking back, they're all gone now: Szell, Reiner, Munch, Walter, Barbirolli, Beecham, and many, many more. Don't misunderstand me—it's not that today's conductors are bad; we have many good modern conductors. But who, today, has the personal insight into the music of Richard Strauss enjoyed by Fritz Reiner? Who knows the musical intent of Ralph Vaughan Williams or Gustav Holst [*or Elgar—Ed.*]

as well as did Adrian Boult? Has anyone else ever understood the intricacies of Gustav Mahler like Bruno Walter? These men were friends of these composers, and often premiered their works.

But wait—what am I lamenting for? We still have many of these great performances saved for posterity, many in stereo. They're all locked away in the vaults of the great record companies, safe from the ravages of time and the whims of public taste. Or are they?

Posterity & the Analog-Digital Debate

I recently had quite a shock—my trusty Sony 880 professional reel-to-reel tape deck had to go to the shop. The thing would no longer spool my 10½" master tapes. Since these tapes are stored tails-out, they have to be rewound before being played. Halfway through the re-

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wind or fast-forward mode, the reels would gradually slow down and stop. After many unsuccessful tries to fix the thing, the technician asked me to bring one of my master tapes to his shop. Now, all of these recordings were made on Ampex 407 tape, from roughly 10 years ago—definitely professional-grade tape. I left one of my masters (reluctantly) with the technician, and when he finally called back, it was to tell me that this tape was falling apart. The black backing Ampex put on this tape to improve friction between the pinch roller and capstan was coming off, as was the oxide. This gooey mess was gumming up the tape path, causing the aforementioned spooling problems.

I was, to say the least, horrified. These tapes are irreplaceable, and, as far as I'm concerned, priceless. To hear that professional tape was self-destructing after only 10 years was almost inconceivable to me. I immediately started to transfer these tapes to DAT while they were still playable at all. While doing so, a great truth started to dawn upon me: analog isn't forever. As inherently good-sounding a medium as analog tape is, its archival properties are very poor.

While I don't pretend that my storage techniques are optimal, these tapes have nonetheless been stored under better conditions than are available to many people. I live in a part of California where the humidity is fairly low (45–65% year-round), the temperature fairly constant. I have also kept these tapes inside, away from heaters, and in a home which is heated to 70° in winter, and cooled by air conditioning to 70° in summer (when necessary). If these aren't exactly optimal storage conditions for magnetic tape, they're hardly what one would call adverse. The point is, if my storage conditions can ruin a magnetic tape in 10 years, real archival conditions could only extend that time for—what? 10, 20 years? If so, what then? Do we lose everything that has not been already transferred to digital tape for CD reissue? I'm afraid so. Let's look at some facts.

Have you ever listened to a record and heard the faint strains of the beginning of the piece before the piece actually began? Well, something akin to that "pre-echo" occurs naturally in analog recorded tape. It's called print-through, and occurs over time because the magnetically recorded particles of oxide on the tape produce minute magnetic fields. As tightly wrapped as are layers of tape on a reel, these tiny fields begin to affect the magnetic particles on the

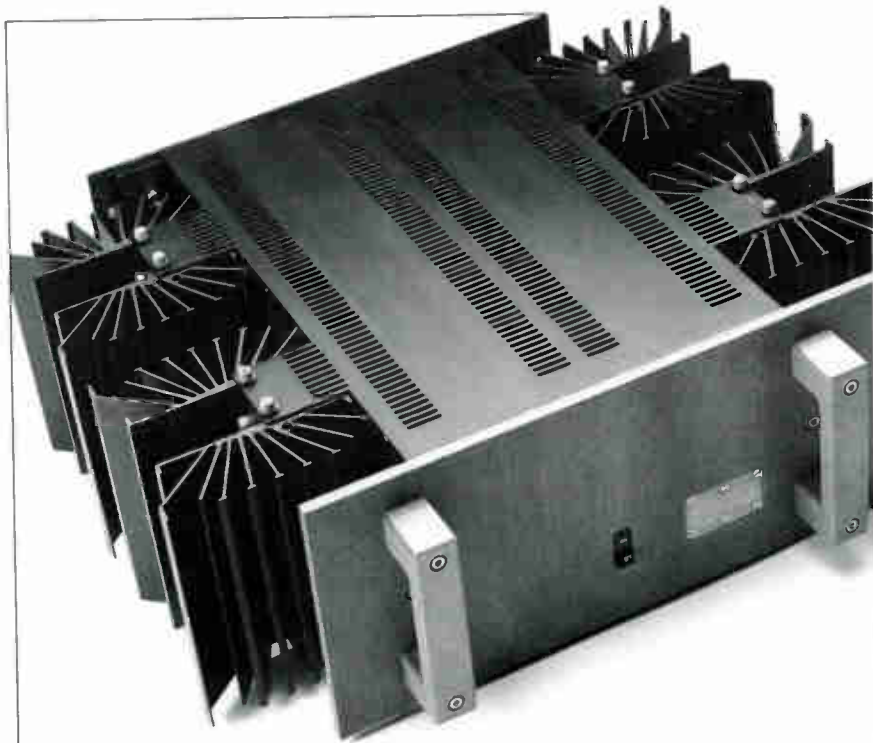
layers of tape above and below them (especially on heavily modulated passages), and, eventually, actually transfer their pattern to the next layer, causing an echo. If the echo falls upon layers of tape which follow the sound when played back, then this print-through is generally masked by the natural or artificial reverberation from the recorded performance, and is of little consequence. If, on the other hand, the echo precedes the actual sound, it sticks out like a sore thumb.

The prevention of print-through is the primary reason for storing magnetic tapes tail-out. Having to rewind the tape before playing assures that the tape will not be stored at the same tension with each play, and that there will be some movement of each layer in relation to other layers on the reel; this reduces the amount of print-through accumulated between plays. Also, some print-through is temporary, and rewinding the tape before playing relaxes the material from its tight-wind storage conditions, allowing some of this temporary print-through to dissipate.

Unfortunately, if magnetic tape bleeds its magnetism from layer to layer over time, it also bleeds it from side to side, dulling transients by increasing the width of the magnetically recorded signal which represents the transient. Another problem with analog tape as a long-term storage medium is that, eventually, the intensity of the recorded signal decreases. This problem, more prevalent in early tape formulations, is especially noticeable on high frequencies. There are several reasons for this phenomenon, among which are the magnetic retentivity characteristics of the oxide itself and the long-term effects of the earth's own magnetic field, which tends to work as a very weak bulk eraser. When tapes are played, built-up residual magnetism on the metal parts of the recorder itself also take their toll on the high frequencies. If you've ever had the feeling that a reissue of a favorite old recording lacks something when compared with the original LP, you're probably right. Here lies at least part of the reason.

We've looked at print-through, bleed, and high-frequency erasure. Though certainly bad enough, these are only the magnetic properties of the tape affected by age. We haven't even begun to talk about magnetic tape's physical properties.

As most readers know, magnetic tape is made



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from a plastic band upon which is deposited a ferric material capable of retaining a magnetic field which represents the recorded signal. This sounds simple, but in reality is anything but. The magnetic material is in the form of a metallic powder ground to a consistency many times finer than even pollen grains. This powder, known as oxide (even though many of today's tape formulations are made from non-oxidized metal), is then mixed with a chemical adhesive or binding agent so that it can literally be painted on to the plastic tape. The resultant coating must be uniform to incredible tolerances, and polished to a mirror finish. When the binding agent dries, it must bind the oxide layer to the tape in such a way that it is as flexible as the tape backing itself, while keeping the oxide fixed to the backing so that it will never shed or flake off. This binder must also remain stable over the life of the tape, so that the tape retains the characteristics for which it was designed.

The plastic tape as well must be designed in such a way as to maintain its characteristics over the years. The plastic must remain flexible and dimensionally stable (not shrink nor stretch). Plastic is susceptible to change by such agents as extremes of heat or cold, air pollution, and the effects of sunlight (mostly from ultraviolet radiation). Any one of these can cause tape to become brittle, or to shrink or stretch. Chemical changes in the tape can cause it to react with the binder in the oxide layer as well, causing the binder to fail, and the oxide to become sticky or to flake off in big globs.

If all of this is true, then what can be done to protect priceless master tapes? In the first place, today's magnetic tapes are pretty darn good. Modern premium-quality tape formulations have few of the aforementioned problems. It is true that most are still susceptible to print-through, bleed, and time/use related erasure, but to a much lesser degree than the formulations of even a decade ago. It is mostly in the area of materials technology that today's professional tapes have been improved. The need to produce quality videotape for the consumer market has brought about great strides in the development of tape backings, oxide formulations, and binders. There is every reason to believe that, with proper storage, today's tapes will maintain their physical characteristics for many decades to come. The magnetic properties of the tape are another story. To keep our priceless masters from deteriorating any fur-

ther, they must be moved from the aging analog tapes on which they reside to other, more permanent media.

I am transferring my decomposing Ampex masters to DAT with remarkable results. When audio signals are in the digital domain, such problems as print-through, bleed, and gradual erasure become nonexistent. It has even been said that a true digital recording, where the stream of ones and zeros are recorded directly to tape (as opposed to being converted to an analog video signal first, then recorded on video tape), is relatively immune to bulk erasure, so powerful is digital's error-correction facility.

Transferring analog masters to digital tape solves some problems and preserves others, as well as creating a couple of new ones. We've already discussed the problems solved by this storage medium, but we are still left with the physical limitations of the tape itself. As good as today's digital tape is, we have no idea how the depleting ozone layer, increased air pollution, and just plain old time are going to affect the stability of the tape. As long as it will move through the transport, we should be able to retrieve a signal as perfect as the one laid down. But if the tape becomes brittle and breaks, we may find that we have lost a priceless recording.

Perhaps tape isn't the answer in either analog or digital form. Perhaps everything should be transmitted optically to laserdisc. Surely that would be the ideal storage medium. The problem is, we just don't know. CDs haven't been around long enough to prove their permanence. Though permanent in theory, laser video discs had a problem with the reflective backing on the disc flaking off (called "laser rot"), and people are reporting the same phenomenon occurring in some early CDs. Most of the industry pooh-poohs these reports, but the fact remains that we just don't know. The ideal answer may still be some years off. If we can ever get solid-state computer memories (in this case ROMs, or Read Only Memories) dense enough to hold an entire master tape on one chip (today's ROMs can hold only a few seconds' worth of CD-quality sound), we may have the ideal storage medium. ROMs require no moving parts to retrieve their stored signals, and, once programmed, are, for all intents and purposes, incorruptible. But at the current rate of IC development, it could be 20 years before this becomes a viable alternative.

I mentioned earlier that transferring analog masters to digital posed a few new problems in addition to the ones we have already discussed. Of the two major issues that I see, one is moral, the other aesthetic. When we make these transfers, do we transfer them as-is, or do we try to fix such things as rolled-off highs due to erasure, and tape hiss? And if we decide that we should clean up these recordings in the process, who makes the decision as to what kind and how much signal processing gets used? My experience, based upon comparison of many old analog recordings which have been transferred to CD with the original analog records, indicates that no attempt should be made to alter these recordings in any way during transfer. If future record producers want to fiddle with the sound for *their* re-releases of this material, let them do so with a digital copy of the transferred master. This way, we will always have the original to refer to.

The second problem is not so cut and dried. Many people just don't like the sound of digital recordings. To them, transferring an old analog master to the digital domain is sacrilege. They have a point. Chances are, we won't stick with 16-bit, 44kHz-sampling-rate digital audio as a standard for very long; technology moves too fast. CD is only five years old, and already the standard is considered outmoded. Some people, like engineer/producer Doug Sax, think that digital, aside from sounding bad, isn't even a good archival storage medium. I spoke with Doug at his Hollywood studio recently, and he told me why he felt this way.

It seems that most professional digital recordings have been made on videotape using $\frac{3}{4}$ " VCRs (U-Matic format) fed by digital processors (such as Sony's 1610 or 1630), which first convert the analog sound from the microphones into a digital bit stream, then convert the bit stream into a TV signal. This works well because the VCR has the ultra-wide bandwidth required for digital audio. The problem is that the video signal which now represents all those ones and zeros is an analog signal, subject to all the vagaries of any videotaped signal. Sax says that many older digital recordings have already deteriorated to the point that it is difficult to play them. Even if a successful dub can be made, the transfer will have many more errors than would normally be considered acceptable. While it is true that many of these errors are concealed, often the processor will

go into full mute. There is nothing that can be done at that point—you have, in essence, a ruined master.

Some formats use direct digital recording. In this case, the ones are represented by a magnetized area of the tape, and a zero is denoted by an absence of magnetism. One example of this type of digital recording (also known as "saturation recording") is the R-DAT. While saturation recording is less susceptible to the magnetic problems associated with tape, it is, nonetheless, still vulnerable to physical deterioration. R-DAT, as well as some of the newer multitrack saturation-recording schemes being used, have another problem: packing density. The density of the data on some of these new formats (R-DAT especially) is so high that, over time, bleed could obliterate the differences between ones and zeros, making the recording unrecoverable.

What's the answer? Doug Sax believes that there are really only two true archival storage mediums for sound. The first is analog, and it consists of cutting an LP, plating the master, then plating the first metal separation. This plating is then stored away, under archival conditions, *unseparated*! Doug says that you could separate these two halves a hundred years from now and play the positive half. You would have a perfect recording (once). The second method is digital, and similar to the first except that you store unseparated CD masters.

Speaking of CD, it too is a first-class storage system. Sax went on to say that it is ironic that today's consumer has, at his disposal, an archival system superior to those now used by the recording industry. This is just the opposite of the situation which prevailed only a few short years ago, when the recording companies had the most permanent copies, and we, the consumer, had phonograph records which started to deteriorate the moment we opened the packaging and played them. Barring any unforeseen disasters, a well-cared-for CD should last well into the next century. Now, instead of the record companies keeping yesterday's great performances safe in their vaults, it's time for you and me to keep them safe in ours. **S**

¹ The Modern Audio Association's Clark Johnsen also feels that the ideal archiving medium is boring old analog disc. Provided that it is undisturbed or played and kept in optimum conditions, a mechanical groove is a thing for ever, witness the excellent condition of cylinders and 78s from the beginning of this century. —JA

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Tonearms, like Rodney Dangerfield, never get no respect. When was the last time you heard someone actually argue the merits of a tonearm? Right, not recently. "Hey, I just got that new Gizmo tonearm!" "Oh yeah? What cartridge are you using?" People pick out the cartridge for praise and consideration time after time, while the tonearm gets taken for granted.

Change the material of the wires in the tonearm, or the interconnects to the preamp, and, granted, you'll get more attention than having switched to a tonearm with, say, an azimuth adjustment. After all, how much can it matter? The tonearm is not in the direct path of the signal. All it does is hold the cartridge, and as long as the geometry and VTF are within reason, it's doing a good job. Once again—no respect.

But the tonearm's role goes well beyond a mere support function. Due to its early appearance in the playback hierarchy, the tonearm can have a profound influence on the overall outcome of the musical event. And that's without touching on any functional or even aesthetic aspects of this component.

As a matter of fact, I submit that the tonearm

is not only the most active, but also the most influential component in your system. Every time a record is played, the tonearm is involved. It's an integral part of the playback ritual. The tonearm not only points the cartridge in the right direction, it also cues over to the right spot, raises the cartridge, and lowers it into the groove.

But it's not until the stylus settles into the groove that the tonearm becomes a crucial, active component of the reproduction chain. Besides having to keep the cartridge in step with the advancing spiral of the groove itself, the tonearm has to bear the swings and narrows of outrageous excursions. With luck, these will be recorded information, but anomalies of the black disc also have to be accommodated.

Consider this analogy: A pair of binoculars can be the brightest and the best, but if you don't hold them still the magnification and resolution are wasted. Gripping them in your hands is not enough; even with your elbows pressed to your sides, all you will see is a blur—the image wanders, jitters, and drifts. But if the elbows are supported on something firm, like a wall, everything steadies. Put the binocu-

lars on a tripod, and the results are rock-solid.

The tonearm has a similarly vexing task, only carried a step further. Take the same binoculars to a floating boat, stand up in it, and now try to sight on something far away. Better still, look at a bird in flight.

Well, a stylus riding a record groove has similar requirements. The cartridge has to be held rigidly and perfectly aligned by the tonearm in order to avoid image shifts, blurred transients, grunge, and the like. Except for one small problem—the groove is a moving target. It is cut in a spiral, requiring the tonearm to keep up with this path. The pressing could also be off-center, or worse, warped. It's a one-shot deal, in real time no less, without the benefit of error correction.

The tonearm, acting from a shifting reference position, has to provide the cartridge with enough steadying influence to allow the stylus to correctly garner every recorded nuance from the speeding record groove. And as if all that was not enough, the requirements also include adjustments for VTF, VTA, azimuth, and overhang.

Granted, it's complicated. But is the tonearm really influential? Most definitely. The point is that a tonearm can make or break (oops, poor choice of words, here in the world of megabuck cartridges) a cartridge. A cartridge cannot do the same for a tonearm.

For once, you're not at the mercy of garbage in, garbage out; instead, you're in a position to minimize it. What we have here is a case for generating minimum distortion at the point where the signal originates. It has been said before, and I'll say it again—if you don't get it right at the beginning, forget it.

The tonearm is there to make the cartridge look good by customizing its relationship to the groove, which, in turn, will optimize the interpolation of the recorded information. Here I refer to more than just the built-in facilities for trimming VTA and azimuth settings. We have now entered the subtle world of structural resonances, bearing stiffness, and similarly complex design problems. We have also crossed an imaginary line separating the engineering world from the realm of art.

Respectfully, I rest my case.

Fortunately, there are individuals who not only respect tonearms, but who are committed to perfecting them. One of these people, Leif Haggmark, designer and developer of the

Airtangent tonearm and the Swedish Magnepan and Krell distributor, has left no room for doubt about his commitment.

The idea behind this tonearm was to accomplish everything I have discussed and then some. That "then some" includes low moving mass in both planes, controlled resonances in the armtube, and user conveniences galore. Also, the finish is excellent, the design admirable, and the execution stunning.

Obviously, a very exciting product. But there must be a catch somewhere. There is—it costs \$3200. Sure, the Airtangent is imported from Sweden, but the biggest reason is the small number of audiophiles who partake of such sumptuous goodies. It's a case of supply and demand—of performance, that is.

The reigning ethos is that every little vinyl niche hides yet another nuance that *must* be explored. As a result, equipment that can live up to such expectations must perform to an upward-spiraling performance standard. Such high-performance products are available, but somebody has to foot the bill for the development—that small number of customers who appreciate these specialty items. The result? High bottom-line manufacturing costs for such products as the Airtangent.

It saddens me to see the very limited press that some very significant product developments get. It's a shame that more people will not enjoy or benefit from these remarkable fruits of intense dedication, nor those responsible get the recognition they deserve. But such is the fate of singlemindedness, I suppose. But as small as the high-end community is, the appreciation for audio exotica is intense. Leif tells me that a total of 325 Airtangents have been sold worldwide.

The Airtangent started out innocently enough. Leif merely intended to satisfy his own need for an all-out tonearm, so he built a few prototypes. Word of his achievement somehow got out—in the audiophile community there is really no such concept as secrecy—and his fame spread quickly. Before he realized it, his pet project had outgrown the bounds of unassuming private adventure. At that point Leif made a decision to go into the tonearm business and the rest is history.

Speaking to Leif bore out my theory that achievements in the high end are based on the drive of a few individuals. His intensity, pride, and perseverance are nothing but admirable.

(He got up at 4AM—his time—to phone in an explanation and some background information for this review.) It was also fascinating to see that express shipments from Sweden were much faster than some of the local transactions. In most instances, two days was all it took.

It is also why he never stops making improvements. A case in point is the cueing mechanism. When I first saw it, all he had was a manually operated mechanism. It did what it was required to do, but that was all. Next thing I know, the cueing bar is motor-driven. Leif had incorporated a small motor, normally used in cameras, in his design. Just recently I received a very sleek-looking mechanism which hides the movement of the cueing bar. This adds considerably to the overall elegance of the design. Leif says that he is driven to design the perfect product; I have detected nothing in his attitude that would lead me to doubt that premise.

The Airtangent—an Overview

Just what makes the Airtangent so special? Let's start with first impressions, something especially important for a tonearm costing \$3,200.

How many high-end products do you know that come packaged in an attache case? A flip of the lid is all that's needed to display each of the Airtangent's component parts, all properly secured in neatly contoured compartments of bright red foam. Against that background, the black and metallic finish of the components stands out ever so much more prominently and invitingly. This beautiful sight is bettered only when the Airtangent has been installed on a turntable.

Of course, the basic design is something we should know more about. In the case of the Airtangent, it's all in the name. While the "Air" part is obvious, the "tangent" may not be.

A tangent is a straight line touching a circle at one point only. More of interest here is another geometric fact: a tangent is always perpendicular to a radius of that circle. Simply put, if we keep the tip of the cantilever tangent to the record groove, the tip will always remain on the radius of the groove. Since the *raison d'être* of a straight-line tonearm is to replicate the original traverse of the cutting stylus, we are home free. All we need is a virtually frictionless bearing design—and air is the way to go.

Such rigorous design requirements demand exacting tolerances. Not only must the parts fit properly, the structural integrity has to cope

with resonances, stress, and stability. Recognizing this, an interesting conglomeration of materials can be found interspersed throughout the Airtangent, including acrylic, aluminum, copper, steel, magnesium, and titanium.

Every conceivable adjustment has been built into the Airtangent. Tracking force is set by a sliding counterweight, overhang and azimuth by a movable arm tube. VTA has a ball-bearing race with rack-and-pinion "steering." Also included is a damping trough for taming more exuberant playback situations.

But the one feature that sets this arm apart from the crowd is a honey: cartridges, completely adjusted and aligned, can be changed in seconds! That alone should make the Airtangent worth the price of admission!

As the air-tube is suspended only at one end, the other end is free, allowing the air-bearing sleeve to be easily slid off. Whole tonearm assemblies, balanced and set for each individual cartridge, can be exchanged with the greatest of ease. Just unplug a single connector for the cartridge signal, and the air-bearing sleeve and armtube are free to be removed. Slide another assembly in place, connect it, and you're all set to use another cartridge. The whole process takes less time than it took to read this.

But there's more. The icing on the cake is the electronically operated cueing bar for lowering and raising the cartridge, as well as the end-of-record auto-lift feature. The latter feature is a truly worthwhile convenience seldom seen on a high-end tonearm.¹

Last, but not least, my favorite part—execution. Nothing but the best workmanship and parts have been used. For example, Tiffany are used for the output connections to the preamp, and Lemo connectors elsewhere. I've already mentioned the interesting intermingling of exotic materials in use here, as well as the Airtangent's stunning design presence. But it's at the detail level that praise should be heaped. Every little detail seems to fall into place, resulting in a product that has my highest admiration.

I don't hesitate to mention a Rolls-Royce and an Airtangent in the same breath—it's a design that easily conjures up thoughts of other renowned creations. The Hasselblad, for one,

¹ It's so easy to bury your head in the sand. While enthusing about the Airtangent to a non-audiophile friend, I mentioned the auto-lift feature. He was nonplussed: "Don't most ordinary turntables give you that convenience as a matter of course?" he asked.

springs to mind for obvious reasons—its reputation is legendary, and it also hails from Sweden.

What hath Leif wrought

The basic air-bearing mechanism is very simple. First, take a hollow rod and hold it stationary, in a horizontal position. Next, close off one end, and force pressurized air outward through numerous tiny holes drilled radially in the wall of the rod. Now slide a sleeve over it, keeping the clearance between the two pieces to about one thousandth of an inch (25µm), and attach an armtube for the cartridge. You're in business.² Well, almost.

In the Airtangent, one end of the hollow rod is attached to the "mounting tower," a block of acrylic roughly 2.5" high and 1½" square. The rod, 6⅞" long and 1" in diameter, is suspended horizontally as a cantilever. This rod—the air-tube—is the source for the tiny air-streams used to create the air bearing for the sleeve assembly. To maintain the required accuracy and stability, the air-tube is manufactured from titanium. The air holes are not visible to the naked eye. The air can, however, be felt if a hand is placed very close to the tube.

The mounting tower is actually in two parts. One half is stationary and bolted to the armboard. The other is free to move vertically, and acts as a central coupling point for all the components comprising the tonearm. A miniature rack-and-pinion gear assembly is provided to move the two pieces with respect to each other. The two pieces are accurately linked by a vertically aligned linear ball bearing, and can be moved with respect to each other with the help of the rack-and-pinion.

The key word here is "vertically"—OK, you guessed it—that's the VTA adjustment. The shaft of the pinion is accessible, and attaches to a lever. VTA changes are effected by rocking the lever, vertically displacing the air-tube and the sleeve-bearing assembly. A locking screw secures the desired position. This couples the two pieces of the mounting tower together, and provides the necessary mechanical integrity for stable playback conditions.

The stationary half of the mounting tower

fastens to the tonearm board with a ½" bolt. (Even the ½" Allen wrench is provided in the mounting kit.) Torquing this bolt home establishes very solid contact between the two surfaces.

But Leif goes beyond this. To avoid rotation of the mounting tower in the horizontal plane, three pointed screws, about ⅛" in diameter, extend through the tower vertically. The points penetrate the surface, anchoring the whole assembly in place.

The active parts of the tonearm are attached to the air-bearing sleeve. Here, on the platter side, we find a clamp holding one end of the armtube for the cartridge. This 7¼"-long magnesium armtube does not differ significantly in size from those in ordinary pivoted designs. It's a sleek-looking tapered tube extending over the platter, with a rectangular platform for the cartridge at the end. The other end is gripped by a clamp on the aluminum air-bearing sleeve. This keeps the weight down and the rigidity high. The inside is filled with foam for damping, and to keep the cartridge signal wires from rattling.

The clamp is loosened to align the cartridge, thus freeing up the armtube. For overhang, move it along its axis; for azimuth, around it. The settings are locked into place by tightening the clamp.

A sliding counterweight on the opposite side of the air-bearing sleeve balances the cartridge and the armtube to provide the required VTF. A couple of weights are supplied, one large, the other smaller, to accommodate a range of cartridges. For the same reason, the armtube comes in two stiffnesses: the standard armtube, and a mechanically bolstered version (optional) for cartridges requiring more rigidity. Leif mentioned the MC-3000 and the Koetsus as candidates for this application.

The cartridge signal passes from the armtube to the mounting tower via Litz wire from a special source. Besides its electrical purpose, this miniature cable is the only mechanical link between the air-bearing sleeve and the outside world. Some very careful positioning of these wires is necessary to avoid drag from this source. The spring action of these tiny wires can seriously impede the virtually frictionless air bearing if not treated with care. These wires are terminated at a miniature Lemo connector which plugs into its mate on the mounting tower.

² Of course, there's more than one way to skin a cat. Eminent Technology chooses to hold the sleeve stationary, and allow the rod to move. The air is supplied to the sleeve. Versa Dynamics has yet another variation: They hold the rod still and move the sleeve, but the air supply is fed to the sleeve via a flexible hose.

Signals from the arm proper are routed to a pair of Tiffany jacks on an outboard termination box. This interface box also provides a junction point for the vinyl air-supply hose from the pump. (The latest versions also house the circuitry and battery for the cueing mechanism.) The On/Off switch for this mechanism terminates here as well. I found this box very useful, as all external connections—electrical signals or air supply—are conveniently collocated.

Leif's thoroughness extends all the way to the air-supply pump. To provide even air flow, the pump includes a reservoir for storing a small volume of pressurized air. The pneumatic nature of air helps smooth out the individual thrusts of the pumping action.

Any way you look at it, the overall result is very impressive. The Airtangent projects a powerful, elegant image.

Mounting Excitement

I can't tell you how happy I was to have everything fall into place very smoothly while mounting the Airtangent. I wanted to get the job done quickly and get on with using the tonearm, but I also wanted to savor this process; I seldom handle such refined equipment.

Once again, Leif came through. Except for a called-for $\frac{1}{2}$ " drill bit, everything necessary for mounting, setup, and adjustment was supplied. He has assembled a very comprehensive collection of tools, templates, and alignment aids to simplify the installation of his tonearm. Most everything you can think of was included here: the necessary Allen wrenches, a drilling template, the hardware, and a number of setup jigs. These last consisted of a blank record to help set the final level of the turntable, and the straight-line jig for positioning the stylus of the cartridge. I was impressed.

After savoring each component during the get-acquainted process, I proceeded to mount it on the armboard. Fortunately, I still have the VPI HW-19 Mk.II on loan from Harry Weisfeld. Of the many aspects of this product that type it as an audiophile product, one in particular stands out. This turntable is extremely well-suited for changing tonearms. With each tonearm mounted on its own tonearm board, the whole assembly can be removed easily and substituted with another. I can report happily that the Airtangent was mounted without a hitch. As a matter of fact, I was pleasantly sur-

prised how smoothly the setup and alignment went. Of great help here was my previous experience with the ET-2, another parallel-tracking, air-bearing tonearm. That arm taught me the importance of leveling, and how to deal with little nagging problems such as dressing the cartridge signal wires for minimum drag.

But not everything came up roses. Wiring the termination box was pretty frustrating: too many inaccessible parts in cramped quarters, and short tonearm leads, required that the work be performed very close to the turntable. I hope Leif gets a chance to redesign the box next time around.

Other improvements could be made: First of all, a high-quality stylus-force gauge should be included with a product like the Airtangent. That would make the set-up process independent of existing equipment.

Second, a dial gauge should be available, maybe as an option, for calibrating the VTA settings. At the very least, some markings along the linear bearing in the mounting tower are desirable to keep track of the VTA position. And don't tell me to use the position of the rack-and-pinion lever; that's too coarse, and not in keeping with the precise nature of this instrument.

Third, the azimuth adjustment should be more substantial. It's not enough to loosen the clamp and rotate the armtube. These rotational increments are haphazard, and, while better than none at all, something along the lines of the Triplanar method would be welcome.

Airtangent has made wonderful progress in rewriting and generally overhauling their instruction manual. I have seen three editions of it, and am happy to report vastly improved results. The initial version was written in Swinglish and left a lot to be desired. Now, besides much-improved English, illustrations have been added and helpful hints abound. The latest version is clear, instructive, and truly helpful.

Sonic Impressions

As you have no doubt surmised, I have nothing but the highest regard for the design and execution of this product. But it was the sonic performance that really took me by surprise. I had a very good idea that it was going to be good—too much reliable fanfare had preceded it—but I was unprepared for the excellent sonic revelations awaiting me.

Oh yes, this was special. It was obvious well before the first cut was completed, and before any adjustments were optimized. I just knew that I was dealing with an extremely exciting product, and that a new level (at least for me) of sonic refinement had been attained. And that's from someone who owns the SME V and Well-Tempered tonearms.

The music immediately came to life with a marvelously refined and inordinately stable soundstage, the lifting of several layers of veiling, and, overall, meticulous, rich, and harmonious reproduction. It was stunning!

Airtangent is my name, and details are my game! That's what this tonearm was telling me. It sure was music to my ears: mesmerizing, thrilling, I couldn't get enough of it. I played whole sides of album after album, marveling the whole time at how much more information was still available from records I have been playing for years.

Three cartridges were used to evaluate the Airtangent: Koetsu Rosewood Sapphire Signature, Ortofon MC-3000, and Monster Cable Alpha Genesis 1000. All three performed extremely well, but the most potent coupling resulted with the MC-3000. The very low tip mass and the Fritz Gyger "Replicant" stylus profile contributed to the spectacular sonics, which featured detail, definition, and dynamics with unprecedented precision.

To be fair, since I am singling out performance aspects, it should be mentioned that the Alpha Genesis 1000 turned into a remarkably dynamic performer; I nodded in approval many times, while the Koetsu displayed harmonic richness of sumptuous proportions. I have no doubt that each cartridge benefited handsily from being fitted to the Airtangent.

Other equipment used for this review consisted of the following: the VPI HW-19 Mk.II turntable supported by an Arcici "Lead Balloon" stand; Museatex PA-6i, ARC SP-11 Mk.II, and Krell KRS-2 preamps; Krell KMA-100 Mk.II, Classe DR-9, and Museatex MTR-101 power amps; Apogee Diva and Celestion SL-600 loudspeakers; Museatex interconnects and speaker cables.

I suspect that the apt ergonomics of the Airtangent aided the excellent sonic performance. The significantly simplified setup procedure made it possible to quickly zero in on the best performance, thus setting the tone for very relaxed listening sessions. Since readjustments

were convenient and could be approached without apprehension, the tonearm was viewed and treated favorably at every step of the way.

The Airtangent had a very transparent, smooth, and delicate character. I got the feeling that the stylus behavior was more precise now that the alignment requirements were better fulfilled. Since the stylus was positioned to deal with the complex groove modulations more effectively, the musical mosaic appeared to fall into place effortlessly. An excellent demonstration of this is the "Silent Night" cut from *Cantate Domino* (Proprius PROP 7762). Not only was the sweep of the choir very wide and deep, it was also wonderfully delineated to individualize the members of the choir. The acoustic of the church and the multi-hued choral colors were rendered with marvelous presence. The carefully crafted sound appeared less labored, conveying a feeling of freedom and openness.

That goes for every cartridge I used—each responded with more detail. And since detail is the staple of such desirable sonic commodities as air, space, nuance, intonation, and harmonies, just about every recording became an exciting adventure.

Most of the drama materialized in a sound-space presentation of billowing proportions. The soundstage not only grew considerably as far as width and depth was concerned, but became more coherent and seemed filled to capacity with ambience cues. The performers, in general, remained in their accustomed positions, but now their presence was more prominent and clearly outlined. While better imaging contributed considerably, the more gratifying contribution was the airy surround enveloping each performer. Everyone's presence was more profound, and the illusion of a more credibly recreated musical event was more pronounced. The music could be as diverse as the solemn *Cantate Domino*, or Larry McNeely's bluegrass on Sheffield (LAB-9), and the presentation was clearly perceived in a more involving fashion.

The most-asked question about the Airtangent was the low end. "How's the bass? Does it go low enough?" they would ask. What I heard through the Divas did not give me an indication to suspect a shortfall in low-bass performance. The wallop and push were there to render full orchestras credibly, with enough attack and excellent dynamics.

In fact, the definition in this area, as heard

on the Telarc *Carmina Burana*, was remarkable. The impacts of bass drums and the decays that followed were rendered with great clarity. And when I played Robert Gibson's piece for double-bass and oboe (Spectrum SR-313), it seemed I could count each vibration.

In keeping with its ability to keep every note and nuance in place, the Airtangent displayed an unremitting ability to portray most of each recording's essential attributes, good or bad, starkly intact. Though such thorough truthfulness can become a liability, the situation here was the direct opposite. Sure enough, a number of recordings were brought to their knees, revealing a few very unsavory character flaws. But most of the time these exposes were exciting. Many recordings could now be seen in a more fascinating light than before, and were, therefore, sonically more eloquent.

Improved dynamics also contributed significantly to the second coming of many of my recordings. I repeatedly found myself marveling at the added sock, push, and punch of many favorites. The Chesky *Scheberazade* (RC-4) was a good case in point. The shudders and throbs of full orchestral assaults pulsated with more energy and involved more acoustic space.

Digging out old favorites can very dramatically point to sonic gains. The "Most of Us are Sad" cut from *The Eagles* album (Asylum SD-5054) did just that. The voices had more power, the drums kicked harder, and the bass guitar had additional strength. That's not to imply any loss of delicacy. Many new nuances sprang forth with vim and vigor, and the articulation of transients and harmonies was rendered with remarkable clarity.

The Airtangent also had a say in trackability. The same cartridges had been used in other arms, namely the SME V and WTA, and, while the results were generally gratifying, a certain loss of control at high recording levels was apparent. Loud passages would tend to become edgy and turn nasty.

A good example is Van Morrison's *Moon-dance* album (WB BSK-3103). Here Van has been recorded to give his already ragged voice a very peaky edge. I didn't realize how much of an improvement was possible until the Airtangent was used. His voice was still as raucous and shrill, but now it was much more revealing of the inner complexities which were a blur at other times. As an added bonus, the instruments of the band could also be heard more

vividly, with more focus and far more space, making for a significantly improved experience.

I thought it only fitting that the Airtangent be compared with the SME V. This remarkable incarnation of a pivoted approach has become a benchmark of sorts for tonearms. Its price also benefits handsomely from mass production, making it a more accessible product at \$2000.

As fine a product as the SME V is, it does have a few shortcomings. The first has to do with VTA changes. Curiously enough, even though this arm has no provision for adjusting the azimuth of a cartridge, azimuth can be disturbed while resetting VTA. It can happen when the main support pillar of the SME V is canted while increasing VTA. Since the VTA screw is located off to one side of the arm pillar, it pushes harder on that side when turned to raise the back of the arm. An azimuth change results unless the pillar is manually restored to a vertical position; an upward pull on the anti-skate dial support does it for me. Sumiko maintains that tightening the clamps gripping the arm pillar will restore it to a vertical position, but my experience does not bear that out.

The second shortcoming concerns the large diameter of the armtube at the pivot end. When going for very low VTA settings, especially if a warped record is played, the back of the arm can end up too low, and hit the outer edge of the record. This problem becomes acute when playing the innermost cuts.

It might have been more informative to pit the Airtangent against the ET-2, since both are tangential-tracking, air-bearing designs. I feel, however, that bringing in the SME V at its \$2000 price is more realistic. Anyone considering the ET-2, a terrific buy at \$900, is not likely to suddenly opt for a \$3,200 product. \$2000 is a bit closer.

Both tonearms are excellent performers, but differ greatly in concept and execution. For me, the ergonomics clearly favor the Airtangent. My priorities call for the ability to adjust everything, and the Airtangent is more complete. In day-to-day use, both are easy to live with. The cueing mechanisms are equally effective, but the motor-driven Airtangent approach has a special appeal for me. Sure, it's one more thing prone to failure, but it is also ever so much more fascinating technically. Of course, the end-of-record lift feature speaks for itself—a winner if there ever was one.

Mounting a cartridge in the SME V is a snap; and I have it down to about 10 minutes now. But the Airtangent, even though the initial setup takes much longer, out-features the SME V with its interchangeable air-bearing sleeve assemblies. Here cartridge changes happen in 30 seconds or less, and with perfect registration of all settings save VTA. If you recall, that's an extremely easy task on the Airtangent.

Be aware that the extra air-bearing sleeve/armtube comes at additional cost, since only one is included with each Airtangent. Furthermore, if only one cartridge is to be used, all of this flexibility is a moot point. But you tell me—What audiophile will not jump at the chance to change cartridges that conveniently?

I found the Airtangent to be my preference sonically as well. The smooth demeanor and wealth of new details of the Airtangent significantly contributed to its overall performance. The SME V was found to be more robust in the low end, and slightly more aggressive. It contributes a more forward and direct quality at the higher frequencies, and, while fast and detailed, falls short when compared to the Airtangent's extension and delicacy. Furthermore, the soundstage is not as ornate, or as rife with crucial details.

Spectrally, the Airtangent is smoother, with better extension at the higher frequencies. The SME V summoned a very solid foundation for the music and, most of the time, produced a more prominent balance in the lower ranges. To be sure, the Airtangent might be accused of some leanness in this area. I found it to be a better balance for me, however, as it blended more effectively with the equipment at my disposal.

The added bonus was the transparency and definition of the bass frequencies. Yet it was in the midrange that the Airtangent did the most good. Every cartridge produced a more transparent presentation, and the Koetsu's legendary midrange richness became more apparent when mounted in the Airtangent. The lower midrange could be seen in a new light, adding impact and heft in a very palpable manner.

Conclusion

I'm completely taken with the Airtangent tonearm. But you don't have to be a CPA to realize that, for the price of an Airtangent, you can get the SME V and a top-flight cartridge. Of the three cartridges mentioned, only the Koetsu is above that budget—something to consider carefully.

Just remember that the Airtangent outperformed the SME V in a majority of cases, and, for all its complexity, is very easy to use. So what if you have to remember to turn off the air pump? That's more than compensated for by the end-of-record lift mechanism. For the consummate audiophile in me, the Airtangent tonearm is, in many respects, a dream come true. At the same time, it is also one of the finest products that I have ever encountered. For anyone who believes technology is something to be savored, the Airtangent is certainly served up most delectably. It is one of those rare products in which functionality, ergonomics, and aesthetics are blended with resounding success. The Airtangent is an elegant affirmation of just how synonymous high-end and high-tech can be.

Of course, I recommend it!

S

KLYNE SK-6 PREAMPLIFIER

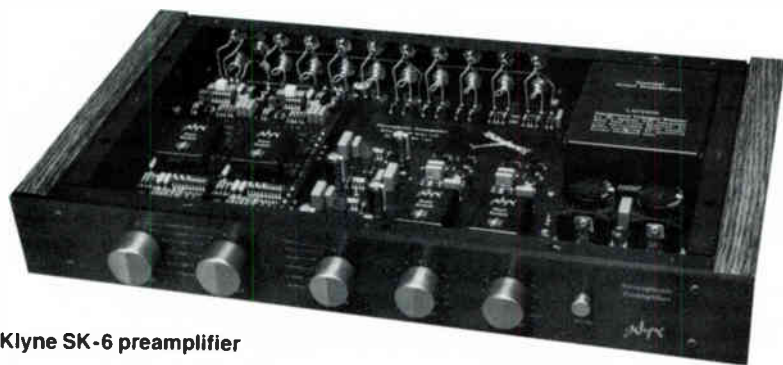
Martin Colloms

Full-function solid-state preamplifier. Dimensions: 2.5" H by 19" W by 12" D. Price: \$1950 complete, \$1450 without phono card. Approximate number of dealers: 25. Manufacturer: Klyne Audio Arts, Ltd., 828 7th Avenue SE, Olympia, WA 98501. Tel: (206) 943-5420.

When commissioning this review, *Stereophile's* editor, John Atkinson, explained that he felt the \$1500–\$2000 price range to be a key area for preamplifiers in the US market. Models costing more than this are considered to be moving into the luxury class, while those at lower prices may be very worthy but really should

be classed as budget-priced components.

The \$2000 price tag should provide a high performance standard on both subjective and technical fronts, as well as good build, design, and a high measure of versatility. The customer has come to expect a straight-line design free from unnecessary tone controls or filters, these



Klyne SK-6 preamplifier

minor features sacrificed in the pursuit of the maximum sonic performance for the money.

Stan Klyne's new SK-6 fits the bill very nicely, and, given the excellent reputation established for his high-end SK-5a design, this midpriced model holds much promise.

Finished to a superior standard, the SK-6 is cleanly styled with a linear array of five rotary controls, the latter subtly sculpted to give an indication of position. A momentary pushbutton controls the muting, with electrical power on/off accessed via the rear panel. The idea here is that, in the case of a low-consumption unit such as this, it can be left powered semi-permanently, always warmed up and ready for use. "Mute" is used as a standby control. Like the Audiolab 8000 and Mission Cyrus series, two independent signal selectors are used for source selection, one for "listen" and one for "record." The standard preamp model has four auxiliary/line inputs, plus replay for tapes 1 and 2. These options are repeated as "record out" signals on the "record" selector. When the phono card is fitted, as it was for this review, the first of the four auxiliary inputs then becomes the analog disc input, and is labeled as such. The next control is the "mode" switch, offering stereo, stereo with low-frequency filtration (a -3dB rolloff at 22Hz for rumble and subsonic protection), then mono, stereo channel reverse, mono left-channel source, and finally mono right-channel source. Volume and balance comprise the last two controls.

On the rear panel, an array of gleaming gold-plated phono sockets meets the eye. Mains input is via a detachable IEC-type three-terminal plug. The top cover can be replaced by an acrylic one in order to show off the elegant interior. (This is on the assumption that noise problems will not be encountered.) The

standard finish is a champagne (called platinum) gold for the panel and controls, with a black case. An alternative black fascia with dark-grey metallic knobs is available, and optional black-oak side bars can also be fitted. The design has a low profile, with a self-contained power supply.

While the basic lineup is classical "straight-line," this preamp nonetheless holds some surprise features: The line amplifier has an internally switchable gain of 20dB (x10) or 14dB (x5). If fitted, the phono option accommodates a range of moving-coil and moving-magnet cartridges via internal gain settings, these supplemented by a fine control of input impedance (both capacitive and resistive), as well as for high-frequency rolloff equalization: -3dB treble filter points can be selected from 15, 20, 25, 30, and 40kHz. This all adds up to a product of unusual versatility which can be fine-tuned for optimum results in a given system.

Technical Details

A solid-state design, the SK-6 uses a generous helping of discrete regulators. A prime regulator provides a clean, stable, two-polarity DC supply which is then allocated to a "star" configuration of six further regulators, one for each major circuit stage in each channel, effectively resulting in a double-mono configuration.

The circuit is based upon high-quality "op-amp" stages made using discrete components. These are encapsulated, the result being what Klyne terms a "Music Module"; shades of the ARC solid-state gain block. These gain blocks are set for optimum performance in specific circuit positions, and, in the case of the line amplifiers, are DC-coupled. The disc input signal enters via a discrete differential stage, this consisting of matched-pair devices in a single

can. The subsonic rolloff is achieved by a series-connected 0.22 μ F polypropylene capacitor leading to the balance control, this bypassed for "flat." Series-type RIAA equalization is employed, using high-quality passive components, and with adjustable high-frequency equalization. Reliable IC-sized DIP switches are used to implement the variable input impedance and HF rolloff options, these providing a positive switch action.

The potentiometers are high-grade units from Noble, while the fact that the selector switches are sealed units helps to keep their contacts free from contamination. The power supplies are well decoupled, and good capacitors are fitted in the IC op-amp servo (TL0718CP) circuit which holds the output at virtually 0V DC. Coupling capacitors are kept out of the signal path. Shunting, over-voltage-limiting, back-to-back Zener diodes are placed at both input and output to guard against unwanted surges. In the event of a "brownout" or momentary power loss, the FET muting circuits operate automatically.

The circuit is founded on a top-quality, double-sided printed circuit board well secured against vibration, and is used professionally with a full ground plane. Selected Teflon single-strand cable links the phono sockets to the circuit board. The layout and construction are certainly attractive enough to warrant the use of the alternative acrylic cover.

Testing began with a first review sample, but this was replaced at Klyne's request by a second. Additional circuit elements were present in the first review sample which had been deleted on the second (and better-sounding) sample. [See also "As We See It" for a fuller discussion of the differences. — Ed.]

Testing

The SK-6 was subjected to my full lab-test program to establish its technical performance limits, as well as to examine the interfaces, their matching properties, and to explore the variations provided by the internal switch combinations. A preamplifier with a good technical performance may not necessarily be the best-sounding; clear flaws in input overload margin or steady-state frequency response cannot be ignored. It's like going for a health check up—nice to know everything's OK, but the doctor can't predict your physical or intellectual aptitudes on the basis of a health report.

For the listening tests I used Apogee Duetta Signatures, partnered by my customized SL700s (no questions, please) in company with Goldmund Mimesis Three, Audio Research D125, and Krell KSA-200 power amplifiers. Cabling included Siltech and Siltech equivalents—and some handmade specials. Reference preamplifiers included the Pink Triangle PIP and British Fidelity MVX, partnered by an ARC SP11 II and an SP9 (late '88). I also have had recent experience of the C-J PV7, the Matisse, and the British Fidelity Preamp 3B.

CD sources included the Stax Quattro II and a customized Cambridge Audio CDI, while analog disc signals were generated by my Goldmund Studio T4 turntable fitted with a Koetsu Rosewood Signature. I felt completely comfortable working in the Klyne SK-6's territory.

Sound Quality: Analog Disc

After a warmup of several hours, my practice is to run an extended session on a product such as this to allow it and me to settle down, and for me to take full stock of the situation. Comparisons with other references come later.

When working down from more expensive equipment, it is easy to fall into a framework of negative comment and criticism, as one describes the inevitable shortcomings of a less costly design. Conversely, when working up the review scale, the criticism often tends to be too positive, noting the sonic enhancements afforded by a better product and higher budget. Both critical excesses need to be avoided. Incidentally, it is quite a common practice for a skilled product-promotion manager to cultivate and flatter an inexperienced equipment reviewer by feeding him an increasingly costly chain of designs, hoping for an even better review for each product as the ladder of quality is ascended. Even if a reviewer does not indulge in a personal top-quality system, he or she should be well acquainted with the full quality range of available equipment. Hoping to avoid these pitfalls, here is the lowdown on the sound of the SK-6's phono stage. (The same board was used in both samples. My comments on the sound of the phono stage are based on experience with both samples; differences are noted in the text.)

Beginning at the beginning, I started with vinyl with the switches at the factory settings of high gain: B1, 3, 5, "on," 1000-ohm input

impedance, A3 "on," and no treble contour; 7 through 10 off. The SK-6 demonstrated some distinctive aspects in its representation of music.

While fundamental aspects of the stereo balance, a wide subjective bandwidth, and a decent level of neutrality were easy to verify, and good recovery of high-level detail was also apparent, the SK-6 did not deliver an immediately arresting performance. The standard was certainly high, but it was not an obvious class leader.

That is not to say that the SK-6's performance was not a likeable musical event. It was; the problem may well be that I expected more. First impressions were of a basically good performer denied greatness by a comparatively shallow soundstage, one which made a good attempt to paint in the performers but was significantly weaker in sketching the geometry of the space and perspective around them. There was a dryness about the presentation, a degree of muting of the natural hall acoustic present on several recordings, which helped spotlight soloists but reduced the awareness of scale and space for the listener. The term "bleached" is actually too severe a term to apply to the SK-6 without careful qualification, but it has some relevance nonetheless. Tonal color on individual instruments seemed to sound paler—a touch washed out, while a very subtle whitened film appeared to moderate one's perspective of depth and space beyond the frontal soundstage. I felt that the dynamic rendering was "good," but had anticipated better from a design of this price and quality. The best description is one of an apparent slowing of pace and drive in the musical performance. This preamp appears to cruise along rather than transmit the necessary musical impulse to swerve and accelerate, according to the scoring and the musicians' own interpretations.

Competing models can offer a touch more transparency and hall ambience as well as more dynamic involvement.

Working through the frequency range from top to bottom, the treble was undoubtedly sweet, and hinted at a mild dullness and a loss of both high-end air and sparkle. The treble was high in detail and specific resolution, and was rated well as regards audible distortion. A small degree of soft grain was present which sounded more like ripples on the surface of a pond imparted by a gentle breeze than a specific fracturing of the definition. A little more

edge and sharpness would have been welcome on transient sounds. The treble quality sounded nearer to open-reel tape than to a direct-cut recording.

In the upper-midrange/lower-treble, the first sample of this preamplifier showed a mild but identifiable coloration most evident on classical strings. Here a sheeny, slightly artificial quality was added, a sort of dulled polish rather than chromium plate. As a related effect, vocal sibilants were perceptibly softened. The revised sample was clearly more neutral, lacking this false softening, which must, therefore, have been an attribute of the first sample's line stage. Moving on to the prime midrange, I considered the performance here to be consistently neutral, both in terms of coloration and overall tonal balance. The SK-6 possessed a most even character, and did not draw attention to itself as many lesser products do. The midrange was pleasantly musical, and while it must be admitted that a trace of classic "solid-state" character exists, the sound was almost totally lacking in any suggestion of hardness or other similar fatiguing distortions. In the lower midrange, the SK-6 performed well, showing a substantial degree of definition and articulation on cellos, plucked double bass, rock drum kit, and kettledrum; many designs fail in this area, but the Klyne design held on to the fundamental midrange standard.

In the bass it was not quite as strong. A loss of instrumental resolution and tunefulness was noted, and while it was clearly evident from the subsonic excitation of the speaker diaphragms that the SK-6 had very extended low-frequency response, it did not sound quite that way. Low-mid/upper-bass was rated well, but the low bass seemed perceptibly slowed, and lacked slam as well as bottom-end weight. It seemed a touch out of step with the crisper and drier upper-bass performance. The rumble filter helped ameliorate the subsonic noise, but took the edge off bass slam and definition.

Stereo soundstages were exhibited on a smaller scale than the top references, but both depth and focus were classed as very good, in particular contrasting with the weakness of the first review sample. Stage width was up to standard in the frontal plane, but it did narrow back in the soundstage. The image was presented a little closer than usual though not aggressively so, and I also noted some loss of front-to-back dimension. More ambience and air would have

been welcome, this loss detracting from the immediacy of some material.

In the SK-6's favor was its consistent, mild-mannered delivery, a tidy coherent sound which suited a variety of ancillaries without any matching problems.

One aspect to emerge as the listening proceeded could well be relevant. Noting that I used a fairly healthy Koetsu Signature to drive it, and employed very smooth loudspeakers, I found that a touch of background noise and hiss was just audible on passages played at realistic but certainly not overpowering orchestral sound levels. In my experience, mild background noise is not a specific barrier to low-level detail and transparency, but the SK-6 could prove an exception to this. Certainly toward the end of the listening sessions, I was left wishing that this preamp had a still quieter phono input. An improvement of 6–10dB should be enough.

Sound Quality: Line/CD

A certain euphony characterizes the sound from a good analog source and is not lost in its transmission via the SK-6. Digital sources need careful handling if their fragile balance of high-tech sound and musical content is not to be upset, leaving an often mechanistic bias. Poor digital is boringly mechanical, and rightly leaves many analog aficionados cold.

Good digital sources can work their own kinds of musical magic, but it is essential that subsequent "electronic" sonic influences are kept to a minimum; very precise, very neutral linear stages are required from good preamplifiers. By normal standards, the SK-6 does have a respectable line amplifier—without it, the preamp could not have done the good job it did on vinyl disc. The line stage of the first sample materially affected my digital sources, however. Piano lost some of its attack and articulation—notes did not properly echo back into the acoustic of the venue. Double bass lost life when played pizzicato, while some of the pitch clarity of the bass was also impaired. As noted in the vinyl section, strings exhibited a mild sheen which, on the sharper bowed sounds of some CDs, lent a raspy emphasis. As before, I heard "rippled" grain in the treble. A moderate loss of dimension was evident in the stereo soundstage—height, depth, and width—while orchestral perspectives were somewhat compressed. The loss in air and ambience was felt to be more serious, the CD/SK-6 combination

tending to sterility with the first sample. Focus remained good to very good.

However, the line stage of the second sample represented a significant improvement. Stereo depth was clearly better, moving up from "good" to "very good," while stereo focus was also improved and dynamic presentation was superior. Much of the "bleached" effect was removed, and the SK-6 moved confidently to a position commensurate with the best in its price range.

The sound was more airy and open in the treble, purer on sibilants and lower in grain. It also showed more detail.

Lab Report

All the measurement work was performed on the second, much better-sounding, sample. Taking the analog disc input, I found some weaknesses which could affect sound quality, depending on the program and its treble content, as well as the specific cartridge and the SK-6 internal switch combinations used with it. Compared with established standards, the margin between input noise and overload for this Klyne was rather closely drawn. By my established technique, with an IHF moving-coil input of 500mV—a pretty healthy level—the noise level was 66dB down (CCIR filter, 1kHz ref). 72dB is typical for the industry, though 80dB is attainable.

Using the high-sensitivity positions that are necessary for standard moving-coil cartridges, and those with respectably healthy outputs at that, the SK-6 showed signs of marginal overload at high frequencies. At low and mid frequencies, the IHF overload margin measured fine at 26dB but was reduced to 21.8dB by 20kHz. Correlation was shown in the two-tone high-frequency intermodulation test (19/20kHz 1:1), which resulted in –33dB, or 2.5% difference-tone (1kHz) distortion for a comparatively modest 40mV peak-peak input signal (fig. 1).

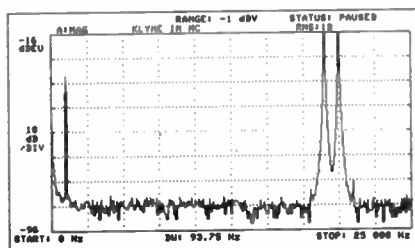


Fig. 1 SK-6 MC input intermodulation

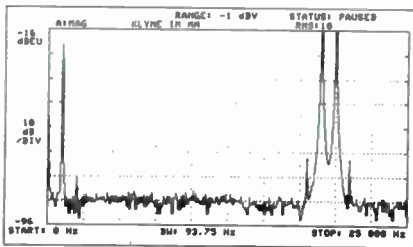


Fig. 2 SK-6 MM input intermodulation

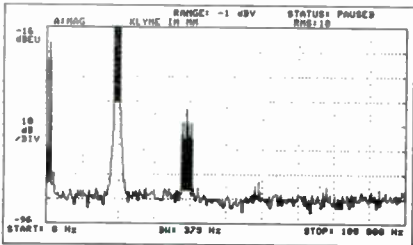


Fig. 3 SK-6 MM input intermodulation showing sum products

Placing this in perspective, the usual 26dB overload margin at 20kHz for an IHF moving-coil input corresponds to 282mV peak-peak. This disc input showed signs of slew-limiting at high levels and high frequencies. The situation worsened when the SK-6 was configured for high-output moving-coil/moving-magnet cartridges, a condition which one might wish to exploit to achieve the lowest background-noise levels. With the input drive and preamp sensitivities correctly set—indeed, with the “moving-magnet” sensitivity at its lowest—the slew factor worsened, presumably due to changed matchings within the disc amplifier. While the low and mid frequency-overload margins were increased as expected, and were excellent at 32dB IHF, the input limited at a 10dB overload margin at 20kHz, a distinctly weak result. The corresponding intermodulation result is shown in fig.2, where the difference-tone distortion at 1kHz can be seen to lie at -22.5dB, or about 8%. The input signal was 400mV p-p, while a typical IHF 26dB overload margin corresponds to 2.82V. Fig.3 shows the analysis of the 19/20kHz intermodulation with the bandwidth extended to 100kHz to show the sum products, these lying at -45dB.

The SK-6 showed signs of limiting at an input level of 100mV rms at 20kHz, too close to the peak program envelopes for comfort given that some cartridges have significant treble lift and also show a range of available output

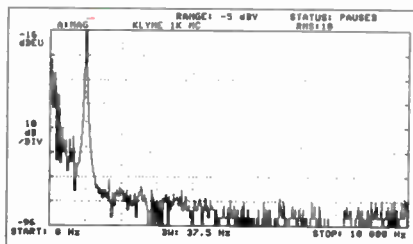


Fig. 4 SK-6 MC input harmonic distortion

levels. The intermodulation results were significant, as difference 1/M products appear as inharmonic “hash” noise placed right in the middle of the audible band, occurring during strong high-frequency program information. At worst, treble sounds may be slurred or smeared or, in more subtle doses, there may be a loss of clarity, focus, and depth. The tonal quality of strong transients is often affected with a softening and slowing of fine “edges.” The ability of a system to retain the excitement and correct transient “bite,” reproduced without artificial hardness, is the hallmark of top-quality equipment.

Advice should be sought from a good dealer and from Klyne itself concerning the optimum settings for particular cartridges. Klyne does provide good advice in their manual for matching various models of cartridge input loadings and high-frequency contours, but not for gain/sensitivity.

No distortion problems existed at lower frequencies, and a spectrum analysis for a 1kHz tone at IHF level fed into the MC input showed no harmonic products at all, even to the -80dB noise baseline (fig.4, taken with a 37.5Hz analyzer bandwidth). The other major parameter for the disc input is frequency response—the accuracy of RIAA equalization. High accuracy is important here, as errors tend to be broadband, and, in careful comparisons, a deviation of as little as 0.2dB over an octave or two can be significantly audible. Fig.5 shows the SK-6 RIAA flatness with the input set for a low-sensitivity moving-magnet condition (generator output impedance 600 ohms, SK-6 input impedance 47k ohms, low capacitance, no response shaping). With 500Hz as a natural pivot frequency, the treble was very slightly shaded to a maximum of -0.15dB by 20kHz. In mild augmentation of this trend, a gentle lift was seen in the low bass, just +0.2dB at 30Hz, rising to a harmless +0.3dB at 15Hz. This is a decently accurate

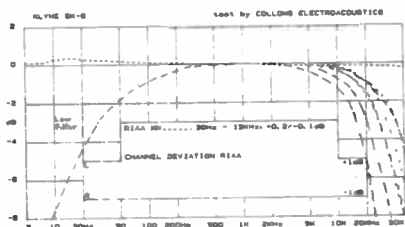


Fig. 5 SK-6 RIAA error, MM input

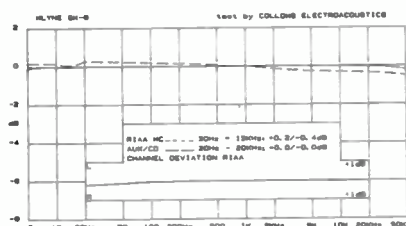


Fig. 6 SK-6 RIAA error, MC input

equalization; it would be hard to argue for any audible character. Note that there is no sign of a rolloff, even at 5Hz. With some disc sources, the use of the high-pass filter setting may be essential, though its 6dB/octave slow rolloff (-3dB at 22Hz or so) implies a concomitant loss of weight in the midbass, as the "filter" measurement shows.

The second response measurement was taken with the SK-6 set for moving-coils (fig.6). Although the bass equalization remains similar to that for moving-magnet, the treble range showed a greater, audibly significant shelf loss averaging -0.35dB. Clearly, the MC equalization had an overall slope which, considered over the crucial 30Hz-15kHz band, had a magnitude of 0.65dB. A mildly "rich" character is to be expected, and was indeed heard on audition. This takes the analog frequency balance still further from that of CD.

Examining the channel balance curve (fig.6 inset), the SK-6 shows excellent equalization balance between channels, only marginally deviating below 50Hz. Fig.6 also shows the frequency response via the line/CD input (dot-dashed curve), which was perfectly flat from 10Hz to 20kHz with less than 0.1dB loss at the 5Hz and 50kHz measurement extremes. At normal volume settings, the dual channel balance was within 0.2dB at 1kHz, both for MM and MC, which indicated good tolerancing.

However, the tracking of the volume control itself was surprisingly weak at low volume settings. A -60dB volume setting is not out of

court for a "loud" CD source used for low-level background music; here the channel error was a considerable 4.15dB, surprising for the class of potentiometer (probably a sample fault).

Via the moving-magnet settings, the input noise improved, as expected, to a very satisfactory -74dB (CCIR 1kHz ref, IHF input level). Some supply hum and hum harmonics are present in the MC disc noise, and can be seen in the spectrum analysis (fig.4) as the fine lines from 100Hz to 1kHz at 100Hz intervals (UK mains have a 50Hz periodicity).

The input characteristics were examined, and were found to be in broad agreement with spec. Some error on input capacitance was noted, however. Set to "moving-coil" sensitivity, the spec states "zero" but measures 380pF. However, this is insignificant for a low-impedance cartridge. For low-sensitivity "moving-magnet," the intrinsic input capacitance was 140pF (not zero), while the internal settings for additional capacitance were as specified, thus "100pF" set actually measured 240pF. The input resistance was slightly high at 49k ohms rather than 47k, while a setting of 100 ohms for moving-coil was very close at 99 ohms.

Another area we looked at was the high-frequency contour settings, which had quite a strong effect in the listening tests. These are shown as the dashed lines in fig.5, together with the low-frequency filter. As can be seen, even the 25kHz contour has quite a significant effect at 15kHz and 20kHz, "sweetening" the top end by 2.3dB. These filter contours should be used with caution if the whole tonal balance is not to be disturbed.

On test, the line/CD circuit measured well with: a perfectly flat wide-band frequency response; negligible distortion, either harmonic or intermodulation, being better than -80dB or 0.01% from 20Hz to 20kHz; respectable noise of -81dB (CCIR 1kHz ARM, 0.5V out); and excellent channel balance and separation. The latter hit a high of 110dB at 1kHz. A sensible input impedance of 33k in parallel with 150pF was noted, while the sensitivity was to specification, showing a gain of either 20dB or reduced by 6dB to 14dB, where a more sensitive power amplifier is in use. As claimed, this preamplifier preserved absolute phase, and was non-inverting via all inputs including disc. In agreement with the specification, the main output impedance was a moderate 400 ohms, providing up to 12V rms before overload.

Channel separation was not so good in absolute terms via the disc input, reaching 68dB at 1kHz and reducing to 57dB at 20kHz. These figures are considered to be more than satisfactory, however, exceeding the performance of available cartridges by an ample margin.

Summarizing the lab performance, the results for the line amplifier were technically beyond reproach, save for the low-volume setting channel imbalance, which was probably an isolated event.

In an ideal world, the signal/noise ratio could have been still higher since it was 10dB or so poorer than equivalent CD sources, while the main output impedance could be lower in order to drive long interconnect cables to multiple power amplifiers.

The analog disc input worked well at normal signal-input levels, but showed signs of high-frequency slew limiting when driven near its performance boundaries. It was weaker than average in this respect, and the "moving-coil" input noise could also have been lower. It was not really quiet enough in terms of noise and residual hum for compatibility with lower-output moving-coil cartridges. Care should be taken when matching the SK-6 with a cartridge to obtain the best results.

As regards the build quality, this was a first-

rate piece of professional work. Feel and finish were excellent, while both component and construction quality should guarantee a long working life. In any case, the generous three-year guarantee is worth noting.

Conclusion

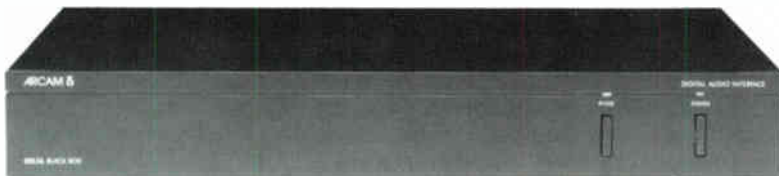
In early 1989, should we expect a \$1450 line preamplifier to meet the demands of a \$4000–5000 CD source? I think we should, and pre-amp designers are going to have to work harder on their line stages in future.

Does the SK-6 measure up to this exacting standard? Pretty much so. I found the Klyne SK-6 to be a fine preamplifier: well-built, basically well-designed and well-engineered. It was a shame, therefore, that the review had to begin with a substandard early production sample. However, the significant improvement achieved with the second model proved that it was all worthwhile. The SK-6 offered a neutral, unflappable performance that was sympathetic to the musical message, offering fine stereo soundstages. Although not outstanding in any particular respect, nothing drew attention to itself; the result was a relaxed, coherent presentation. You owe it to yourself to audition the SK-6 if you're shopping in its price range.

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ARCAM DELTA BLACK BOX D/A CONVERTOR

John Atkinson



Arcam Delta Black Box digital processor

16-bit, 4x oversampling D/A converter. One coaxial digital input conforming to the Philips/Sony serial two-channel data format (a replacement card to accept DAT will be available for \$149, as will an optical input card). Two analog outputs. Frequency response: 10Hz–10kHz ± 0.1 dB, -0.4 dB at 20kHz. Channel balance: ± 0.1 dB, $\pm 0.5^\circ$. S/N ratio: 101dB unweighted, 110dB CCIR/ARM, 111dB IEC A-weighted. Channel separation: 100dB at 1kHz. Maximum output level: 2.2V rms (Direct Output); 0.8V rms (Line Level). Output impedance: 30 ohms (Direct Output); 500 ohms (Line Level). Dimensions: 17" (430mm) W by 2.5" (64mm) H by 10.4" (265mm) D (not including connectors). Shipping weight: 11 lbs. Price: \$650. Approximate number of dealers: 30.

Manufacturer: A&R Cambridge Ltd., Pembroke Avenue, Denny Industrial Center, Waterbeach, Cambridge CB5 9PB, England. **Distributor:** Audio Influx Corporation, PO Box 381, Highland Lakes, NJ 07422-0381. **Tel:** (201) 764-8958.

As explained by Ken Kessler elsewhere in this issue, the English A&R Cambridge company made their name by producing one of the UK's most successful integrated amplifiers, the 40Wpc A60. This neatly styled model was in production for a decade or so and was the basis for a large number of good-sounding but inexpensive audio systems. These days, the company, whose products in the US sell under the Arcam banner, is a major British hi-fi manufacturer, with a product line that includes integrated amplifiers, tuners, loudspeakers, cartridges, and even a CD player. A&R was, I believe, the first UK manufacturer to obtain a player-manufacturing license from Philips, and with the product under review here, has broken new territory for a supposedly "audiophile" company in having a custom LSI chip manufactured to their own requirements.

The Delta Black Box, designed by A&R Cambridge's Mike Martindell, is a stand-alone DAC for use with CD players equipped with a coaxial digital output or with the new generation of CD transports soon to reach these shores from Japan. At present, the Black Box has one digital input, in the form of a standard RCA phono jack that accepts a Philips/Sony standard, 44.1kHz-sampled, multiplexed two-channel, digital serial datastream. A&R recommends the use of 75-ohm characteristic-impedance coaxial cable to connect the player's digital output to the Black Box, supplying a 750mm (29.5") lead with the unit. They counsel against the use of conventional interconnects to carry the datastream, and for those who want to place the transport remote from the DAC box, recommend 10m (33') as the absolute maximum cable length. Next to the coaxial input jack on the rear panel is a hole for a second input connector, at present screened off with a rubber grommet. The input circuitry and RCA jack is carried on a small pcb that plugs into the main circuit board, and replacement boards with an optical input connector (or with the ability to take data sampled at a rate different from the CD's 44.1kHz, from an R-DAT machine for example), will be available by the time you read this review. The optical board will cost \$149. A small pushbutton next to the data input is to be left in the out position unless trouble

is encountered with a particular CD player. (Paul Miller, for example, noted in the May 1988 issue of *HFN/RR* that a Technics SL-D990 CD player didn't have a suitable output format.) Pushing this switch in can sometimes help in these circumstances.

The right-hand interior of the slim aluminum enclosure is dominated by two transformers, one each for the digital and analog sections, with a pair of small printed circuit boards attached to the front panel carrying the on/off switch, a switch to change signal polarity, and two rectangular LEDs. The left-hand LED shines green to indicate correct polarity, or red if the polarity has been inverted. All the 110V wiring and switching, including an internal fuse, is well-insulated and safe from prying fingers when the cover is off.

Nearly all the circuitry is carried on one large, double-sided pcb to the left of the transformers, the only exception being the small data input board. The incoming datastream's 5.6448MHz clock frequency is extracted and synchronized with the 11.3MHz system clock, the latter produced by a phase-locked voltage-controlled oscillator. The serial data words are then taken to Arcam's "Black Chip," this a 1000-gate ASIC (Application Specific Integrated Circuit) NGA35037 chip that replaces on the order of 25 conventional CMOS chips. This IC, unique to Arcam, separates the subcode data from the serial datastream, as well as setting the flags indicating whether the signal is pre-emphasized and whether an error is present. It then arranges the interleaved left/right audio data in a form suitable for feeding to the next stage, the 4x-oversampling digital filter. The inversion of the data bits, which as explained in November 1988 (p.110) has the effect of inverting the polarity of the signal, the absolute phase, is also performed in the Black Chip's output register. By having all this digital house-keeping implemented within one chip, Arcam explains that the amount of radiated RF hash is kept down to a minimum, as well as improving reliability and reducing the parts cost.

The digital filter is the latest version of Philips' SAA7220P/A chip, which also performs the error correction and interpolation, and the resultant stream of 176kHz-sampled L/R data

is taken to a selected Philips TDA1541A twin 16-bit DAC (the only chip to be socketed to allow easy replacement). Unusually, this is placed on a piece of pcb real estate almost totally isolated physically from the rest of the board; it is also independently supported by four sorbothane bushes to give a degree of isolation from vibration. It appears from an inspection of the board that every building block in the digital circuitry—system clock, Black Chip, digital filter, and DAC—has been given its own regulated line, a total of three three-pin LM7805 voltage regulator ICs being present to supply +5V rails, with an LM7915 and an LM337 to provide -15V and -6V rails for the DAC.

The two current outputs from the TDA1541 are taken to a current-to-voltage convertor constructed from discrete transistors running in class-A, then to an all-discrete, two-stage output circuit, which also applies the de-emphasis via a FET-switched network, when appropriate, and the final low-pass filtering, this with a three-pole Bessel characteristic. There are no output coupling capacitors, DC-servo circuits constructed around a pair of LF411 op-amps keeping the outputs at ground potential. A relay mutes the outputs upon switch-on, the muting lifting after about three seconds, while both pairs of output jacks are gold-plated. The analog circuitry is powered with $\pm 12V$ from a complementary pair of discrete-transistor voltage regulators, these attached to a small heat-sink at the rear of the enclosure.

The quality of construction is to a very high standard, with a rational layout, a star-grounding topology, and much use made of metal-film resistors and polypropylene- and polycarbonate-dielectric capacitors.

The sound: The fundamental system used to assess the sound of the Delta Black Box consisted of the following: Celestion SL700 loudspeakers, sitting on their own spiked stands well away from room boundaries, were driven by a pair of VTL 100W Compact monoblock amplifiers, and were bi-wired with Monster M1 speaker cable. No active preamplifier was used, all signals being routed through the Mod Squad Deluxe Line Drive reviewed last month and since purchased as a line-level reference. A Marantz CD-94 CD player was used as the source transport to provide data for the Black Box to handle; it also fed the expensive Sony DAS-R1 D/A converter unit reviewed by J. Gordon Holt

in December. The Precision Audio DV1C-471 player reviewed last November was also used as a reference. Interconnect was Audioquest LiveWire Lapis, and I did all my auditioning from the Black Box's higher-level pair of output sockets, this enabling the Line Drive to be used with its volume control around the 3 o'clock position. All the players were isolated from vibration with Audioquest Sorbothane feet.

Arcam recommends a two-hour warm-up time before the unit is capable of sounding at its best. I actually left it plugged in and switched on for about 24 hours before I did any serious listening. The following CDs were used for the formal listening tests: Beethoven piano sonatas, John O'Connor, Telarc CD-80118; the *HFN/RR* Test CD; Mahler Symphony 5, Bernstein, DG 423 608-2; *I Was Glad: Cathedral Music by Parry*, Hyperion CDA66273; *Back in the High Life*, Steve Winwood, Island; *West of Oz*, Amanda McBroom, Sheffield Lab CD-15; and *Aerial Boundaries*, Michael Hedges, Windham Hill WD-1032.

Compared with the Marantz CD-94, the sound of the Black Box was less mellow but also with less of a sense of "leading edges" to the sound of piano. There was a lower-mid-range/upper-bass softness to the British sound which occasionally obscured detail in fast left-hand passagework on the piano. However, the way in which instruments were placed within the soundstage was almost as delicately defined as with the Marantz. The opening of the Mahler symphony was a little more brash in the upper midrange than with the Marantz, pushing the image forward toward the listener a little, but the stereo stage was nevertheless presented by the Box in a convincing manner. The Michael Hedges album, for example, was reproduced with a quite tangible solidity to the multifarious guitar images.

The Precision Audio player impressed me last November with its ability to retrieve and present fine detail without acquiring too forward a treble balance, in this respect being reminiscent of the excellent Mod Squad Prism player. In comparisons with the Arcam Black Box, the Precision Audio consistently gave a weightier left hand to the piano, which was also better defined, even when compared with the Marantz. The Precision Audio's low frequencies had less body than the CD-94, however. The American Magnavox mod seemed to have a tad more HF energy but was less brash in the

midband than the British machine. The Arcam still excelled, however, when it came to soundstaging, the sense of space on the Parry recording being unequalled by the other two Philips-system machines.

The comparison with the eight-times-the-price Sony, a true Class A piece of electronics in my opinion, revealed the Black Box for what it was: excellent, without being outstanding. The Sony revealed just that little bit more of the acoustic on the dry DG Mahler recording, placing instruments more securely in what there was of a recorded soundstage, while details of instrumental tone color were, again, just that bit better revealed, particularly in the upper bass.

Listening to Amanda McBroom's "Dorothy" track revealed major differences between the four decoder sections. The Precision Audio was the lightest in tonal balance, with a clean, clear sound, its retrieval of detail only being rivaled by the big Sony, which overall scored highest in all four areas: tonal accuracy, clarity, soundstage dimensionality, and musicality. The Marantz was noticeably more mellow, with a fatter bass guitar. Despite its more laidback nature than either the Sony or the Precision, its presentation of detail was thorough, even if you had to listen harder. The drums, however, were more three-dimensionally presented by the CD-94. The Arcam fell halfway between the Marantz and the Precision Audio in tonal balance, its bass being not as full as the Japanese player and its treble being less wispy than the American. Its soundstage presentation was also more shallow than either the Marantz or the Sony, but none of the four was any slouch in this area. It was in the upper midrange where the Arcam was noticeably less good than its (higher-priced) competition, the impression of a slightly brash nature gained in the earlier auditioning being confirmed.

The Black Box impressed me, nevertheless. Comparable in overall quality with the Precision Audio, it didn't fall too far short of the high Class B sound offered by the expensive Marantz CD-94. It offers high-end sound for the audiophile on a budget stuck with an obsolete CD player possessing a digital output.

Measurement: The measured output impedances were pretty much to specification, at 27 ohms (Direct) and 495 ohms (Line), as was the frequency response, which measured -0.2dB at 4Hz and 20kHz, with only the merest hint

of ripple in the top octave. Although the maximum output level from the direct sockets was 2.18V, as specified, that from the line-level sockets was a little higher at 1.05V. This is inconsequential, however, the 6dB reduction in output being sufficient to avoid overload problems with some older preamplifiers. As the analog output circuitry uses a DC servo to eliminate voltage offsets, I checked that, indeed, the outputs were at ground potential. They were.

Low-level linearity was among the best I have measured for a machine featuring the Philips 16-bit chip set, at $-0.3\text{dB}/-0.4\text{dB}$ (L/R) and $-4.7\text{dB}/-5.7\text{dB}$ (L/R) at the dithered -80.77dB and -90.31dB levels respectively. Listening to the fade of the dithered 500Hz tone from -60dB to -120dB on the CBS CD-1 test disc revealed a relatively pure tonal quality, which acquired a buzz of what sounded like mainly even-order harmonics as it approached, then went below -90dB . It was not quite as good as the Marantz CD-94 in this respect, which had a purer tone, though the more expensive machine did sound as if it had a slightly higher HF noise floor. Both sounded slightly cleaner than the ultra-expensive Sony DAS-R1, which had lower noise but more audible high-order harmonics. The waveform of the undithered 1kHz tone (which is described by just the digital words for the levels $-1, 0,$ and $+1$, *ie*, the equivalent of 3 LSBs) was rather asymmetrical, the positive-going half of the duty cycle lasting twice as long as the negative-going.

Looking at the $\frac{1}{2}$ -octave spectrum of the noise and spurious present while the Black Box reproduces the -90.31dB dithered 1kHz tone on the CBS test disc (fig. 1),¹ the 1kHz tone can be seen at -96dB , reproduced approximately 5.5dB too low in level. Its second harmonic can be seen at 2kHz, and there is also a hint of fourth harmonic present, though higher-order harmonics, if present, are swamped by the general rising level of garbage in the top two audio octaves. (I assume that although this HF noise does contain a contribution from the

¹ As the code representing this tone has had dither applied when the CD was cut, it should reproduce as a pure, if noisy, sine wave. Any distortion components present, therefore, can be laid at the door of the individual player's decoder and electronics. As this graphical representation of a player's low-level performance is more informative than a straight statement of by how many dB it compresses or expands the level at -90.31dB , I think that from now on we shall make this measurement (an average of an arbitrarily decided number of sample spectra. 11) a standard feature of *Stereophile's* CD player and decoder reviews.

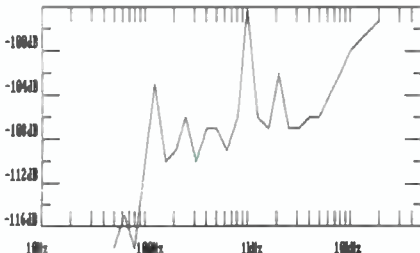


Fig. 1 Arcam Black Box: 1kHz tone at -90.31dB with noise and spuria

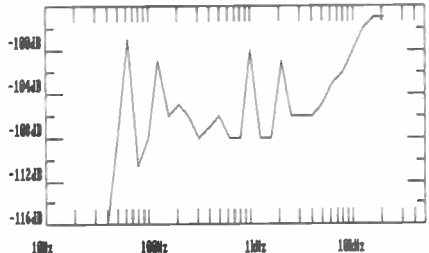


Fig. 3 Precision Audio: 1kHz tone at -90.31dB with noise and spuria

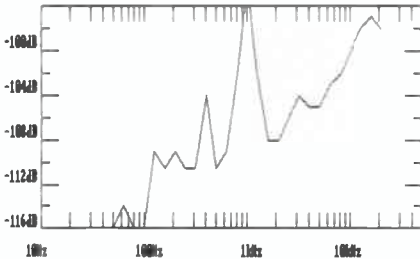


Fig. 2 Marantz: CD-94 1kHz tone at -90.31dB with noise and spuria

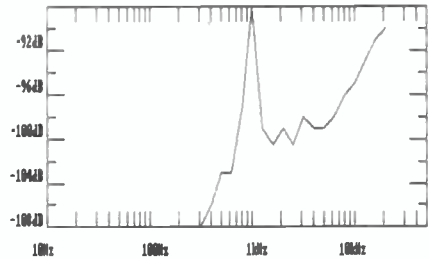


Fig. 4 Sony DAS-R1: 1kHz tone at -90.31dB with noise and spuria

higher distortion harmonics of the 1kHz tone, it is mainly due to the record dither used to ensure waveform purity when reproduced.) This ties in with the sound of the fading tone, which seemed to be even-order-harmonic-dominated in its tonality. The overall level of low-frequency noise is low, with only the full-wave-bridge power-supply 120Hz switching buzz noticeable at -103dB, its second harmonic lying at -106dB. This noise may have been measurable, but it was totally inaudible.

Follow-up: Figures 2, 3, and 4 show the 1/2-octave analyzed noise floor accompanying the dithered 1kHz tone for the three recently reviewed players that I had available for comparison with the Delta Black Box: the Marantz CD-94, Precision Audio DVIC-471, and Sony DAS-R1. (These were reviewed in October, November, and December 1988, respectively.) The Marantz (fig. 2) shows an error of approximately -3.5dB at -90.31dB, with its third harmonic just apparent, and 120Hz power-supply noise significantly lower in level than the Black Box. (Why the 400Hz band is raised I do not know.) When I reviewed the Precision Audio modification, I was unable to determine the level error at -90.31dB due to the level of noise. Looking at fig. 3, it can be seen that supply-

related hash is higher in level than the other three machines, but also that the 1kHz dithered tone reproduces 10dB too low in level, with almost as much second harmonic as fundamental apparent. You will remember that I did note the pitch of the tone effectively doubling as it passed through the -90dB level—this is a DAC/digital-filter problem peculiar to the particular Magnavox '471 sample used as the basis for Precision Audio's modification.

Finally, fig. 4 shows that the Sony DAS-R1 that so impressed J. Gordon Holt last December features exactly 2dB of compression apparent at -90.31dB—a little worse than I had previously assessed using a 'scope, but still excellent—meaning that the scaling for the graph had to be raised by 8dB. (Bear this in mind when making comparisons.) Though the 1kHz peak is well-defined, peaks can be seen at its second, third, and possibly fourth harmonic. LF noise, however, was at least as good as the Marantz in absolute terms, and more than 6dB better with respect to the level of the fundamental. That the HF noise is a function of the recording and not the players can be seen by the correlation of the former's absolute level with that of the 1kHz tone.

Conclusion: According to the 1988 *Audio*

Equipment Directory, 84 current CD players have coaxial digital data outputs while 34 have fiber-optic outputs. The majority of these are, of course, their manufacturers' premium models which many will feel do not require the services of Arcam's Black Box. A large population of older models with digital outputs also exists, however, and the Black Box will represent a worthwhile upgrading in sound quality for these. The 14-bit Magnavoxes, for example, would benefit sonically from being used with a thoroughly modern decoder. I am also informed that the 1989 crop of Japanese portable players will have a digital output, Kenwood being the first to introduce such a model. The portable can therefore be used at home with the Black Box to provide high-end but budget-priced sound quality, and used as a stand-alone machine on the road.

My only gripe was minor: The absolute

phase switch is very welcome, but I do find it most useful to be able to switch at the listening position. The usefulness of this facility was therefore much reduced for me, though I assume that adding IR remote control for just this one function would add a disproportionate amount to the price.

To sum up, Arcam's Delta Black Box is constructed to a high standard and offers excellent sound quality at what is actually a relatively affordable price. Perhaps a little too forward in tonal quality for some tastes, with a slightly brash upper midrange and a soft upper-bass register, these aspects are outweighed in my opinion by its excellent presentation of recorded soundstages, which have, as the Audio Cheapskate's immortal cliché would have it, a "palpable presence." Recommended in the lower half of the Class B category of *Stereophile's* "Recommended Components." **S**

THE CARTRIDGE CHRONICLES, PART 1

Thomas J. Norton

Introduction

The vinyl LP has always been a clunky kludge at best. How would *you* have reacted to Tom Edison as he attempted to explain his brain-storm? "Tom, old buddy, how's the wife and kids? Good. And the inventing business? What's that you say? You've got something new in the fire? A talking machine? Ah, I see. Come on now, Tom—you're pulling my leg, right? I mean, the electric light was neat and all that, but what good's a machine that talks? Ah, I see. Tom, I'm finding this all a bit, you know, futuristic. Twentieth century stuff and all that. Howzit work? I see. I see. I see. A needle, huh? Megaphone? Tin foil? Uh huh. And it makes sound. Mary had a little lamb. Mary had a little lamb? Tom, I don't think people will pay money for Mary had a little lamb, if you catch my drift!"

The digital crowd may have it right after all. Viewed impartially, and without consideration of sonic pros and cons, the compact disc is such an *elegant* and complex way to store and reproduce sound. High-tech with a flourish. Usable anywhere, thanks to disc-people and multi-disc in-car CD changers with enough

selections available to require a computer with a database to keep track of them. Aside from the possibility of massive degeneration from CD rot (the ultimate computer virus?)—very unlikely in my view—the little silver discs are here to stay. Or at least for 20 years or so until the next format revolution.

But kludge or not, if Tom Edison were alive today he would be stunned by the state of development of his invention. The basic system may be the same—a stylus valiantly ricocheting its way through a groove engraved in an impossibly fragile material. The CD is clearly quieter, more convenient, and arguably superior in bass quality and sheer dynamic range. LPs *do* require more careful handling and overall care and will, inevitably, show some signs of wear—though less than you might expect. But the fact is that the black vinyl disc can match or better the CD in sonic particulars which are of critical importance to the serious audiophile. Certainly the makers of phono cartridges are not giving up on the LP format. It may very well pass into history, but not without a fight. The four pickups I have lived with over the past several weeks are in the front lines. In a follow-up to this survey in the near future, several other pickups—less expensive than these—will be examined.

1 In actuality, the invention of the phonograph predated the electric light by two years (1877 and 1879). But why spoil a good story with an inconvenient fact?

The inevitable question each reader must ask is "How much can I or should I spend on a phono cartridge at this stage of the audio art?" CDs and CD players *are* getting better. They certainly can't be ignored; it is getting more and more difficult to obtain a desired recording in the LP format. I suspect most readers have shared my experience of longer, more frustrating searches through smaller and smaller LP record bins, only to go away empty-handed. (My local Tower Records outlet now has significantly more shelf space devoted to laser *video* discs than to classical LPs.) Do you already have a large collection of valued vinyl? Are you willing to endure the hunt for a diminishing supply of LP pressings? Are the ablations required to get the best (and the longest life) out of your black discs becoming a burden in the hands-off digital era? If (as they say in the Sunday supplements) you answered Yes to the first two questions and No to the last, you'll want to keep with the best you can afford in analog playback equipment.

And the best will cost you. A high-end phono cartridge is expensive in cost and upkeep—it has a shorter life span than any other component, dramatically shorter if not handled with care. This delicate, precision device is definitely not recommended for a household with multiple, casual users. If you cannot treat it with care, you'll have more peace of mind with a modestly priced pickup. It doesn't *have* to be used with super-priced associated equipment, but I cannot envision too many \$1000 pickups being plugged into \$500 receivers. Maintain a sense of proportion. If you plan to use a modest (say, sub-\$1500) preamp with an expensive moving-coil pickup, try to audition the two together if at all possible.

That raises the subject of moving-coil step-ups. It is possible to plug a low-output moving-coil cartridge directly into a high-level phono stage, loaded with 47k ohms, and obtain sufficient output—with some preamps. But the noise level may or may not be satisfactory, depending on the preamp gain and the cartridge output. And the sonic effect on the cartridge of a high-impedance load is unpredictable. Of the cartridges tested here, only the van den Hul is available in a special version (\$1175) designed to feed a 47k ohm load (and it has the highest output of the group). The sample auditioned was the standard model configured for a low-impedance load, and was terminated into

80 ohms (as were the others). All four of the cartridges were auditioned through the moving-coil input of the Klyne SK-5a (with its optional high-frequency compensations switched out).

Associated equipment used for all evaluations included the Well-Tempered Arm, VPI turntable (this time *sans* the mat I have used in previous tests), Klyne SK-5a preamp, PS Audio 200cx power amp, and B&W 801F Matrix loudspeakers on 11" Sound Anchor stands. (The production version of these stands is about 4" shorter. I'll have more on this subject at a later date.) Interconnects were Monster M-1000, speaker wire Monster M-1 (mono-wired).

VTA was adjusted as required—the final setting generally ranged from parallel to the record to just slightly rear-end down. Within this narrow range it was not extremely critical for any of the pickups. The small clearances between the cartridge body and the record on both the MC-One and the Genesis 500 made more than slight rear-down settings impossible (see more on this in the specific reviews).²

Measurements were made with the spot frequency bands on the new CBS STR-330 test disc, backed up by the older CBS STR-100. The latter generally showed a greater high-end rise than the former in the frequency-response readings, and the results presented in the reviews are those given by the more recent recording. Test-record results provide useful information, but they are not an absolute. Test records from different sources invariably give slightly different results. STR-100 was used to assess crosstalk, and trackability was measured at 300Hz using the Audio Technica AT 6605 (MI 1261) test record.

The Well-Tempered Arm was chosen for these reviews because it is known to be well suited to a wide variety of pickups. All of the moving-coil pickups here are moderately low in compliance. Such pickups are generally happiest with a medium- to high-mass arm. The WTA is considerably lower in mass than would be optimum, but its heavily damped design more than compensates, providing control of the low-frequency arm/cartridge resonance inevitable with any arm. There is no such thing as a universal arm, but the WTA appears to

² The Krell also had marginal clearance in the front, but its physical design allowed for increased clearance in the rear. Its wide front edge did, however, make occasional grazing contact with the thick outer-edge beads on some pressings. I intend to look more into the subject of cartridge/record-surface clearance, possibly in time for Part 2 of this report.

come as close as any. It proved a rewarding choice, but the sound quality you will obtain with any cartridge will depend to some extent on the arm. This is especially true at the low end, where arm/cartridge matching determines, to a large degree, the quantity and quality of bass obtained. My thanks to AB, who loaned me his WTA—shipped across country via pony express. Used along with my sample, it made cartridge comparisons a breeze. Two cartridges could be set up beforehand, complete with all adjustments, then interchanged by merely removing one arm assembly from the pillar and substituting the other. A change of leads, readjustment of VTA, and (careful) resetting of the volume level, and *voilà*—near-instant (well, a minute or so) changeover.³ The wiring of the two arms did appear, visibly, to differ slightly (AB's arm is about a year older than my sample—both are, I believe, newer than JGH's). This did not seem to make any significant sonic difference, but if pressed I have to admit to a slight suspicion that the newer arm was a bit more open. Where there was any doubt, a given pickup was auditioned in both arms.

It's hard to argue against the kind of performance that the best of these cartridges deliver. The price of admission is steep, but you can pay even more. (Two of the models here are not even at the top of their respective lines, though they're hardly budget specials). I am not yet convinced that pickups which sell for substantially above the prices commanded by this group will buy you a dramatic increase in performance in all areas. In Part 2 I hope to discover if you can come close to this level of performance for significantly less. In the meantime...

van den Hul MC-One: \$1075

The MC-One has already earned its place on our Class A "Recommended Components" list. I am not about to tell you that it's overrated. It is not. If I had to pick a single word to describe its character, that word would be "refined." It simply refuses to exaggerate or convert the signal engraved in the groove into a Technicolor distortion of the real thing. If you want a cartridge that screams "Detail!," picks you up and throws you around the room, and otherwise insists that *it* is in command here, you won't

find it in the van den Hul.

No cartridge is perfectly neutral—and judging the absolute neutrality of any such device is beyond the ability of any designer or critic. Even a direct comparison with the master tape will not tell you; there's many an obstacle between tape head and even the best test pressing.⁴ But we *can* make a reasonable judgment of a pickup's relative neutrality over a wide variety of good-quality recordings—both audiophile and commercial—and in comparison with its peers. On this basis, the MC-One strikes this reviewer as just a shade softer than neutral. It is an extremely sweet and (dare I say it) musical device. Its sheer listenability grows on you rapidly; its cohesiveness and coherency are exceptional.

But don't be misled by what I've just said. The MC-One may not have any obvious "hi-fi" character (rock fans, in particular, may desire a bit more "bite" on some recordings), but it is anything but bland. It is, in fact, superb at rendering fine shades of detail. I have referred to *Musique Arabo-Andalouse* (Harmonia Mundi HM 389) in previous reviews; it is a superlative recording with a broad variety of delicate (and not so delicate) high-frequency details, largely percussive in nature. These details can be easily smeared into a homogenized brightness. Not with the MC-One—it perfectly captures the exotic qualities of these instruments while preserving their individualities.

Through the midband, the van den Hul is open and transparent. The word "palpable" is much overused in audio reviews, but no other adjective better describes the sound of this cartridge in its reproduction of the human voice. The balance of lower-midrange body and upper-midrange-HF resonance is excellent; male voices are warm without excess upper-bass weight. There is a clarity throughout the midrange that is striking without being pushy. A quality that invites—and rewards—attentive listening.

The low-frequency response of the MC-One is also first-rate. Mounted in the Well-Tempered arm, it is deep and well-defined. It falls short of the Krell in ultimate resolution and drive, however, being just slightly soft with a bit of midbass warmth. Its low end is not as striking as its midrange, and is unlikely to disappoint.

³ Velcro fasteners from Radio Shack mounted on the terminal block of each arm and the rear of the turntable base made for an easy swap there, also.

⁴ Having the master tape as a reference is not without some value, of course, but I feel its usefulness as an absolute test has been overstated. A cartridge can only tell you what is engraved on the disc, not what *should* be engraved there.

It would be surprising, given its other qualities, if the MC-One failed to perform in the reproduction of soundstaging. On the best recordings, its imaging and depth are convincing. *For All the Saints* (Wilson Audio W-8110) has a stunning sense of depth from left to right, fully realized by the van den Hul. The delicate lead-in wind chimes on the initial cut of the soundtrack of *Misbima* (Nonesuch Digital 9 79113-1 F) were clearly differentiated in space, with their leading-edge transients subtly but definitely "there." Three-dimensionality of individual instruments was superb, contributing substantially to the aforementioned "palpable" quality throughout the midband.

Unfortunately, I was only able to compare the MC-One with the Krell and Audio Technica cartridges. Shortly after completing those comparisons, its cantilever started to collapse, causing the body of the cartridge to contact the disc. After about 150 hours of use, end of test—not a reassuring outcome. A call to Transparent Audio indicated that the tracking force (1.55 grams as measured on the Shure gauge) may have been too high, causing suspension failure. Perhaps a slight inaccuracy in the Shure gauge? In any event, they recommended a tracking force of just under 1.5 grams. I should point out that I had briefly experimented with 1.8–2.0 grams during the trackability check.⁵ Transparent Audio agreed to exchange the pickup for a new one (the test sample is my own, not a loaner). I will report on my experiences with the new cartridge. I have not, incidentally, heard of any other experiences of this nature with the MC-One, and Transparent Audio appears ready to stand behind it.

Measurements: The frequency response of the MC-One had a slight downward trend across the band, up about +1.5dB below 200Hz and smoothly dropping to -1.2dB down at 4–5kHz. The response rose slightly to -0.3dB at 8kHz, dropped off again to -0.8dB at 12.5kHz, then rose to +0.5dB at 20kHz. Altogether, a very linear response, with both channels closely balanced. I should point out that, after the cantilever initially failed, it recovered briefly before sagging again. During this grace period the response at the HF was down an additional

1dB, but the channel match remained good.

Channel separation was 25–30dB from 50Hz to 6kHz. Tracking at 1.55gm was good up to 70um, with slight mistracking noted at 80um. The MC-One tracked 80um at 2 grams, but that tracking force, based on my experience, is not recommended. Nor does the manufacturer recommend it. Subjectively, there was no difference in tracking at the increased force.

Conclusion: The MC-One is not a perfect pickup—no pickup reviewed here is without weaknesses. Each has its own strengths—qualities not found to the same degree in the van den Hul. But since the perfect cartridge is not to be found here (does it exist?), the choice is up to the reader: Which pickup best fits each reader's requirements? The MC-One is superb in nearly every respect. Some may find it to be a shade too sweet—the antithesis of the classic "moving-coil sound"—and want a bit more punch and sock. If so, read on. But the MC-One deserves its top-rank reputation.

Krell KC-100: \$700

The Krell KC-100 (for Krell Cartridge?) is, along with its more expensive stablemate, the KC-200, a bold move into a new product area for Krell. They have been (and still are, to my knowledge) the distributor of the Koetsu line of pickups, but this is the first such device to carry their logo. Krell is also moving into digital with Krell Digital—an offshoot of the parent company. But they are clearly a long way from abandoning analog.

The "economy" model in the Krell cartridge stable, the KC-100 nevertheless comes delivered in its own miniature "vault"—a heavy, machined, gold-anodized case, complete with screw-down lid. Cute. But more to the point, the KC-100 differs from its more expensive stablemate



Krell KC-100 cartridge

⁵ If slightly too high a tracking force can cause actual premature cantilever-suspension failure, this is indeed a new one on me, and rather alarming. Physically, it should not be possible. I honestly suspect some inherent flaw in my sample.

in its cantilever material (aluminum, to the KC-200's sapphire) and finish (black-anodized *vs* clear aluminum). The Krell is a heavy cartridge, at 13.5 grams, twice as massive as the van den Hul—I had to use both counterweights of the WTA to counterbalance it. Its round body promised problems for the alignment procedure, but its flat front, combined with the near-front position of the stylus (making for precise cueing), was adequate compensation. The only ergonomic flaw—and it's a potentially serious one—is in the design of the stylus guard. When it's in position, access to the cartridge-mounting holes is blocked. You have to remove the guard throughout the mounting procedure—and the round, smooth, relatively heavy MC-100 is a bit tricky to grip securely. The stylus doesn't protrude very far out of the cartridge body, and the exposed portion of the cantilever is short, but there is a potential for catastrophe. Unless you're adept at mounting pickups *and* very sure-fingered, I'd recommend letting your dealer do the mounting chores.

The Sound: This is embarrassing. Critics' comments aren't supposed to agree with manufacturer's ad copy. Yet there it was, in black and white: the Krell literature claims a robust, dynamic sound, with a "wide, deep, and focused soundstage." Yes, I had read that copy months ago, long before I even received the KC-100 for review, and had stashed it away, along with my other files of literature, for possible future reference. Fast-forward a few months as I review my listening notes on the Krell cartridge: references to a dynamic, lively, open sound. A solid midbass, detailed and properly balanced—neither lean nor overblown. An especially notable sense of depth—with well-defined layering within the soundstage and a fine sense of space and expansiveness. Had I succumbed to subconscious, subliminal suggestion, Krell's siren song of passionate prose priming the pump, so to speak? *Au contraire*. Being from Missouri,⁶ I've learned to be skeptical of manufacturer's literature over the years.

But the KC-100 really does sound the way I have described it. Its liveliness and clarity reminded me of nothing less than a tamed version of a Decca pickup I owned years ago—not the well-known London, but its ancient

predecessor, the 4RC. The Decca was the most explosive cartridge I have ever owned. Hind-sight is a bit hazardous, but the Decca, colored through it was and possessed of an uncontrolled desire to turn on its owner, turning ratty and harsh at the slightest provocation from the grooves, nonetheless managed to sound more *alive* than any cartridge I have owned since. The Krell manages more than a hint of that same spark of life, especially through the vital midrange, but, unlike the Decca, it never gets reckless. Everything remains (properly) under control. The comparison breaks down (thankfully) in other respects as well. The Krell is low in coloration, with an open, detailed, clean high end. It is subjectively (and measurably—see below) brighter than the MC-One, yet never sounds hard on recordings which don't themselves have that character. But where the MC-One slightly softens the hard edges (without seeming to sacrifice detail in the process—a deft balancing act), the Krell reveals flawed material for what it is.

Kor (Proprius PROP 7770) demonstrated many of the strengths of the KC-100. The chorus was placed in an exceptionally "real" acoustic space. Interplay of the various choir sections was well-defined, and depth layering was first-rate. The low-frequency response from the organ was extended and well-defined. I found the bass of the Krell to be, in fact, consistently taut and solid.

The Krell lacks the warmth of the MC-One, its detailing being more overt though not overdone. The Krell excels in soundstaging and separation of individual details within the soundstage, while the van den Hul presents a more distinct quality of fleshed-out three-dimensionality of the individual instruments and voices within that soundstage. In the right system, either will excel. On the most basic level, the Krell will be more complimentary to a system which in other respects leans toward the warm and slightly soft; the van den Hul will be at its best in a brighter, leaner system. But neither *demand*s a close system match to provide rewarding performance.

Measurements: The KC-100's frequency-response measurements were not surprising: within ± 1.1 dB from 20Hz to 10kHz on both channels (slightly better than that on the left), rising gradually to +3dB (left) and +3.5dB (right) at 16kHz, then tapering off just slightly at

⁶ Or at least having changed planes in St. Louis a couple of times.

20kHz (+2dB left, +3.1dB right). The ubiquitous midrange dip was -1.0dB at 4–5kHz. Separation was in excess of 24dB from 100Hz to 5kHz. Tracking was objectively superb—90 μm at 1.8 grams, with one exception. Very high-level high-frequency transients—loud cymbal crashes and the like—could occasionally cause the sound to harden.

Conclusion: Altogether, a first-class beginning for Krell in its cartridge efforts. And I can promise Krell's Dan D'Agostino that I'll make a pest out of myself until I get to compare this cartridge with the KC-200 flagship!

Audio Technica AT-OC9: \$700

While the AT-OC9 bears the Audio Technica logo, you won't find a sample of this cartridge at your friendly Audio Technica dealership. The US distributor of Audio Technica products has apparently decided that their market does not include high-end cartridges.⁷ A quick perusal of the latest *Audio* directory issue (October 1988) lists the most expensive AT cartridge at \$295, with no moving-coils in sight. When I first heard of the AT-OC9, the only reasonably accessible source, short of Japan, was Audio Technica in the UK. A quick phone call and follow-up letter resulted in a review sample. Since that time, Music Hall in the US (importers of the Epos loudspeakers, among other items) has begun importing the AT-OC9 (along with the less-expensive AT-F5). Mail-order company Lyle Cartridges also stock it, I believe.

The Sound: The Cheap skate also has a sample of this cartridge, and by now may have provided a report. As I write this, I know only that he is delighted with the OC9, and it is not difficult to see why. It is an excellent pickup, the best ever from Audio Technica and one of the best from any source.

If forced to summarize the sound of the Audio Technica in a few short words, I would (after protesting that such an over-simplification is difficult) classify the Audio Technica as open and detailed, with good but not excellent transparency. The balance tends toward the analytic—a bit cool-sounding, but with



Audio-Technica AT-OC9 cartridge

enough warmth to prevent it from being too lean. Its highs are well-balanced, not at all reticent but not overbright or etched. Its dynamics are good, but not spectacular. Its deep bass is clean and solid. Depth and overall soundstaging are very good (though not quite top-caliber), the midrange three-dimensional. Its overall perspective is a bit laid-back. But the sound of the OC9 might best be characterized by comparison with the van den Hul and the Krell.

In the low end the Audio Technica falls between the slight warmth of the MC-One and the tightness of the Krell. The OC9 is neutral through the important midrange. It lacks any stunning attributes there, having neither the palpable clarity of the van den Hul nor the lively, dynamic contrast of the KC-100. Voices are a bit leaner and less fleshed-out than through the other two cartridges. In that respect it somewhat resembles the Genesis 500, but the latter cartridge is definitely the leaner of the two, with a brighter balance.

The high-frequency response of the OC9 was, in many respects, the most well-proportioned of all the pickups in the present group. But I was bothered slightly by a trace of wispieness and dryness from recordings with strong high-frequency contents. On *Ojebokoran* (Opus 3 77-04), the voices were less liquid, without the fluid clarity of the same voices through the Krell or the van den Hul. Still, the HF response of the OC9 bettered that of the Krell and the MC-One in its open, airy quality and fine, delicate detailing. The Genesis 500 was equal or better than the Audio Technica in HF transparency, without the latter's subtle dryness, but the Monster's highs were a shade too prominent.

The Audio Technica fell short of the other three cartridges in the area of three-dimensionality, and was less effective in the re-creation of a well-layered sense of depth. But not by much. I never quite received the jaw-dropping sensation of front-to-back sculpturing *occasion-*

⁷ As this copy went to press, we were informed that Audio Technica's Signet division will now be distributing the OC9 in the US. The cartridges will be subject a full quality control process and the price is expected to be in the \$600–\$700 region. —JA

ally provided by the others *on the best material*, but neither was I ever overtly conscious of a lack of three-dimensionality.

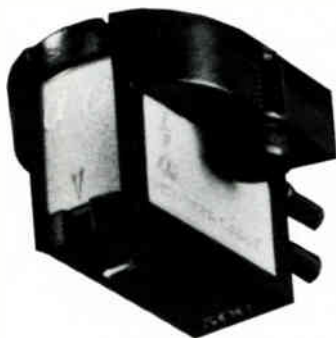
Measurements: The OC9 measured very flat—within ± 1.0 dB from 20Hz to 2kHz, -1.6 dB at 6.3kHz, rising to $+0.1$ dB at 12.5kHz, then dropping to -2.8 dB at 20kHz (right channel; the left was slightly flatter, but not significantly different—within 0.5dB up to 16kHz). Crosstalk from left to right was down 24dB from 50Hz to 5kHz (even better from right to left—down 37dB at 1kHz). Trackability at 1.5 grams was fine up to 80um, and came close to tracking 90um. Subjective tracking on program material was similar to both the MC One and the Krell—*ie*, fine, with little to choose from between them.

Conclusion: My personal ranking would place the OC9 just a shade behind the MC-One and the Krell in overall sound. It is less alive and focused than the Krell, less sweet than the MC-One, and a bit less three-dimensional than either. But I'm unable to downgrade it by much; I simply spent too many long, thoroughly enjoyable listening sessions with it for that. It may be harder to find than the other pickups in this survey, but is worth a close audition.

Monster Cable Alpha Genesis 500: \$650

The Genesis 500 is the baby brother of Monster Cable's top-of-the-line Genesis 1000 cartridge. It is almost identical in physical appearance, differing only in its use of green body trim (the 1000 sports red pinstripes). All of the functional differences appear to be in the stylus and cantilever. The cantilever of the 500 is a hollow sapphire rod tightly attached to an inner aluminum tube (the 1000 has a diamond-coated boron tube cantilever). Its stylus is a 6um x 35um line-contact (3um x 60um for the 1000). Monster claims a stylus life in excess of 600 hours for the Genesis 500, more than 1000 hours for its higher-priced sibling. This strikes me as peculiar. Everything else being equal, the smaller-cross-sectioned stylus of the 1000 should have the shorter service life. But, to its credit, the Genesis is the only cartridge in this survey making *any* claims as to stylus longevity; most manufacturers ignore the issue.⁸

The Sound: First, the good news. The Genesis



Monster Cable Alpha Genesis 500 cartridge

500 is a *strikingly* detailed cartridge. High-frequency details are dramatic—but without hardness or edginess. It is extremely clean through the top end. Bass and midbass are tight and lean—there isn't an ounce of extra fat in the sound of this pickup. Depth could, with the right recording, be absolutely stunning. (That's the word which appears in the first line of my listening notes on *For All the Saints*.) Stunning depth and spaciousness, fine detail within the choir, tight, well-defined organ. Even recordings with no audiophile pretensions could provide a dramatic sensation of depth, space, and atmosphere—my unfortunately slightly noisy copy of the *Enemy Mine* soundtrack (Varese Sarabande STV 81271) was a striking example.⁹

But I was a bit put off, in the final analysis, by the Genesis 500's balance. Not enough to override its positive traits, but enough to be noticeable in comparison with, particularly, the Krell and the van den Hul. The Monster was lightened in timbre. By this I do not mean that it lacked bass. Its deep bass was as taut and deep as any in the survey—arguably the tightest of the bunch, though with less sheer drive than that from the Krell. But instruments and voices lacked a degree of body which (as long as it isn't overdone) adds an important spark of life to the sound. The general result of this balance was to subtly shift the timbre of the sound upward, making the upper partials more prominent.

⁸ As well they might. Stylus replacement costs for all of these pickups are high. They have nondetachable stylus assemblies (as do all moving-coils). Replacement means, in effect, a whole new cartridge, for which the maker will charge you something over half of the new price. Not a bad deal, perhaps, for a whole new cartridge, but still not a negligible expense (especially for a frequent listener).

⁹ When you think about it, it's not surprising that a Monster cartridge would take to this recording.

Musique Arabo-Andalouse was highly detailed, more so than on even the best of the other pickups here, with a fine depth and sense of layering within the overall fabric. But instruments were lightened (more noticeable on the occasional non-percussive instrument in the ensemble, notably the violin). Tape hiss was more obvious. *James Galway and the Chieftains in Ireland* (RCA 5798-1-RC), a delightful recording, is usually rather subtle in sound, even slightly soft but with natural, unexaggerated detail. It was far from being overbright through the Genesis, but had a degree of sparkle which is not typical of its sound with other top pickups. Pleasing, but not entirely accurate. The chorus on *Flojten spelar-dansen gar. . .* (Proprius PROP 7759) was very open, with strikingly good separation within the chorus and excellent soundstaging, yet the male choir seemed lightened—lacking in body and less convincingly real because of it. The violin accompanying the chorus in several selections seemed tipped upward in timbre. None of this precludes overall praise (and recommendation) of the 500—it does too many other things too well. But it does, I feel, keep it a notch below the best.

The Genesis sounded best with the cartridge body raked slightly down at the rear. I would have liked to have tried a more pronounced tilt, but there was simply not enough space between the bottom of the cartridge and the record. At one point, in fact, the suspension sagged to the point where the cartridge grazed the top of the disc. This occurred at the recommended 1.8 grams tracking force. I backed off to 1.6 grams and had no further problem (tracking was fine at the lower force also), but clearance was still tight enough to encourage occasional checking.

How does the Genesis 500 compare with the 1000? On my own reference system, I cannot say, not having a sample of the latter on hand. But I did get the opportunity to compare the review sample of the 500 with a friend's Genesis 1000 on a recent trip to the East Coast. The system was unfamiliar, but hardly modest: VPI turntable, Eminent Technology arm, modified Adcom electronics with bi-amped GFA-555s driving Infinity 9 Kappas. The sound was, at the same time, brighter and less forward than on my own system, with a stronger deep bass but noticeably more prominent midbass. Large-ensemble material at high levels was more exciting and dynamic than on my own system,

small and medium-scale material slightly less three-dimensional. I found the added HF output of this system bothersome at first, but adapted to it so long as the volume was kept within bounds. Through this setup the timbral balance of the two cartridges was very close; sibilants on both were more prominent than on my own system. Some recordings favored one cartridge, some the other, but the differences were not in any way dramatic. The minor differences, such as they were, tended to *slightly* favor the 1000. I'd need longer listening exposure, using more familiar components in a more familiar environment, to fully sort out these differences.

If you do find the Genesis 500 to be your cup of tea, should you hold out and save up for the 1000? I'm inclined to say yes. Better than to constantly wonder if you should have popped for the extra \$150 (the dreaded, audiophile "I wonder if I should have bought—" syndrome).

Measurements: The frequency response of the Genesis 500 (left channel) was up slightly (+0.5 to +1dB) between 20 and 315Hz, dipped gradually to -0.8dB at 5kHz, where it began rising again to reach +1.3dB at 10kHz, +4.3 at 16kHz, and +6.5dB at 20kHz. The right channel had more of a dip at 5kHz (-1.7dB), and a less precipitous HF rise (+2.2dB at 20kHz). The left/right HF mismatch was less subjectively troublesome than it might appear (1.7dB at 12.5kHz), noticeable only as an occasional balance shift on material with a strong HF content (hi-hat cymbal, for instance). Separation was in excess of 25dB from 150Hz to 4kHz (over 30dB at 1kHz).

The 500 tracked through 70um, registered the very subtlest trace of mistracking at 80um, and clearly mistracked at 90um. The subjective tracking was excellent; in fact, it marginally outpointed the Krell in lack of a sense of strain on high-level, high-frequency-rich material. It preserved, for example, the shimmer of the cymbal crashes on *Church Windows* (Reference Recordings RR-15), which were hardened somewhat by the Krell. The Genesis did encounter some minor LF tracking problems on *The Apocalypse Now Sessions—Rhythm Devils* (Wilson Audio W 8521). The last band of side 2 ("Hell's Bells") is a low-frequency torture test. The other three pickups sailed through it. The Genesis exhibited some minor rattling in the right channel—not serious, but clearly

audible. Recordings presenting a similar LF tracking challenge are extremely rare.

Conclusion: The Genesis has enough positive traits—detail, depth, imaging, tight bass—to make it a near-top-rank pickup. It might well be truly stunning on the right system, and some of you are going to love it. System matching will, however, be the name of the game here; the 500's light, delicate, but also bright and rather lean tonal balance requires a careful

match. And a careful match with program material also. Recordings with clearly excessive treble (and there are plenty to go around), combined with top-heavy loudspeakers, will not be an easy listen through the 500. You can't really blame the cartridge for that. Yet I honestly feel its timbre to be skewed, lacking fully natural flesh-and-blood *body*; this will contribute to undesirable results in the wrong system. Recommended, but with that caveat. **S**

QUAD ESL-63 US MONITOR ELECTROSTATIC LOUDSPEAKER

Larry Greenhill

Full-range electrostatic speaker system. Power capacity: 100W, 10V rms, 40V peak maximum signal input. Nominal impedance: 8 ohms (6.2 ohms minimum). Sensitivity: 86dB SPL for 2.83V rms at 1 meter. Dimensions: 36" H by 26" W by 6" D (base 10" D). Price: \$3990/pair. Approximate number of dealers: 50. Importer: Tovil Distributors, 14120-K Sullyfield Circle, Chantilly, VA 22021. Tel: (703) 631-8810.

Electrostatic loudspeakers (ESLs) have always held a fascination for audiophiles. The Jantzen, Beveridge, KLH, Acoustat, Stax ESL-F81s, and Servo-Static models in the late 1960s and '70s, as well as the Martin-Logans and Sound Labs of today, all promise faster transient response, low distortion, and a higher order of "transparency." Why? The driver, instead of being a cone with a mass of several ounces, is an extremely thin sheet weighing mere grams, often made of Mylar, and suspended between two charged plates. The musical signal, applied to the plates, causes the diaphragm to move. Many of the designs operate full-range, without complex crossovers and their attendant problems.

Like all exotic systems, there is a price to pay. Electrostatics, particularly the early models, are planar systems and have beaming problems. The bipolar dispersion pattern of the sound makes them very sensitive to placement. Although the low-mass membrane can move very quickly, it can not move far; deep-bass response is limited unless huge panels are used. Electrostatics require power supplies and transformers, and the impedance and phase angle of the interface can vary tremendously depending on frequency. Many solid-state amplifiers have had problems driving such complex loads. Charging the plates requires expensive,



Quad ESL-63 US Monitor loudspeaker

high-voltage power supplies, often mounted in the speaker's base.

Unreliability plagued many of the early models, arcing of the diaphragms giving a wonderful blue glow in the dark but giving the owner a sinking feeling—an expensive repair was in

the offering. This unreliability added insult to injury, as the price of these systems can be quite high. Although we are now jaded with the thought that a full-range, "all-out" speaker system can cost in excess of \$10,000, the early members of the electrostatic club in the late '60s clearly were buying then the most expensive speaker systems, at costs of several thousand dollars. All this was justified, for the dedicated hobbyist (and eventually neurotic, worried owner!) who could tolerate the expense, breakdowns, and cumbersome speaker enclosures, for these speakers offered low-distortion, non-fatiguing sound with superb imaging and detail.

Why review the Quad ESL-63 again, now presenting itself in the United States as the US Monitor? Because the Quad, now in its third version, is the longest-surviving consumer-grade electrostatic speaker on the market, if one counts the first version made in 1954. Only 11 full-range electrostatic systems are listed among the 1376 loudspeakers in *Audio's* 1988 Annual Equipment Directory, and these are manufactured by only four out of 257 speaker companies in the audio industry. Sound Lab makes three full-range ESLs and four ESL subwoofers; Acoustat offers six models; Martin-Logan has only one "pure" ESL system; and there is the Quad US Monitor. (In addition, Stax still offers the ESL-F81, F83, and the ESTA-4U.) *Stereophile's* "Recommended Components" for April 1988 (Vol.11 No.4) lists only the Sound Lab A-3 and Quad ESL-63 in Class B. For many, the US Monitor will be a serious contender for the "best" ESL: accurate, superb imaging, no crossovers, with great sonic coherency, practical size, and high reliability.

The Early Quad

The first Quad electrostatic, which remained in production for 25 years, had all the electrostat's virtues and vices. As with all of Peter Walker's products, some new principle was applied—the first Quad employed the "constant-charge" technique, which insures an even distribution of charge across the entire diaphragm. The speaker was a curved rectangular panel, with the longer sides horizontal, a look that was copied by Jon Dahlquist for his DQ-10. These relatively small panels imaged beautifully and, for me, gave the ultimate in midrange accuracy, speed, transparency, and imaging. On the other hand, it could not play

loud, had very limited bass response, and less than optimal dispersion patterns for stereo imaging. It would arc instantly (blue flame and hole in the Mylar) if you were rash enough to overload it even for a second using an amplifier that put out an instantaneous voltage exceeding 27V.

Finding the right amplifier was another part of the electrostatic owner's lifestyle. The amplifier had to be right sonically, of course, but also had to have exactly the correct voltage peak or it would literally "consume" the loudspeaker. The Quad Manufacturing company made a small solid-state amplifier, the 303, which was safe to use with their electrostat. In the early 1970s, John Curl and Marc Levinson designed another amp for the Quad panel, the ML-2. This product fit the exotic, hyper-expensive world of electrostats to a T. Sporting huge cooling fins, the ML-2 was a 65-pound, monophonic, full-duty cycle, class-A amplifier that ran as hot as a space heater, putting 25W into the speaker and 150W of heat into the room. It cost then about \$4000/pair (current special-order versions of the ML-2 are still available today from Madrigal at \$9600/pair!). The sonics of this speaker-amplifier combination were highly touted, and have since been regarded as one of the few "classic" pairs of audio components. This original Quad, for its extreme midrange transparency, did not offer as much at either frequency extreme, and required total dedication on the part of the owner. Some high-end dealers supposedly even taught their customers to repair the diaphragms themselves, using Mylar and a hair dryer!

The Quad ESL-63: the first 7 years

Peter Walker began to redesign the Quad in the early 1960s (the "63" in the ESL-63's name supposedly designates the year of the design). The new version was released at the CES of 1981, and seemed smaller because the long side of the speaker's rectangular frame was now vertical. Many exciting and clever technical inventions were incorporated into the '63 (detailed in an excellent article by Reg Williamson in *Speaker Builder*, Vol.3 No.1, pp.10-18, February 1982). The first involved a new protection circuit, offering a technically sophisticated triac clamping circuit to prevent arcing. The circuit operated by limiting the input, and when that failed, by short-circuiting the input with a

"crowbar" technique (the amplifier needed to have adequate protection against the speaker!). This crowbar circuit was actuated by an RF "snifter" that was set to sense the high-frequency noise that accompanies the ionization of air that occurs when the speaker arcs.

The second innovation was the speaker's unique radiating element, which used driver plates that employed a printed circuit board of annular rings, like the ripples formed when a stone is dropped into a lake. These rings were fed by delay lines (employing some 11 miles of wire!) which allowed the flat diaphragm to radiate the sound first at the center and last at the periphery, as if it were a radiating sphere—the ideal shape for approximating sound emanating from a point source with an apparent location 12" behind the panels. The single element in the new Quad also meant the elimination of a venetian-blind, treble-beaming effect found in speakers with multiple panels. This design meant near-perfect phase coherency, as shown by Quad's show-stopper demos in which two squarewaves, out of phase with each other, are fed to two Quad speakers. A microphone placed between the speakers shows that the two signals cancel out completely, suggesting very low distortion in the speakers.

Many of this magazine's major reviewers have made excellent and critical statements about the '63's strengths and weaknesses. Bill Sommerwerck opened with a very technical description following the speaker's first CES showing in 1981, praising "FRED" (Peter Walker's technical name for the ESL-63, which stands for Full Range Electrostatic Driver) for its natural-sounding, pristinely focused, unstrained ability to capture the acoustical space in a recording. JGH had a mixed opinion, praising the '63 for its imaging, but faulting it in other areas. He found the sound to be "warm, withdrawn, and overly rich . . . [with a] persistent dryness and slight top-end tizz" (Vol.6 No.4). The new Quads quickly shut down during orchestral climaxes, which led him to withhold his recommendation, "regardless of the sonic merits it possesses." The loudspeaker "simply did not have the power-handling capability" for program material then becoming available on CD (Vol.6 No.4). This inability to play loud turned out to be related to an altitude effect, the speaker being unable to play any louder than 97dB at the 7000' Santa Fe elevation (still, the original '63s were no rock loudspeaker, even at sea

level). Stands (Arcicis, sand-filled to reduce vibration and increase stability), subwoofers (perhaps Celestion System 6000 dual-mono subwoofers), and tube amps (Futtermans) were recommended associated components for the owner willing to go the full route.

Then came the next period in the life of the Quad ESL-63—modifications and improvements. Some were done by Quad itself. AHC carefully documented the improvements Quad made to the protection circuitry (*ca* 1983) to tolerate higher levels (fixing the clamping level and increasing the shutdown time to 4 seconds); modifying the louvers to reduce resonances (above serial #11601, new louvers are white); and the pad built into the dust cover to damp a 60Hz resonance, beginning at serial #13,041 (Vol.7 No.7). From 1987 on, most Quad ESL-63s were less dry-sounding, as noted in the speakers' description in this magazine's listing of "Recommended Components" (Class B, October 1988, Vol.11 No.10). Other mods were installed by audiophiles. The Arcici stands were substituted for the "Stand and Deliver" units offered by Quad. AHC detailed many of the other mods in a separate article (Vol.7 No.2), including capacitor bypasses, replacing the snap-in speaker-cord terminals, replacing the grille cloth, and rewiring some of the connector wire with heavier cable. Some audiophiles actually removed the metal grilles. During one CES, the highly modified '63s of Damien Martin (Spectral) had no metal grilles or grille cloth at all!

All in all, the Quad ESL-63 maintained a firm hold on its Class B listing in "Recommended Components." I purchased a pair, finding that the '63 was a big improvement sonically over the original Quads, particularly in lateral image width and front-to-back depth.

1988: Enter the US Monitor

Now the US Monitor has made its appearance and will be the only version sold here in the States. Ross Walker, President of Quad, and son of Peter Walker, the '63's designer, explained that the US Monitor evolved from a special "pro" version that had been developed for Philips' European recording division. They had requested "ruggedized" '63s that could take on-location recording, with all the moving, hoisting into trucks, and other non-audiophile types of abuse. Quad obliged Philips by replacing the '63's aluminum frame with steel, put-

ting handles on the sides, and rubber kick-pleats at the base. Philips was delighted, and soon other studios were requesting the "pro" version. Ross felt that the speaker was much more durable and rugged, and the combination of the steel frame and metal grilles truly reduced speaker resonances in the audible range. Even though its weight had gone up by 30%, it was best suited for shipment and moving about. It was decided that this model, perhaps because of its superior mechanical ruggedness, was optimal for export. Thus the US Monitor was as much a product of necessity as sonics.

The issue concerning "visible and obvious" external changes was answered directly by Ross and by Ed Gardner, Vice-President of Quad sales for the American distribution company, Tovil Distributors. I want to list the visible changes first. Turning on the AC power switch is followed by a soft click, suggesting that a relay has been added. The grille cloth is more sheer, more acoustically open. Moving the wooden top piece to the side and pulling down the grille sock reveals more differences. The metal protective grille is now flat, with large, 8mm² open spaces, in contrast to the original '63's downward-angled needle-thin slots. Like the earlier '63, the US Monitor has four horizontal panels stacked in the frame, their leads soldered together. The electrostatic sections are a bit more efficient, with reduced thickness in the printed circuit on the plates themselves to reduce the plate gap. The US Monitor's circuit boards (in the speaker's base), including the protection circuit, audio transformer, delay lines, and high-voltage transformer, look identical to those in a late-model ESL-63. With the steel frame, all these changes make it impractical for the manufacturer to offer upgrades. Alas, those of us with original '63s will have to buy the US Monitor outright to "move up"; no factory-supported upgrades can make a '63 into a US Monitor.

Quad made no audiophile-inspired changes. Walker stated that any mods would only be added if measurable improvements could be shown, and, to date, the company has yet to find a user-generated mod that helped directly. So American "tweaks" of signal-cable wiring, capacitor bypasses, and metal-screen-ectomies have been ignored by the manufacturer. Although Ross did admit that the '63s sounded a "bit more accurate" without the metal

screens, he quickly added that the company needed those screens to protect customers from the speaker's high voltages. In addition, he noted that all '63s without their protective screens become mechanically unstable and begin to vibrate at low frequencies. So those metal screens not only protect the owners from nasty 10,000V shocks, but also make the speaker much more rigid and reduce those ugly, unwanted resonances which could muddy the sound.

In reviewing the US Monitor, I had several questions in mind. Besides the increase in reliability and durability, did the speaker sound different from my stock Quad ESL-63s (serial #9010)? Could the speaker stand up to some heavyweight, high-power solid-state amps? I would hope so, for opening up the gain on my 100Wpc Threshold Stasis III (which clips at 125Wpc) quickly shuts down my early-model '63s, and the '63's "crowbar action" neatly takes out the Threshold's rail fuses in the bargain.

Setup & Listening Tests

No doubt about it, the US Monitor is more rugged in dealing with American amps. It tolerated full-tilt +3dB peaks on the Threshold (200Wpc peaks) and handled all the Levinson ML-9 could dish out (close to 700Wpc peaks, or 75V peaks!). I found that the speaker smoothly clamped the ML-9, for the sound levels did not increase (actually diminished a bit) as I advanced the ML-9 to its full output.

The listening sessions were carried out in two locations (after all, Ross, these monitors are meant to be schlepped about, are they not?). Most of my listening was carried out in my rectangular, 5400ft³ living room which sports a 12' semi-cathedral ceiling. The room's 25' length has allowed my own ESL-63s to develop impressive deep-bass levels. The speakers were placed about 5' from the back wall and 5' from either side wall. The sound in this room has always been zippy and fast, with a small peak in the 7kHz region.

The US Monitor stayed very close to the sound of the my early '63s for most vinyl recordings and CDs. The new speakers played louder than my originals, and there was an enhanced openness, particularly in the upper midrange. In addition, the amplifiers continued playing as I cranked up the volume control (my older Quads would shut down just as the amplifier's protection circuits or fuses acted). By

comparison, my older ESL-63s had a "dark" tonality. In many respects, the "intact" US Monitor (with its metal screens on) sounded like the older Quad with the screens off.¹ As a result, I heard more inner detailing, depth, and a better sense of spatial location in the new US Monitor. The US Monitor appeared to have more upper midrange and less bass than my old ESL-63s. This may represent some lack of rigidity in the older Quads that adds an added "whumph" in the midbass area, a byproduct of the less rigid speaker frame's vibration.

Image width excelled, with rock-stable specificity and needle-sharp focus in the far lateral field. Dispersion in the US Monitor was generous—it became possible to move around without losing the stereo image (no pinpoint "sweet spot"!). Two people (who were not Siamese Twins) sitting side-by-side could easily experience the speaker's superb imaging. The US Monitor has quickly become my hands-down favorite over all other speakers in reproducing the female voice. Grain is gone, and I felt I could "blow-up" (figuratively!) any aspect of the musical texture and find more detail. I find the image height is less restricted than that of the original ESL-63s. Although the Quad-supplied "Stand and Deliver" metal stands diminish the bass extension, the speakers become more accurate in the midbass when so elevated.

The US Monitor reproduced live recordings with a sense of immediacy and coherency that added greatly to their energy and realism. Billy Joel's *Toys in the Attic* was wonderful, and listenable with an immediacy I had not found before with dynamic systems. Glenn Gould's *Goldberg Variations* had transient speed and transparency, both on vinyl and CD, that had just not been apparent to me with other systems. The other element I must comment on: coherency. There was a sense that the soundfield emanated from a point, both bass and highs, so that I was not aware of separate transducers (which was accurate, for there is only one radiating element per loudspeaker).

Location Two

The second location was picked to allow for comparisons between the US Monitor and Sound Lab A-3s. The listening took place in Glenn Hart's² rectangular 15' by 24' living

room, heavily carpeted and furnished with two overstuffed couches. The Sound Lab speakers were placed at one end of the room, 3' from back wall and side wall and on either side of French doors that opened onto a porch. The 6' Sound Lab A-3s sat immediately behind the Quads for listening comparisons. Just to test the Quad's ruggedness, we used a pair of Moscode 600 amplifiers, rated at 300Wpc. The A-3s, by the way, were set up by toeing them in at 25° across the door opening. A large number of vinyl records were auditioned, using an Oracle turntable and a Koetsu Black cartridge. This was followed by a highly revealing California Audio Labs Tempest II CD player and some favorite CDs. A noncontrolled format was used, listening to each selection fully, then switching to the other speaker.

First, a caveat: The listening situation in room 2 was not optimal for the Quads. We chose to leave the Sound Lab A-3s in place because of the limited time for setup and listening. The Quads' frequency balance and imaging can be affected by placement because of the bipolar sound-radiating pattern. In many ways, it may have favored the Sound Lab A-3s, which kept the "favorable" position in the room. Even so, the Quad and Sound Labs both sounded eminently natural and smooth. The Quad imaged beautifully, producing a three-dimensionality rarely exceeded by the Sound Labs.

Vocals proved very revealing. The Quads excelled on a Philips LP of soprano Fredericka von Stade, whose voice was less shrill and strained than on the A-3s. Lou Reed's *Walk on the Wild Side* CD showed impressive front-to-back depth on both systems. The Tempest II CD player did pinpoint a possible frequency-balance shift in the Quads, perhaps due to their location in that room. On one CD of female vocals (Radka Toneff, *Fairy Tales*; Odin, BB, Oslo-Norway Records, Tottesgate), the voice took on a chestiness over the Quads that seemed to shift her entire range down. A pop vocalist, Basia, showed no changes in vocals, but the bass synthesizer took on a midbass emphasis. Using the wonderful Vanguard recording of the Weavers' 1962 Carnegie Hall Reunion ("Guanatanamera"), the voice of Pete Seeger seemed more natural and less nasal on the Sound Lab

¹ I gave up the "barefoot" ESL approach—no metal screens—when my cat began to use the old Quads as a scratching post!

² Glenn Hart, an audio writer in his own right and the Sysop of the CEFORUM on CompuServe, kindly donated time, his living room, and his Sound Lab A-3s for these tests. He also contributed valuable opinions.

A-3s; in addition, the soundstage on the A-3s was wider, and Seeger's voice was positioned further to the right.

Orchestral music showed a similar effect, with the string sound on the Quad having a very smooth, non-fatiguing quality. The A-3s, if anything, were more analytical, emphasizing inner detail. On the *Pulcinella* Suite, I heard what sounded like a pizzicato on violins over the Quads; the A-3s resolved this sound into a clear low-frequency drumbeat. In all fairness, the Sound Labs' ability to yield this type of low-end detail would be expected from its much larger panel system.

Clearly, the US Monitor had a very "civilized" character, and sounded smoother and less bright on some recordings than did the Sound Labs. We even noticed that vinyl record noise was less apparent on the Quads. (Perhaps this is in agreement with JGH's observation, in his original review. He found that the Quads were free of a 7kHz brightness often found in other "exotic" loudspeakers.) The comparison with the A-3s may be unjust, not just because the positioning favored the Sound Labs, but because the Sound Lab is a full-height, 6' curved panel speaker which costs 50% more than the Quads. Still, the A-3 is something of a standard at this magazine.

It is a great credit to the US Monitor that it was a serious contender with this much bigger, more expensive ESL. Both speakers proved highly detailed, natural sounding, and clean. The Quad excelled in a pinpoint three-dimensionality that gave the imaging solidity, while the A-3s created a very wide soundstage. On some recordings, we admired the A-3s' speed, snap, and open high end; it seemed more "correct." On others, it was amazing how the Quads, in a disadvantaged position, could generate a palpable, solid sonic image that we felt we could reach out and touch. The comparison should be repeated in other settings, however, if you decide to narrow your speaker selection to these two units. It is quite possible that moving the Sound Labs into a different position would have enhanced their ability to create a solid, three-dimensional image. Similarly, the openness and "correct" balance of midrange and midbass I heard from the US Monitors in my own living room could have been captured in Hart's room with different placement. Many ESLs are sensitive to room positioning.

Conclusions

As a current owner of the older Quad ESL-63, would I pay for a factory-sponsored upgrade to the level of the new US Monitors, if such a deal existed? Definitely! But since this is not possible (sigh!), I will have to struggle with the decision facing many Quad ESL-63 owners—should I buy a new pair of \$3990 US Monitors and sell the ESL-63s? After all, I now have a suitable amplifier that won't break down (either amp or speaker) with ESL-63s. Tighter bass and a more open upper midrange make the new US Monitor a clear winner over older Quad ESL-63s. The US Monitor is much more open (perhaps because of those new metal screens), faster-sounding, with tighter bass, and slightly less blurred highs than on my *ca* 1983 ESL-63s.

The big news here is the Quad's increased ruggedness and reliability; it also displays slight to moderate improvements in sonics. I was impressed that the Quad (to my ears) bettered the "top-seed" A-3 system in solidity of imaging and on some recordings of high soprano voice. The speaker can't be damaged by any signal level that I threw at it (those of you who know the ML-9 will respect its punch!). It now is an acceptable speaker for pop and rock; what it loses in bass sock it more than makes up in naturalness and imaging. It is rugged, sturdy, can be moved around by one person, and is easy to place in a living room, having a good WAF³ (wife acceptance factor). It can even be shipped for repairs or grille-cloth changes by UPS (the Sound Labs A-3 is platenized and shipped directly by a special trucking service). Sonically, the Quad remains one of my all-time favorite loudspeakers in terms of imaging, focus, low distortion, and low listening fatigue.

For those who are first-time buyers, the US Monitor is a godsend. If you must have an electrostatic, you will appreciate the speaker's long and honorable origins, development, and well-developed protection circuit. Its price point is set well below the most expensive Sound Labs, Apogeos, Duntechs, and IRS Betas. They may excel in the deepest bass range, have more dynamics and greater soundstage width, but the US Monitor will hold its own in naturalness of sound, pinpoint three-dimensional imaging, and signal coherency over the frequency range (sounds emanating from a single source).

S

³ Thanks again to Glenn Hart, who did not coin this term—it was Lewis Lipnick—but from whom I heard it for the first time!

YES, MORE LOUDSPEAKERS

John Atkinson listens to three tiny tots and two floorstanding models

Angstrom Reflexion: reflex-loaded, floor-standing, "two-and-a-half"–way loudspeaker. Drive-units: 1" plastic-dome tweeter, two 8" polymer-loaded, polypropylene-cone woofers. Crossover frequencies: 250Hz, 2kHz. Frequency response: 35Hz–20kHz \pm 2dB. Sensitivity: 95dB/W/m. Nominal impedance: 6 ohms. Amplifier requirements: 7W minimum, up to 200W. Dimensions: 38" H (including stands) by 10.5" W by 12.5" D. Enclosure volume: 48 liters. Weight: 44 lbs each. Price: \$995/pair (stands inc.). Approximate number of dealers: 22. Manufacturer: Amtec Marketing, Canada. Distributor: Angstrom Associates (USA) Inc., 210 8th Street, Lewiston, NY 14092. Tel: (800) 387-8193.

Black Bag: two-way, sealed-box, stand-mounted loudspeaker. Drive-units: 1" soft-dome tweeter, 6" doped paper-cone woofer. Crossover frequency: 2500Hz. Frequency response: 50Hz–20kHz \pm 2, –5dB. Sensitivity: 84dB/W/m. Nominal impedance: 4 ohms. Amplifier requirements: more than 50W. Dimensions: 15" H by 9" W by 8" D. Weight: 33 lbs/pair. Price: \$369/pair. Approximate number of dealers: 20. Manufacturer: Avalon Audio Ltd., Canada. Distributor: Audiophile Accessories, 119 East Wayne Street, Butler, PA 16001. Tel: (412) 282-7195.

Rogers LS3/5a: two-way, sealed-box, stand-mounted loudspeaker. Drive-units: 0.75" plastic-dome tweeter, 4.5" Bextrene-cone woofer. Crossover frequency: 3kHz. Frequency response: 80Hz–20kHz \pm 3dB. Sensitivity: 82dB/W/m. Nominal impedance: 16 ohms. Amplifier requirements: 50W maximum. Dimensions: 12" H by 7.5" W by 6.25" D. Enclosure volume: 5 liters. Weight: 11.7 lbs each. Price: \$650/pair. Approximate number of dealers: 60. Manufacturer: Rogers Loudspeakers Ltd., Mitcham, Surrey, England. Distributor: Audio Influx Corporation, PO Box 381, Highland Lakes, NJ 07422-0381. Tel: (201) 764-8958.

Taddeo Loudspeaker Company Domestic Monitor One: two-way, reflex-loaded, floor-standing loudspeaker with patented enclosure design. Drive-units: 1" soft-dome tweeter, 6" polypropylene-cone woofer. Crossover frequency: 2kHz. Frequency response: 42Hz–22kHz \pm 3dB. Sensitivity: 92dB/W/m. Nominal impedance: 8 ohms. Amplifier requirements: up to 100W RMS. Dimensions: 40.5" H by 9" W by 10.75" D. Shipping weight: 40 lbs each. Price: \$849/pair. Approximate number of dealers: 4. Manufacturer: Taddeo Loudspeaker Company, 2604 Elmwood Avenue, Suite 105, Rochester, NY 14618. Tel: (716) 244-6027.

Wharfedale Diamond III: two-way, reflex-loaded (5th-order), stand-mounted loudspeaker. Drive-units: 1" plastic-dome tweeter, 4.5" mineral-filled polypropylene-cone woofer. Crossover frequency: 5kHz. Frequency range: 50Hz–20kHz (wall-mounted). Sensitivity: 86dB/W/m. Nominal impedance: 8 ohms. Amplifier requirements: up to 100W RMS. Dimensions: 9.5" H by 7.25" W by 8" D. Internal volume: 5.2 liters. Shipping weight: 7kg (15.4 lbs) per pair. 10 different grille colors available at extra cost. Price: \$300/pair. Approximate number of dealers: 65. Manufacturer: Wharfedale Ltd., Sandleas Way, Crossgates, Leeds, West Yorkshire LS15 8AL, UK. Distributor: Vector Research Inc., 1230 Calle Suerte, Camarillo, CA 93010. Tel: (805) 987-1312.

I am constantly amazed at the continuing proliferation of loudspeaker companies. It seems as if everyone, their uncle, *and* their brother-in-law has an original idea for a loudspeaker design and has started a company to market it. As noted by Larry Greenhill elsewhere in this issue, the October 1988 issue of *Audio* listed nearly 260 companies offering speakers to the Great American Public, and I am sure that there will be many more to come. I sometimes feel, therefore, that my ongoing project to review at least a representative sample of the under-

\$1000/pair field is doomed to failure. As soon as this Sorcerer's Apprentice of a writer has unpacked, listened, measured, written about, and repacked a pair of speakers, two more pairs will arrive at his door courtesy of *Stereophile's* Shipping & Receiving Department (Danny Sandoval).

Thus it was while preparing last month's review, which featured designs from MB Quart, Rauna, Spectrum, and Wharfedale: By the time the review had been consigned to floppy disk, another seven pairs were stacked in a holding pattern outside the listening room. This month

I describe my adventures with five of the seven, one pair, the Amrita Amrit MiniMonitors, still awaiting replacement of one speaker that arrived DOTB (dead-out-of-the-box), and the seventh, the Monitor Audio R300/MDs, arriving just too late to be accommodated this time around!

Three models, as the review heading suggests, are miniatures: the Black Bag from Canada, the latest version of Wharfedale's best-selling Diamond, and the venerable BBC design, the LS3/5a. The remaining two, the Canadian Reflexion, from Angstrom, and the US-made Taddeo Loudspeaker Company Domestic Monitor One, are floorstanding models. This is always an advantage in a budget speaker, as a pair of good stands significantly adds to the purchase price. (If you don't want *good* stands, then why are you reading *Stereophile*?)

Onward, then (and keep up at the back there Mr. Aczel)!

Review procedure

This followed, with minor changes, that established for my previous loudspeaker reviews: Each pair was used with both a Krell KSA-50 and a pair of VTL 100W Compact monoblocks, connected with Monster M1 speaker cable, while the preamplifier was the Mod Squad Phono Drive/Deluxe Line Drive combination. Source components consisted of a Marantz CD-94 CD player, which was also used to drive the Sony DAS-R1 D/A converter unit reviewed by JGH in December, a 1975 vintage Revox A77 to play my own 15ips master tapes, and a Linn Sondek/Ekos/Troika setup sitting on a Sound Organisation table to play LPs. Interconnect was Audioquest LiveWire Lapis. The three miniature speakers sat either on a pair of 24" wooden Chicago Speaker Stands, with a sheet of Sims Vibration Dynamics Navcom placed between the top-plate of each stand and the loudspeaker, or on a pair of Arcici "Rigid Riser" stands, which have a height adjustable between 20" and 36". The loudspeakers were carefully positioned for optimum performance, and both stands and floorstanding speakers were coupled to the tile floor beneath the rug with spikes. In addition to a rigorous listening test, with no other speakers in the room, each pair of speakers was used

for a period of everyday use.

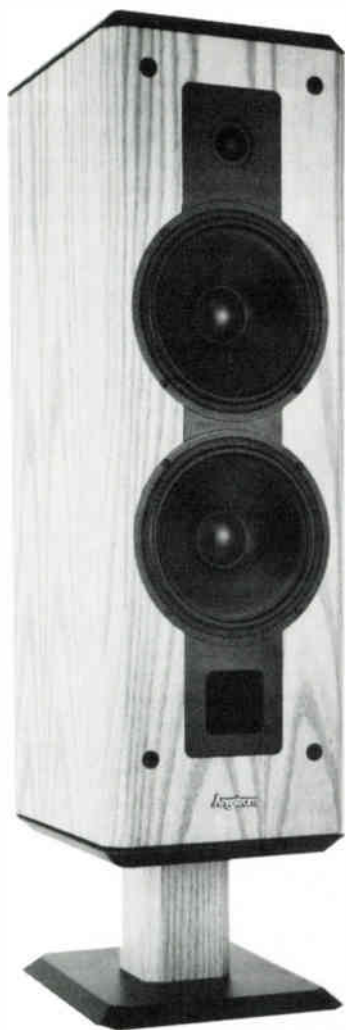
I estimated the voltage sensitivity (using 1/3-octave pink noise centered on 1kHz) and measured the change of impedance with frequency, while the nearfield low-frequency response of each speaker was assessed with a sinewave sweep to get an idea of the true bass extension relative to the level at 100Hz. The frequency response of each speaker in the listening area was measured using pink noise and an Audio Control SA-3050A 1/3-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 intended to minimize the effect of low-frequency room standing-wave problems on the measurement, and gives a response curve that has proved to correlate reasonably well with what is perceived; it also gives an idea of the off-axis behavior of the speaker under test.

Angstrom Reflexion: \$995/pair

The Reflexion is the top model in a range of three almost identically styled speakers from Angstrom and was first reviewed in *Stereophile* very favorably by Bill Sommerwerck almost two years ago (Vol.10 No.3). Soon after the appearance of that review, however, the Canadian manufacturer of the speaker went into receivership, and there was sufficient doubt about the speaker's availability that we withheld a "Recommended Components" mention. The company was then bought out by two of its employees, however, including Martin Stec, the Angstrom designer, and the speaker is back in production, albeit with a number of slight engineering improvements and cosmetic refinements.

The Reflexion's cabinet is made from 19mm chipboard impregnated with a high content of epoxy, and is veneered on all sides in what appears to be real oak, except for the top and bottom plates, which are finished in black. The vertical edges of its baffle and back appear chamfered; these, however, are additional pieces giving an eight-sided enclosure which is said to be considerably more rigid than a rectangular box. In addition, diagonal braces reinforce the side panels, and a horizontal strut connects

1 A complete list of loudspeakers costing under \$2000/pair that have been reviewed in *Stereophile* and were in production on January 1, 1989, appeared on p. 163 of Vol.12 No.1 (January 1989).



Angstrom Reflexion loudspeaker

the baffle to the rear panel between the bass drivers. These are rebated into the baffle and are sourced from the Danish Vifa company, while the tweeter, handling frequencies above 2kHz, is the common Vifa 1" polyamide-dome unit, which has a shallow horn flare surrounding the diaphragm. This flare is, in turn, surrounded by a felt "blanket" on the tweeter front-plate and the baffle to lower the level of deleterious diffractive effects. The felt is also used as a styling feature between the woofers and around the $2\frac{1}{4}$ in² reflex port vertically below them. The port is 6" deep.

As described in the specification heading, the Reflexion is a "two-and-a-half"-way design. Though it has two woofers, the lower one is rolled off above 250Hz so that the radiating area in the region where both drivers would otherwise cross over to the tweeter is minimized, avoiding what would be severe vertical beaming problems in this region. The cross-over appears relatively complex. It is attached to the rear panel and uses Mylar-film capacitors and air-cored inductors, while electrical connection is via angled binding posts. The integral stand consists of an eight-sided chip-board cylinder and a black baseplate, these attached to the base of the speaker with a steel rod. Spikes are supplied and screw into bushes in the underside of the stand. The black grille is profiled to minimize diffraction problems, but as the speaker is obviously intended to look good without the grille, I left it off for the auditioning.

All things considered, the purchaser of the Angstrom Reflexion gets a lot of loudspeaker for the money, extremely well-made and well-finished. How does it sound?

The sound: To briefly summarize Bill Sommerwerck's findings on the Reflexion's sound, he felt that it had a subtly detailed midrange, an open, "tuneful" bass, and highs that were detailed but rather exaggerated.

Hmm. After a considerable amount of listening, I would describe the Reflexion as having a subtly detailed (but recessed) midrange, a rich, rather exaggerated bass, and highs that are detailed, with a touch of hardness in the low treble and a trace of sibilance emphasis in the high treble. (This "whitened" recorded tape hiss enough to be noticeable.) All in all, rather an "old-fashioned," warm tonal balance with a heavy bass, mainly mellow, with enough HF lift to avoid dullness.

But Bill, why didn't you mention the excellence of the soundstaging?

On every recording I played, I was surprised by the sense of space reproduced by the Reflexions. Take, for example, the ASV recording of *Messiah* highlights (CD DCA 525). Reproduced on some of the other speakers in this report, the Taddeo Domestic Monitor One, for example, there is plenty of ambience but everything is strung in a line between the loudspeakers. Over the Reflexions, I was transported into Winchester Cathedral. Similarly on my own

recordings of pianist Anna-Maria Stanczyk performing Chopin, the hall sound is well apparent, with the piano image set back the correct distance in the soundstage rather than being thrust forward, as happens most of the time.

I suspect that this coherent presentation of depth could be due both to a lack of energy in the low treble pushing the image back and the rich bass exaggerating the nature of the low-frequency ambience, giving the ear/brain more clues about the nature of the recorded acoustic. But it was persistent from recording to recording. At 3:55 into the Dvorak String Serenade movement on the *HFN/RR* Test CD, the first violins to the front left of the stage play four repeated eighth notes: vividly audible at the *right rear* of the soundstage are the reflections of those notes from the far side of the recording venue.

The Angstrom Reflexion features Class B performance in this area, but I found myself becoming tired of the voluptuous nature of the bass. Whatever the music, it was all a little overripe for my tastes. In addition, the "rumbly" nature of the bass was not well-suited to LP playback, which generally tended to sound too uncontrolled too much of the time. It also lent male voice a rather "grumbly" quality. (Interestingly, I have had exactly the same experience with other speakers that use two woofers with the lower one rolled off early.) Combined with the Reflexion's propensity for its treble to harden at climaxes, and the sibilant nature of the extreme highs, this meant that I ended the listening sessions a little bit less satisfied than I had originally expected. Overall, then, the Reflexion is a competent-sounding design with flashes of greatness.

Measurement: Fig.1 shows the manner in which the Reflexion's impedance changes with

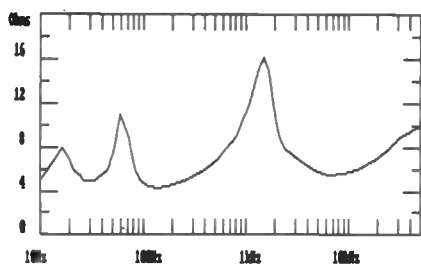


Fig. 1 Impedance

frequency. The use of two woofers gives a low value throughout the bass region, apart from at the twin reflex peaks (these well-damped), with minima of 4–5 ohms at the port tuning frequency of 31Hz and in the upper bass. The Reflexion will therefore demand a little too much current to be happy with inexpensive Japanese receivers. Things are better in the treble, however, with the impedance averaging between 6 and 7 ohms between 2kHz and 20kHz. The voltage sensitivity at 1kHz was 89dB/W/m, 6dB lower than specification. This is presumably due to a frequency-response dip in the 1kHz region.

Measured in the nearfield midway between the lower woofer and the port, the bass extension was reasonably good, with the -6dB point with respect to 100Hz lying at 45Hz. As can be seen from the graph of the spatially averaged in-room response (fig.2), the bass rolls off rapidly below about 40Hz, but more importantly, the entire low-frequency region is lifted by about 5dB when referenced to the midband (thus explaining both the difference in measured midband sensitivity *and* my feelings of an exaggerated bass). The inevitable loss of energy that occurs in my room in the 250–500Hz octave is also more severe than with other designs. The cabinet seemed quite dead from the low midrange upward, but the side-panels and top were very live in the 195–295Hz region.

The low treble is reasonably smooth, but a strong peak appears on-axis centered on the 12.5kHz $\frac{1}{3}$ -octave band. The vertical listening axis appeared quite critical, the response being flattest on or just below the tweeter axis. If you sit so that you can see the cabinet top, a strong suckout appears in the two octaves above the crossover point, though this is an unrealistically high listening position. If you sit on the axis of the upper of the two woofers, the midrange

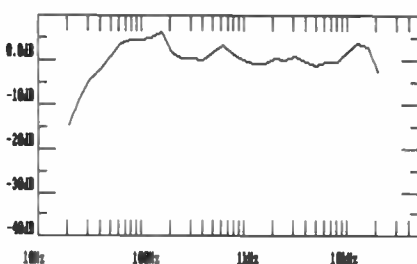


Fig. 2 Spatially averaged, $\frac{1}{3}$ -octave, in-room response

becomes too uneven. Pair matching was only fair, one speaker having about 2dB less treble energy than the other.

Conclusion: On the positive side, the Angstrom Reflexion features a warm, mellow tonal balance, with a superbly detailed midband and specific, stable imaging. Its reproduction of recorded image depth is nothing short of excellent. Its debits include a propensity for hardness in the low treble and an exaggerated, if still controlled, bass which can become too much of a good thing. A high Class D recommendation, overall, would be appropriate.

Black Bag: \$369/pair

It was Bill Sommerwerck's report from the 1986 Toronto show (Vol.9 No.7) that alerted me to the Canadian Black Bag loudspeaker. "So ugly. . . we had to put a bag over its head," Bill quoted the speaker's promotional literature as saying, the manufacturer feeling that "it will make everything else of its owner's look better." It actually is a conventional-looking, two-way mini-speaker, "designed by a well-known [but anonymous] English designer," attractively proportioned, and finished in a black, wood-grain vinyl wrap. A conventional 1" fabric-dome tweeter crosses over below 2500Hz to a 6" doped-paper-cone woofer fitted with a half-roll surround. No information on the crossover characteristics was available (though looking at the acoustic output of each driver in its nearfield suggests second-order, 12dB/octave slopes), and the unique nature of the fixing screws meant that I wasn't able to poke around inside. The tweeter is surrounded with felt to give a degree of diffraction control, and electrical connection is via a pair of recessed binding posts on the cabinet rear.

The sound: Audiophile Accessories' Brian Bolger advised that the Bags sounded best mounted on stands between 16" and 20" high, placed well out in the room; they were initially mounted, therefore, on the Arcici Rigid Riser Stands set to 20". The sound was very lightweight, with about the same subjective extension as the LS3/5a but much drier. So, as there was very little image depth apparent even with the speakers out in the room, it seemed a good idea to move them much nearer the rear wall (which is actually faced with records and books) to get some boundary reinforcement



Black Bag loudspeaker

at low frequencies. This did give a little more body to the sound, but the Bag still seemed to be too overdamped in the bass for such a small enclosure to satisfy on a long-term basis.

The axis giving the best integration between the two drive-units was just below the tweeter. Above that and the mid-treble sounded too isolated, though no listening position gave a totally smooth response in this region. Pink noise, for example, gave a twin-peaked treble sound. I ended up putting the Bags on the 24" stands for the remainder of the listening.

Though the sound now had more body, the lower midrange was not very transparent, there being a slight "quack" coloration apparent. The balance was still thin, with a tilted-up treble region. Clarity was only moderate, the rather peaky low treble throwing some instruments forward in the mix at the expense of others. Violins, too, sounded too astringent. Voice had rather a boxy character, with spit and sibilance somewhat emphasized—what I call "typical soft-dome sizzle," though good soft-dome drivers, like those from Morel and Dynaudio, do not suffer to any great degree in this respect.

Lateral image precision was only fair, while depth was not good even with the Bags out in the room. Of more concern was their limited dynamic range. Playing piano recordings in the 87–89dB SPL range resulting in an unpleasant congestion of the sound in the lower midrange, almost as if the 100W VTL amplifiers were clipping. (They weren't.)

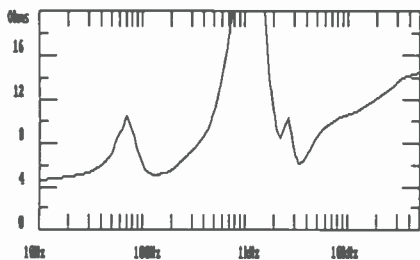


Fig. 3 Impedance

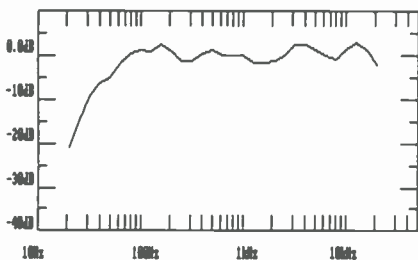


Fig. 4 Spatially averaged, 1/3-octave, in-room response.

Measurement: Fig.3 reveals the fundamental box resonance to lie at 71Hz, but the relatively low impedance above resonance suggests that a reasonably beefy amplifier will be required. In the midrange and above, however, there should be no problems with amplifier compatibility other than that due to the low sensitivity. (I measured this to be 82.5dB/W/m in the 1kHz region—very low, on a par with the LS3/5a.)

Measured in the nearfield of the woofer, the bass response was 6dB down at 61Hz, this extending to around 50Hz in-room, and reasonable for the enclosure size. The midrange appeared relatively flat both in-room (fig.4) and on-axis, though the high treble featured an excess of on-axis energy centered on the 12.5kHz 1/3-octave band. The peak in-room an octave lower is primarily due to the wider dispersion of the tweeter in its first two octaves, where it fundamentally radiates into a hemisphere, though its height does suggest that the tweeter is a little too sensitive to be a good match with the woofer. This would correlate with my feeling of a tilted-up tonal balance. The depression in the 1-2kHz region is a function of the crossover, and deepened both above and below the optimum listening axis, suggesting that the Bags will be quite sensitive to listener height. Pair-matching was quite good, considering the low price, particularly in the range handled by the tweeter.

The cabinet was generally lively in the 100-400Hz region, with very strong panel resonances apparent at 310 and 380Hz.

Conclusion: I was hoping for more from the Black Bags. They don't aim very high, however, and, to be honest, don't achieve much either. In absolute terms, they are not, apart from a more ragged low treble, particularly worse than the Wharfedale Diamond IIs, but as their treble-forward tonal balance and overdamped low end are more likely to exacerbate the problems endemic to inexpensive electronics—typically a thin, dry bass, a bright low treble, and a forward midrange—a recommendation is precluded.

Rogers LS3/5a: \$650/pair

It is unusual for a loudspeaker to remain in production for more than three years. It is rare for one to still be sold five years after its introduction. It is virtually unknown for a speaker to be still available, virtually unchanged, 14 years after that date. Such is the case, however, with the LS3/5a design, which is still popular well into its teenage. (Only a number of horn speakers from Tannoy and Klipsch have been around as long.)

Its genesis was a little unusual, however, and goes some of the way toward explaining its longevity. Back in the early '70s, the BBC needed a physically unobtrusive, nearfield monitor loudspeaker for use in outside-broadcast trucks. Accordingly, they instructed their design department, which at that time featured such luminaries as Dudley Harwood (the "father" of polypropylene) and the late Spencer Hughes (who went on to produce the classic Spondor designs) to produce such a model. The result, the LS3/5a, was then licensed to commercial speaker companies for production. Thus not only was what was then probably the finest collection of British speaker design talent involved in its development, there were no commercial constraints placed on the design. The only limitations were intended to be those arising from the necessarily small enclosure and the absence of the need for a wide dynamic range under close monitoring conditions.

Is it so surprising, then, that the design has proved to be a stayer, outliving many would-be rivals?

Rogers was the first licensee, I understand, and still keeps the LS3/5a in production, but



Rogers LS3/5A loudspeaker

a number of other manufacturers have been licensed at one time or another to produce the speaker, including the now defunct Audiomaster, Chartwell, and RAM (UK) companies. In addition to Rogers, Spendor, Harbeth, and Goodmans all currently produce versions which, while differing in such details as connectors and wood finishes, are intended to sound identical both to each other and to the original standard.

The reason for this classic's inclusion in this review—you might think it's a bit like *Consumer Reports* comparing a '73 Toronado with an '89 Taurus²—was twofold. First, I listened last summer to a system owned by friends, Jan and Ric Mancuso, in which Vandersteen 2Cs had been successfully replaced by a pair of '3/5as. Second, a recent report by Martin Colloms³ indicated that the BBC had consented to a revision of the design, not so much to "improve" it but to ensure that current production was still on target. One of the continuing problems, apparently, was that the KEF woofer specified by the BBC actually lay to one side of the bell curve of production parameters,

resulting in a large drive-unit rejection rate. KEF was persuaded to undertake a program aimed at improving drive-unit and crossover consistency, even to see if the speaker's performance could be improved, although an overriding dictate from the BBC was that any changes were not to alter frequency or tonal balances. A preliminary result of this program was that KEF now supplies matched kits of drivers and crossovers to the companies manufacturing the LS3/5a, even to Rogers, I am informed, who for a while stuck with assembling their own crossovers.

As it happens, I have been using a pair of 1977-vintage LS3/5as for some years, mainly as location monitors, but I also get them out every now and again to use as part of a particular system. I used these bewhiskered samples for the review auditioning, though I had requested a pair representative of Rogers' 1988 production from the importers, Audio Influx, these got lost in shipping and comparisons were not possible before the review deadline. A follow-up is planned.

The cabinet is one of the keys to the LS3/5a. Constructed from real wood—birch—veneered with wood (apart from the front and rear), braced with solid beech strips, and heavily damped, this alone costs the manufacturer the same as the retail price of a typical mass-market speaker. (This is from experience: when Martin Colloms designed a small DIY speaker for *HFN/RR* in 1985, he persuaded me that we should specify that home constructors use the LS3/5a cabinet to ensure consistency of performance. When I found out what the cabinets were going to cost our readers, I almost fainted.) The recessed nature of the front baffle reveals the age of the design—once upon a time, *all* box speakers looked like this—and the woofer/midrange unit is mounted from the *rear* of the cutout. This is a KEF B110, the classic 4.5", doped-Bextrene-cone unit.

Whereas the original driver had a Neoprene surround, the latest version uses a different synthetic material said to give a better termination to traveling waves in the cone, the result being better clarity in the midrange.⁴ The tweeter is the 19mm, Mylar-dome T27 from KEF, fitted with a perforated cover. Possessing an extended HF response, this driver has also been used as

² No contest, right?
³ *HFN/RR*, August 1988.

⁴ For a full discussion of the design's evolution and the improvements featured by the latest version, see the excellent article by Trevor Butler in the January 1989 issue of *HFN/RR*.

a supertweeter in some designs. Owing to the recessed baffle, the designers found it essential to add some form of diffraction control in the tweeter's acoustic environment, this consisting of thick felt strips to minimize the effect of reflections from the edges of the side, top, and bottom panels. The grille is acoustically transparent and is intended to be left on. (It can also be disturbing to see the quite large excursions the B110 cone makes on bass transients.) The crossover, carried on a large pcb attached to the rear wall, is the heart of the LS3/5a, and is complex, consisting of 13 elements. It can be individually tuned to compensate for variations in drive-unit behavior.

The sound: Used on Chicago 24" stands well out in the room, the characteristic LS3/5a sound was immediately identifiable. Low bass was missing in action, while the upper bass was underdamped, leading to a lack of clarity and a slight degree of congestion in the lower mid-band. (It was the English writer Chris Rogers, I believe, who once referred to the '3/5a's as having a "boomy midrange" compared with a typical reflex design's boomy bass.) Cello became too gruff, and male speaking voice a little chesty. Above that region, however, the speaker was commendably free from coloration, if a little recessed. The treble seemed to gently tilt up, adding a wispy character to the sound, as well as a slight "spitch" to sibilants, though it was relatively free from sizzle. At levels above 90dB, the sound could be heard to harden, violins then taking too much of an astrigent edge.

But what a relief, after most of the speakers reviewed in the last issue and this one, to hear instruments and voices presented with the correct spatial and sonic relationship to one another. So many designs will present violins as being louder or more forward in the soundstage than the violas, or vice versa. Via the LS3/5a, the inner voices of the orchestra were presented in the correct musical relationship with the lead (though the bass line was, of course, weakened.) Of all the speakers in this review group, the '3/5a was the only one to fully convey the tonal differences between different pianos.

The soundstage presented by the Rogers was wide and deep, but, more important, absolutely stable with frequency (apart from a slight propensity for soprano voice to project for-

ward in the mix). The image of a centrally placed voice, which on perfect speakers will have no width whatsoever, was about as narrow as I have ever experienced. With the Bruckner Symphony 4 extract on the *HFN/RR* Test CD, there is a tendency for the image to pull to the sides with some speakers; the LS3/5as had adequate centerfill without a commensurate narrowing of the stage. A recent purchase of mine is the Hyperion recording of Cathedral music for an all-male SATB choir and organ composed by Victorian composer Sir Hubert Parry (CDA66273). (What a joy of the global marketplace that it is possible to find recordings of such obscure but so quintessentially English music,⁵ even in the depths of New Mexico!) Recorded by Tony Faulkner, an almost perfect balance has been struck between the body of the choir, the soloists, and, when appropriate, the organ, all set within a convincing cathedral acoustic. Of course, to reproduce the power of a pipe organ is beyond the capabilities of the LS3/5a, but the delicacy of imaging and the natural tonality of the voices when reproduced via this miniature, coupled with the correct balance struck between the direct sound and the reverberation, draws the listener into both the recorded acoustic *and* the music.

The main faults concerned dynamics and clarity. There was a consistent diluting of the dynamic contrasts inherent within music, leading to what was, on occasion, rather an uninvolved sound. And the retrieval of treble detail was only average compared with the standards set these days by such similarly balanced box speakers as the Acoustic Energy AE1 and Monitor Audio R952/MD. On the Gluck track on the *HFN/RR* Test CD, for example, the most transparent speakers allow the listener to discern that it was raining during the taping, with the soft sound of raindrops hitting the roof apparent beneath the sound of the flute and piano. Via the decade-old LS3/5a pair, the sound of the rain merged into the background microphone hiss. Cymbals, too, lost some of their unique metallic character, acquiring too much of a white-noise tonal quality.

Measurement: All measurements were performed on my own 11-year-old pair of Rogers LS3/5as, the new samples not arriving in time.

⁵ Listen to the Parry setting of William Blake's "Jerusalem" to gain a deeper understanding of what it means to be English.

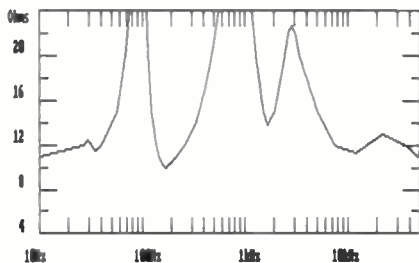


Fig. 5 Impedance

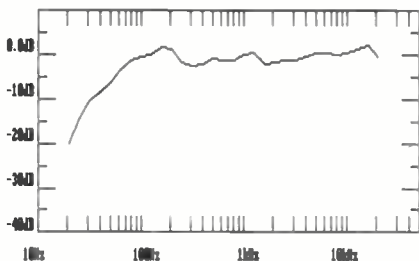


Fig. 6 Spatially averaged, 1/3-octave, in-room response

The high nature of the original LS3/5a's impedance can be seen from the appropriate graph (fig. 5), which has its baseline lifted by 4 ohms in order to show more of the detail that would otherwise disappear off the top of the scale. Dropping below 12 ohms only in the upper bass and the high treble, the LS3/5a's demands for current are few, while the complex nature of the crossover can be seen in the many-peaked nature of the treble. The new version is said to feature a characteristic 11-ohm impedance, which will make it slightly easier to drive. The sealed box is tuned to a high 93Hz. The measured voltage sensitivity was very low, at a fraction over 82dB/W/m. Low-powered amplifiers will not drive the speaker to very high levels, yet the limited dynamic headroom means that high-powered amplifiers are to be avoided—a paradoxical design indeed.⁶

In-room, the spatially averaged response (fig. 6) holds few surprises: a lumpy upper bass, with no low bass to speak of; a basically smooth curve, tilted up in the top two octaves; the exact "subjective" curve, in fact, drawn back in 1976 by J. Gordon Holt on p. 6 of *Stereophile* Vol. 3

⁶ Remember, however, that the 16-ohm impedance of the LS3/5a will mean that amplifiers used with it will have to be downrated. An amp nominally rated at 100W into 8 ohms will only deliver 50W into the LS3/5a before voltage clipping sets in, though it will depend on frequency whether this will occur before the '3/5a's woofer bangs against the end stops.

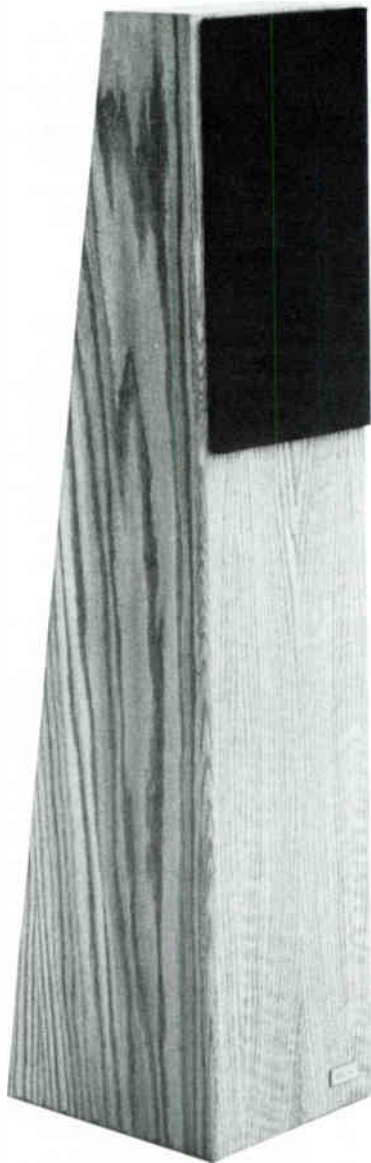
No. 12. Measured in the woofer's nearfield, the -6dB point was a high 68Hz, the room reinforcing this only slightly to just above 50Hz. The degree of upper-bass boom means that the '3/5a must not be placed near the rear wall in an attempt to add bass weight. The result will be thick and muddy.

The slight peak in the 1000–1250Hz region seems to be a consistent feature of the design, but according to Martin Colloms can vary in its height. Modern production is said to be well-behaved in this respect. As is to be expected from a "monitor" design, the pair matching was superb from 200Hz upwards, even when measured at a 2m distance in the listening room. Regarding the rigidity of the enclosure, the LS3/5a was like a rock compared with the other speakers in this report, there only being noticeable sidewall vibration in the 260–360Hz region, and this minor.

Conclusion: There has been considerable evolution in miniature loudspeaker design since 1976, the year I first heard the LS3/5a, particularly concerning transparency, HF smoothness and clarity, and overall dynamics. Such models as the Celestion SL600 and '700, and the Acoustic Energy AE1, compete head-on with the LS3/5a in these areas and come out clear winners. But at less than half the price of even the least expensive of these, the old 'un is still a contender. Used with high-quality tube amplifiers, it will excel in the reproduction of program having a limited dynamic-range requirement; chamber music, for example. At less than half the price of the similarly bass-shy AE1, it still has one of the least colored midbands around, throws a deep, wide, beautifully defined stereo soundstage, and actually offers a lot of performance for what is now a relatively affordable price. The Spica TC-50 is its natural competition in this approximate price region, but the two are different enough tonally that they will appeal to different tastes and work best in different systems. In its latest incarnation, the LS3/5a is provisionally recommended in *Stereophile's* Class C, with confirmation awaiting my auditioning of the new samples.

TLC Domestic Monitor One: \$849/pair

A frozen voice-coil in one the woofers prevented a review of this model in the January



**Taddeo Domestic Monitor One
loudspeaker**

issue. The Taddeo Loudspeaker Company quickly sent along a replacement, however, so all augured well for this month's appearance.

The Domestic Monitor One is a slim floor-standing tower speaker, with an asymmetrically profiled cabinet. Conventionally, the front baffle of a speaker is often sloped to bring the

acoustic centers of the drive-units into alignment. The Monitor One, however, has its rear panel sloped, while the drive-units are aligned to render their outputs approximately time-coincident at the listening position; *ie*, arranging for equal path lengths from each by placing the tweeter *under* the woofer. (This is an idea I first saw used over 10 years ago in the KEF Calinda.) The crossover, too, uses first-order slopes which, if used with the drivers in phase with their acoustic centers closely spaced, will preserve the time coincidence, the result being intended by designer Tony Taddeo to be "a very well damped, fast, clean loudspeaker that reproduces human voice."

The enclosure itself is the subject of a US patent, #4,410,064, and is said to be an integral part of the tuned bass circuit. According to Mr. Taddeo, the enclosure is designed to load the woofer with a quarter-wave transformer at its upper impedance peak. In the classic "acoustic labyrinth" topology dating from the early '30s, the back of the woofer cone is loaded with a pipe equal in length to one quarter of the wavelength at the drive-unit's free-air resonance. This damps the driver's output peak at resonance and reinforces output about one octave higher than that resonance. When well-stuffed with, ideally, longhair wool, in which the speed of sound is significantly lower than in air, this idea is transformed into the "transmission line" concept of the 1960s. As applied by Mr. Taddeo, however, the labyrinth in the Domestic Monitor One (which must be around 36" long; *ie*, the height of the cabinet, given that the upper peak in the woofer's measured impedance lies at 77Hz and that there is internal damping), is fundamentally intended to minimize audible phase problems at this frequency, problems he regards as "the Achilles Heel of vented loudspeaker designs." I understand this to be the patentable nature of the system, and the basis of what Mr. Taddeo regards as "a whole new series of [low-frequency] alignments." A second patent has been applied for on the Domestic Monitor One, but I received no information on this.

Looking at the less arcane aspects of the Domestic Monitor One, the woofer is a 6.5" SEAS unit, with a cast-magnesium frame, an inverted half-roll surround, and ferrofluid in its voice-coil gap. In addition, the woofer has a second magnet glued to the rear of the first, but with poles reversed. This latter modification is said

to increase flux density in the gap, and lower both the driver's Q and its distortion. This driver crosses over above 2kHz or so to a 1" soft-dome tweeter from Morel, this again said to be a low-distortion design and similar to the popular Dynaudio D28 model.

As indicated earlier, the crossover features first-order, 6dB/octave slopes, and high-quality components are used throughout, polypropylene capacitors bypassed with 0.1uF caps, for example, as well as a single ferrite-cored inductor. These are all attached in a somewhat untidy manner to the rear of the terminal panel with a vibration-absorbing glue/goop. The internal wiring is performed with multistrand Apature cable and, somewhat peculiarly, the tweeter appears to be wired out of phase with the woofer, judging by the polarity of the cable connections at the crossover. With ostensibly first-order crossover filters, this will *not* produce a phase-correct design, though Vance Dickason points out in *The Loudspeaker Design Handbook*⁷ that this does enable the designer to steer the vertical response lobe in the crossover region up above the main axis, if the tweeter is vertically above the woofer, or down, if the reverse is true, as is the case here.

Further investigation, however, revealed that with one of the pair of Taddeos, the internal cable was connected to the woofer with inverted polarity, which means that the drivers *are* in phase after all. This was not the case with the speaker that I had to repair, the cable being connected to the woofer with apparently correct polarity, meaning that the drivers were out of phase. (It may be that I made a mistake when replacing the drive-unit, but I took care to label the conductors before detaching them.) I therefore rewired this one of the pair to match the other one and did all the listening and measuring with the speakers wired in this manner. (To have done otherwise would have resulted in a very low optimum listening position, as well as a non-phase-correct character and a large suckout on the woofer axis in the crossover region.)

The cabinet is finished in real-wood veneer on the sides and front, and the edges between the sides and front baffle are contoured. Its asymmetric shape should render it relatively stiff, but it is also braced by vertical wooden

strips running up the four corners to the top, as well as horizontal strips along the side panels just above the terminal panel. A bag of what appears to be some kind of artificial fiber hangs inside the box, to provide a degree of airspace damping and render the internal labyrinth acoustically "longer," while the two ports exit at the base of the cabinet rear, each of these 2" in diameter and 2.75" deep. I don't normally comment on packaging, but in this case I must make an exception: that which TLC provides for shipping the Domestic Monitor Ones is inadequate, in my opinion. One of the speakers arrived with one corner crushed (this only affected the cosmetics, not the sound), while insufficient protection was provided for the tweeter domes, one of which was squashed flat. Luckily, it proved possible to restore its shape, without any ultimate effect on the sound quality.

The sound: TLC advises that the speakers be used with the spikes attached for stability and to "provide a pathway for dissipation of unwanted stored energy from the enclosure panels." I found them to be essential on my carpeted floor so that the speakers didn't fall over forward. (Having the two drivers at the top front of a tapered cabinet places a considerable proportion of the total mass in front of the center of gravity.) However, my listening seat places my ear 37" from the ground, and listening to pink noise revealed that I was sitting too low to get the smoothest integration between the drive-units. Accordingly, I removed the front spikes to tilt the optimum axis downward, though this now made the Domestic Monitor Ones alarmingly unstable. I had to live with that, however, and animals and small children were warned away from my room accordingly. Although the grilles consist of cloth stretched across unprofiled fiberboard, TLC advises that the best sound is obtained with the grilles left in place and the speakers placed between 4" and 6" from the rear wall. This is how the Domestic Monitor Ones were auditioned, therefore, toed-in toward the listening seat. Moving the speakers out in the room very quickly rendered the sound too thin in the bass.

As I indicated, pink noise revealed the sound to change quite drastically with small vertical changes of listening position, this a function of the first-order crossover slopes. Listening just above the woofer axis results in the most

⁷ Available from Old Colony Books, PO Box 243, Peterborough, NH 03458-0243. Tel: (603) 924-6371/6526. Price: \$19.95 plus \$1.75 postage and handling.

even balance; on the woofer axis or below, it gives a balance with the tweeter too high in level and "detached" from the body of the sound.

Once I had established the best listening conditions, I was quite impressed with the sound of the Domestic Monitor Ones. Low frequencies were reasonably extended, if a little lacking in weight, but had a considerably greater degree of control than I am used to from vented designs. The kick drum on the *HFN/RR* drum track, for example, had excellent definition, while male voice was presented with a natural proportion between the chest and throat tones. Even double-basses in general both had just enough level to provide a solid foundation for the music and were cleanly enough outlined that the music didn't sound "slow." Moving up in frequency, the lower midrange was less well-defined, there being some veiling of detail in this region, which might tie in with the fact that the cabinet suffered from severe vibrational problems in the 295-315Hz region. This was most noticeable on electric bass recordings, but also on close-miked piano, and affected lower-midrange dynamics, female voice sometimes sounding a little reticent. But overall, midrange coloration levels were low.

The upper midrange and the treble, however, were where the Taddeo speaker scored its highest marks. Apart from a degree of nonsense in the 1kHz region, audible as a "rattle" on applause, a hardness (almost a shriek) on massed violins, and an undue emphasis on piano notes at the top of the treble staff, high frequencies were smooth, detailed, and clean. This Morel is obviously an excellent tweeter. Instrumental detail in complex orchestral passages was clearly delineated without being thrust forward, while percussion instruments reproduced with clean leading edges.

It was in the area of soundstaging that the Taddeo suffered in comparison with the Angstrom Reflexion and with such thoroughbreds as the Celestion SL700 and Rogers LS3/5a. Lateral precision was quite good, although orchestral passages were somewhat lacking in centerfill. And when a recording had the capability for producing images beyond the speaker positions, such as the applause on the Audiofon live recording of Earl Wild at Carnegie Hall (Audiofon CD72008-2), the stage was wide and stable, considering the spaced-omni miking on this recording. But the soundstage was flat and

severely lacking in depth. In part, this must have been due to the close-wall placement dictated by the bass tuning, but it was certainly a constant feature of my auditioning. Ambience and reverberation on recordings could definitely be heard, but they just didn't gel with the direct sound of the instrument producing it. On the Celestion SL700s, for example, the Gluck track on the *IIFN/RR* Test CD has the flute clearly in front of the piano. On the Taddeos, the instruments were in the same plane, even though the tiny details of the recording—the rain on the concert-hall roof, for example—were clearly audible.

Measurement: As I had to repair one of the pair, I checked the voltage drive to each of the two drive-units supplied by the crossover out of morbid curiosity, using pink noise and the Audio Control $\frac{1}{3}$ -octave analyzer. As can be seen from fig. 7, which displays both high- and low-pass functions when loaded by the drive-unit impedances, the actual crossover point is a little lower than specification, both filters being 3dB down in the 1100Hz region rather than at 2kHz. The slopes, however, can be seen to be first-order, at 6dB/octave, and the curves show how demanding this topology is on both drive-units to be well-behaved out of their passbands. I suspect that the midrange hardness noted in the auditioning was due to the tweeter being crossed over at too low a frequency. Certainly the 1100Hz crossover is on the wrong side of its own resonance, which can be seen from the plot of impedance against frequency (fig. 8) to appear to lie at 1750Hz. Though this appears to be well-damped, it is still not a good idea to have it so close to the tweeter passband, the tweeter drive being only 2dB or so down at this frequency.

The main box resonance can be seen at 77Hz, with the ports tuned to 55Hz. The tweeter res-

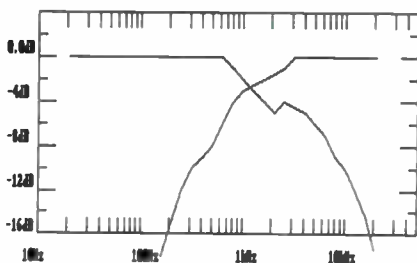


Fig. 7 Voltage at drive-unit terminals

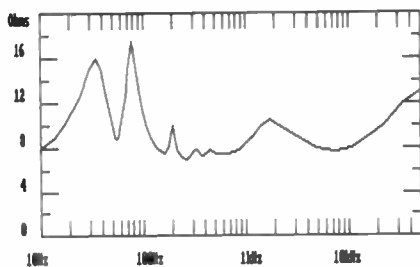


Fig. 8 Impedance

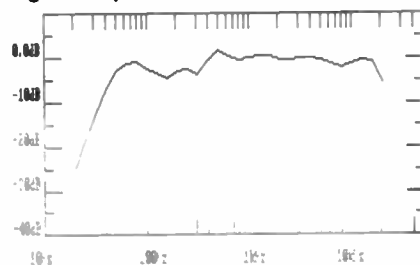


Fig. 9 Spatially averaged, 1/3-octave, in-room response

onance seems well-damped, though the wrinkles in impedance seen in the lower midrange are, I imagine, due to the labyrinth introducing resonances when its length becomes equivalent to an odd number of quarter-wavelengths of the driving signal. Rarely descending below 8 ohms, the overall curve suggests that, in conjunction with the Domestic Monitor One's highish sensitivity—I measured 89dB/W/m, which is 3dB lower than specification—it will be well-suited to inexpensive, low-powered amplifiers or receivers.

Measured in the woofer's nearfield, the low-frequency -6dB lay at a high 63Hz, though the port output was also centered on this frequency, which should extend the intrinsic bass response to around 48Hz. Measured in-room, the spatially averaged response (fig.9) indicates useful bass extension down to around 40Hz, though it should be noted that the entire bass region is actually shelved down by 2-3dB when compared with the low treble, which will make the speaker sound a little "thinner" than expected. The lack of energy in the lower midrange in-room was more severe than usual, with a peak at 500Hz also noticeable on all axes, this strongest at the lowest microphone height, just below the tweeter axis. The flattest response through this region was obtained with the measuring microphone on an axis 5" higher than the cabinet top. This is, in my view, an unnaturally high

listening position, but the response on this axis is then ± 0.5 dB from 400Hz to nearly 8kHz. The speakers differed slightly in their top octave of response, one having between 2dB and 3dB more output in this region, suggesting inadequate quality control.

Conclusion: I am tempted to say that, with the difficulties I experienced in getting a working pair of TLC Domestic Monitor Ones, coupled with the differences in high-frequency balance between the pair, the Taddeo Loudspeaker Company needs to work on its quality control. The fact remains, however, that once they were working properly, the Domestic Monitor Ones proved capable of delivering quite a refined sound, with reasonable bass extension and definition, a reasonably uncolored and detailed midrange, and a smooth high end. Whether or not the poor soundstaging and the overall thin-sounding balance will be problems will depend on the individual. Tentatively recommended, therefore, particularly as its close wall-placement will be a major advantage in small rooms.

Wharfedale Diamond III: \$300/pair

The original Diamond was a phenomenon; tiny enough to be regarded as a kind of British joke, it proved to have a big enough sound that it sold very well to hard-boiled American audiophiles. Even J. Gordon Holt, *Stereophile's* resident sage and a man who is drawn irresistibly to big speakers, was impressed enough in Vol.8 No.3 to categorize the Diamond as being the least expensive speaker worth recommending, "not because they are serious competition for an IRS... but because they do so well through the fairly modest range they are designed to encompass."

The Diamond III differs from its predecessors in having a Wharfedale-designed and -manufactured plastic-dome tweeter rather than an Audax unit, but otherwise appears identical. The midrange and what there are of bass frequencies are handled by another Wharfedale driver, this a diminutive 4.5" unit with a mineral-filled polypropylene cone. The low-frequency alignment is basically fifth-order, a series electrolytic capacitor in the woofer feed increasing the rate of rolloff below the reflex-port passband. The crossover operates at a nominal frequency of 5kHz and consists of



Wharfedale Diamond III loudspeaker

four components carried on a small pcb fastened to the rear of the five-way binding posts. The woofer appears to be allowed to roll off mechanically in the treble, while the tweeter is fed by a second-order high-pass network with a level-matching resistor. The vinyl-covered cabinet—from the look of the grain, it appears to come from the same plastic tree used to cover the Black Bags—is constructed from ½" chipboard, with the 2½"-deep, 1¼"-diameter reflex port on the rear, above the terminals. A modest amount of BAF (Bonded Acrylic Fiber) wadding is used to fill the space behind the woofer, but there is no other internal acoustic treatment.

The grille consists of cloth stretched over a molded-plastic frame, and therein lies a tale. As reported by Ken Kessler exactly a year ago (Vol. II No.2), Wharfedale sponsored psycho-acoustic research into how color affects the perception of sound. It is well known, for example, that a blue environment is conducive to a feeling of being at peace. The Wharfedale work indicated that, wait for it, *grille color* affected the perception of sound. A speaker fitted with a red grille, for example, will be perceived as having more bass than one finished in yellow, which in turn sounds as if it is brighter than one with a pastel grille. There is a range of ten colored grilles available at slightly greater cost for the Wharfedale Diamond III, therefore. Needless to say, I asked for the review pair to be fitted with a black grille cloth!

The sound: The bass tuning is intended to be optimum with the cabinet rear, and hence the port, less than 6" away from the rear wall. This was how the Diamonds were set up, therefore,

sitting on 24" Chicago Speaker Stands and toed-in to the listening chair. Expecting little, I was pleasantly surprised. At reasonable listening levels (up to around 88dB), the sound, though undoubtedly being produced by a small box, was "big" enough to satisfy on musical grounds. Nothing apart from low bass was obviously missing.

This is not say that we are talking Class A performance here. The soundstaging was poor. There was very little apparent depth, and lateral imaging, though reasonably precise at high frequencies, was less so in the midrange. Centrally placed images with a strong midband content—Emma Kirkby on the Hyperion *Hildegard of Bingen* recording, for example—"splashed" to the sides at some frequencies. The whole lower midband also seemed quite uneven, though the region at the top of the woofer's range, where other inexpensive two-way designs have problems crossing over to the tweeter, was relatively clean. The high treble seemed depressed in level compared with the midband, the balance sounding mellow and lacking "air" (though there was a degree of sizzle on cymbals). Treble detail was good, however, percussion instruments being particularly well-defined.

Low bass there was none, of course, and the upper bass was definitely soft, pizzicato double-basses having very little definition. Cello, however, reproduced well, despite a degree of confusion in its upper register, the sound "blurring" during complex passages with more than one instrument playing. Piano, too, came over with a degree of believability, despite having a thin, rather nasal left-hand register and a generally uneven lower midrange. The Diamond III presented the music's dynamics reasonably well, being better than both the more refined LS3/5a and the similarly priced Black Bag in this respect. It made a reasonable attempt at reproducing the drums on the *HFN/RR* Test CD with a degree of verve, and even survived the infamous garage door track at SPLs approaching the mid 90s.

As expected from such an inexpensive design, levels of coloration were rather high, the midband possessing an "aww" character that lent a "hooded" quality to voice and a "hooty" quality to flute. Male voices, too, had a rather boomy nature, while the upper midrange, while not quite becoming "bright," was nevertheless a little relentless. It is easy to be critical,

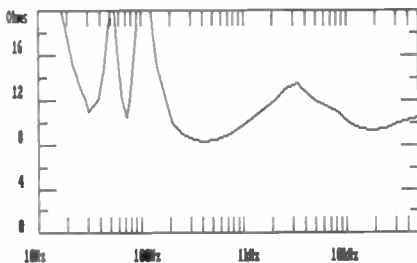


Fig. 10 Impedance

however, and I repeat that the sound from these midgets was surprisingly musical much of the time.

Measurement: The graph of the change in impedance with frequency (fig.10) clearly shows the effect of the series capacitor in the woofer feed, the impedance rising rapidly below 30Hz. Both port and box resonances are relatively high in frequency, at 73Hz and 106Hz respectively, as is to be expected from such a reasonably sensitive, small enclosure. (The measured sensitivity at 1kHz was 85dB/W/m.) The impedance hardly drops below 8 ohms, however, and the Diamond III should mate well with the inexpensive amplifiers with which it is expected to be used.

No one would expect to get any low bass from this speaker, an opinion confirmed by the nearfield measurement, which indicates a -6dB point at 76Hz for the woofer, this extending in-room (fig.11) to about 55Hz. The spatially averaged in-room response was taken with the speakers about 20" out from the rear wall, which can be seen to give a bass-shy sound. The response was also audibly forward in the midband, with between 3dB and 5dB extra level in the two octaves from 500Hz to 1500Hz, even when measured off-axis. The upper of the tweeter's two octaves was also a little exaggerated in level. This could not be ameliorated by listening to the speakers off-axis due to the

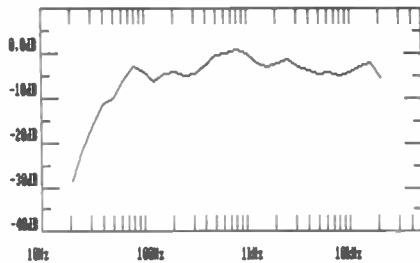


Fig. 11 Spatially averaged, 1/3-octave, in-room response

wide HF dispersion; the vertical listening axis also seemed relatively non-critical.

The cabinet was reasonably inert in the mid-band and above, but seemed very live in the region between 230Hz and 320Hz, one speaker of the pair even buzzing slightly (with a very high Q) at 290Hz and 310Hz. This liveliness may correlate with the degree of sonic confusion noted on voices and instruments with strong levels of energy in this region.

Conclusion: Wharfedale's Diamond III is overall a better loudspeaker than I remember the I or II as being, particularly in the more refined nature of its treble. The lack of low bass aside, it was easy to forget the Diamond's size and enjoy the music—at moderate listening levels. It would be interesting to compare the III with the equally diminutive Goodmans Maxim 2 (reviewed by Tom Norton back in July '88), which was designed by the designer of the original Diamond. In the meantime, the Diamond III just scrapes a Class D recommendation on the grounds that, in small rooms at least, its tonal character and ease of drive will get the best from inexpensive amplification, and its basic quality is such that it will benefit from upgrades in electronics and source components. And again, its close-wall placement will be a practical advantage in many situations where positioning speakers out in the room is not feasible. **S**

FOLLOW UP

VPI HW-19/II turntable VPI Quartz Microprocessor Power Line Conditioner

Late in 1987, Harry Weisfeld of VPI sent a new motor for the HW-19/II, along with a terse note: if I didn't promptly review the motor (and

favorably), thugs would remove my '19 and replace it with a \$60 (list) Pioneer. Fortunately, my prompt removal to Washington confused VPI, and my '19 *cum* WTA remains intact, despite the outrageously long time I have taken to review these products.

Seriously, though, I and several other reviewers have suggested that there is no such thing as inaudible flutter. Although there appears to be a level below which flutter is not perceived as flutter, it appears that any amount of flutter creates some smearing, grudge, blurring, or noise. (The apparently greater detail of digital recording is due, in part, to its zero flutter.)

This new motor for the VPI, standard on the III series, is supposed to reduce measurable flutter to 0.03% or less, a very low figure for any turntable. At this point, flutter should no longer be audible *per se*, so are there any further benefits to be gained?

Also to be evaluated were sonic benefits from the VPI Power Line Conditioner, a variable-frequency power supply for any synchronous or induction motor device. After a demo at the 1986 SCES that showed a slight but noticeable reduction in grudge and increase in focus, I bought a PLC. In my own system, though, there was no improvement; if anything, there was a very slight deterioration. I put the PLC aside until 1987, when Harry Weisfeld told me the output transformers of many units had been damaged in shipping, and there had been some problems with a defective microprocessor. The PLC was dutifully returned for repair.

Installing the PLC is easy: you plug *it* into the wall outlet, the turntable into the PLC, and set the switches on the front panel to 60Hz. Replacing the motor is more work, though not at all difficult; no instructions are supplied, and none are needed. I won't insult anyone's intelligence explaining how to do it.

However, I should warn you that you'll need a soldering iron to reconnect the power leads to the switch. (Unless you intend to depend on the PLC's switch. In which case, you can tie the motor leads with a wire nut.) If you have the Well-Tempered Arm (and you probably do; the '19 and WTA are a deservedly popular combination), you'll have to find a stable location for the armboard when you remove the plinth. (The WTA's jack bracket tapes to the turntable base. It's a pain to remove, and since the WTA's damping cup is full of silicone, you can't tip the arm on its side, either.)

I did all this without breaking or spilling anything, but my VPI sits on an Arcici Lead Balloon—a well-recommended accessory—so it was easy to get underneath. *Think* before you tear into things, and leave yourself plenty of working space.

It takes only a few seconds to move the turntable's power cord from the output of the PLC to the wall outlet. On the other hand, there is no easy way to swap motors. Even if you did, it would take so much time that you'd tend to lose track of any sonic differences. In effect, I really had only a single shot at getting it right.

The solution was to make recordings. (I used a Nakamichi DMP-100 PCM processor feeding a Sony SL-HF900 VCR.) There are four possible combinations of old/new motors, and using/not using the PLC, so I made four recordings.

The differences one hears when changing the drive system or switching to a filtered power supply tend (in my experience) to be subtle, so I chose a high-quality direct-cut LP as source: Sheffield Lab LAB-18, *Romantic Music for Violin and Piano*. This is a clean recording of two instruments that are notably hard to reproduce well, and whose sounds are highly sensitive to subtle errors in reproduction.

I dubbed the first two minutes of the first side, using every combination of motor and power supply. I then listened to all four recordings, in varying combinations, more times than I care to admit. (Both the Stax Lambda Signature headphones, fed by the SRM-T1 driver amp, and B&W 801 Matrix speakers, driven with the Hafler XL-280 amp, were used.)

The new motor did not seem to make any difference, whether used with the PLC or not. This is not to say *you* won't hear a difference; I just didn't hear one in my system. The price is right—\$80 is not much for a motor and a mounting bracket, these days—and the new motor seems to have about twice the torque of the old. (I apply LAST with the motor running; with the new drive system, the HW-19 doesn't slow down anywhere near as much.)

The PLC, however, made quite a difference. The image took on added depth and spaciousness. This was particularly apparent with the violin, which developed a real sense of air and dimensionality.

Also noticeable was an improvement in musical detail and instrumental color. Without the PLC the piano had a dry, flat-sounding mid-range; with the PLC it was notably more liquid and articulate. The violin, too, showed gains in focus and detail. And it's especially nice to be able to switch to 45rpm without having to move the belt; just raise the frequency (variable from 50.0–99.9Hz in 0.1Hz steps) to 81Hz.

Why the PLC (and similar products) work the

way they do is not fully understood. Whether the improvements come simply from isolating the motor from line noise, or whether the power supply itself has a beneficial effect on the motor's rotational accuracy, is not clear. Suffice it to say that PLCs for turntables *do* work, and you should audition one. Note that direct-drive turntables and almost all cassette decks use DC motors driven from an internal power supply. They are already isolated from the line, so products like the VPI PLC will probably have no effect on their sound. However, it can't hurt to try. Just be sure the device doesn't overload the PLC; I don't think any of them can supply more than 20 or 30W; the VPI's maximum output is 20W.

The VPI PLC (\$300) is warmly recommended, and the new motor is worth getting just to keep your HW-19 up to date. The increased torque doesn't hurt, either. —BS

Parasound D/AS-1000II: \$725 **Parasound HCA 800II: \$365**

Following my reviews of the Parasound amplifiers last year (January, February 1988), the manufacturer sent along samples of the updated versions of both products. The updates primarily involve upgraded parts in critical circuit areas. As was the case in my review of the PS Audio 200cx, final evaluation of the Parasounds was delayed until the B&W 801F Matrices could be set up and run in. Having done that, I listened to the latest Parasound efforts. In addition to the 80Is, other associated equipment used was the same as that in my cartridge survey (this issue). The primary cartridge for this audition was the van den Hul MC-One, the alternate the Krell MC-100.

First, the DAS/1000II. If you recall, my previous audition of this amplifier found it competent, listenable, not irritating in any way, yet not truly transparent or involving. I feel rather the same way about its replacement. It was never really moved by its performance. It is not hard or transistory. It is, in fact, more than a bit soft-sounding, with a slightly forward, yet not truly "there" perspective. It did produce a moderate amount of depth, but fell well short of a fully developed sense of front-to-back perspective.

I compared the 1000II with two other amplifiers: the PS Audio 200cx and the latest Rotel RB 870BX. The PS is far more expensive and slightly more powerful (\$1950 and 200W *vs*

140W into 8 ohms), the Rotel slightly cheaper and less powerful (\$549 and 100W into 8 ohms). The face-off with the PS was no contest, the latter amp clearly having the better of it in every respect: clarity, air, three-dimensionality, and inner detail. The Parasound, by contrast, was rather dark and closed-in. An unfair comparison, perhaps, considering the price difference, but a useful point of reference. The match-up with the Rotel is a more reasonable comparison. It was clear that the Parasound had more sheer gutsiness in the low frequencies than the RB 870BX; the difference in power plus the Parasound's more elaborate power supply (see the original review) made that no surprise. And the Rotel did seem to display an occasional trace of hardness. But beyond that, the Rotel was a bit more open, with more of a cushion of air around each instrument. Ambience was more convincing, soundstaging more three-dimensional. None of these differences were striking, and the Rotel was itself considerably short of the standard set by the PS. Yet there was no doubt in my mind that the Rotel was more *involving* than the Parasound.

The 1000II is a respectable amplifier at its price. It has a gutsy, potent (though slightly soft) deep bass and an overall sound that is unlikely to offend anyone. It would be wrong to call it lacking in detail, but it *is* well short of a fully satisfying transparency. I could live with it, but I would be quite aware that something was missing.

The 800II is a more promising proposition. It's clearly in the same sonic family as the 1000II, yet I consider it the better-sounding amplifier. Yes, it's a bit closed-in, but less so. Yes, it lacks that real spark of life, but it has more of it than its big brother. More important, I found it more rewarding to listen to over the long and short term. I believe that was because of its ability to produce a convincingly three-dimensional soundstage with a neutral front-to-back perspective. Don't get me wrong—the 800II does not pretend to sound like a high-end amplifier; the soundstage was not of the eye-popping variety. It still fell well short of the transparency and inner detail, depth, and overall clarity of the PS. But what it *does* provide of these characteristics is unusual for so modestly priced an amp. It also shares the 1000II's clean, non-irritating sound. Its LF response was surprisingly potent for a budget amplifier, although it couldn't match its more powerful

sibling in gutsiness.

Cheap solid-state amps are plentiful. Cheap amps with a smooth, slightly sweet, yet respectably detailed and three-dimensional nature are rare. The 800II is such an amp. I can't get too excited about the big Parasound, but if you're looking for an inexpensive amplifier that won't force you to spend your listening sessions feeling deprived, I do recommend an audition of the Parasound 800II. —TJN

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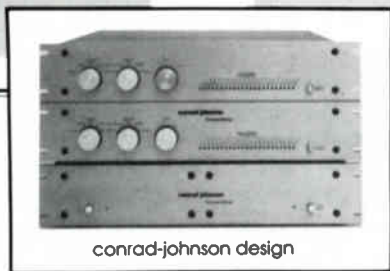
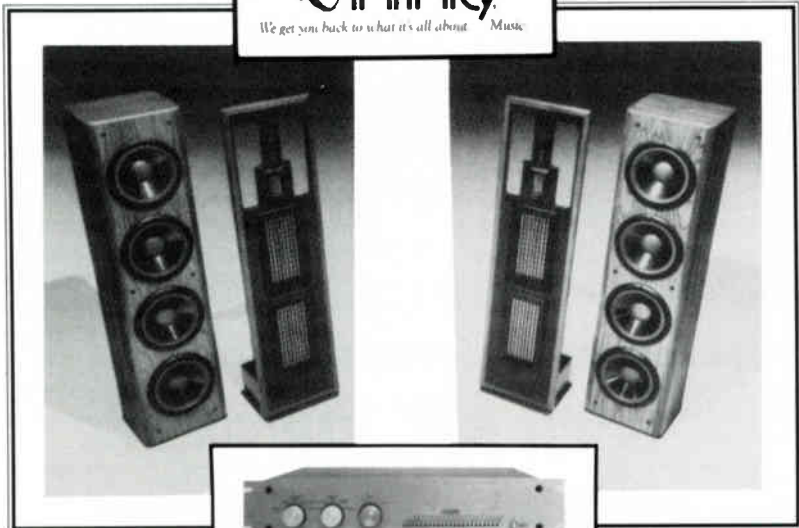
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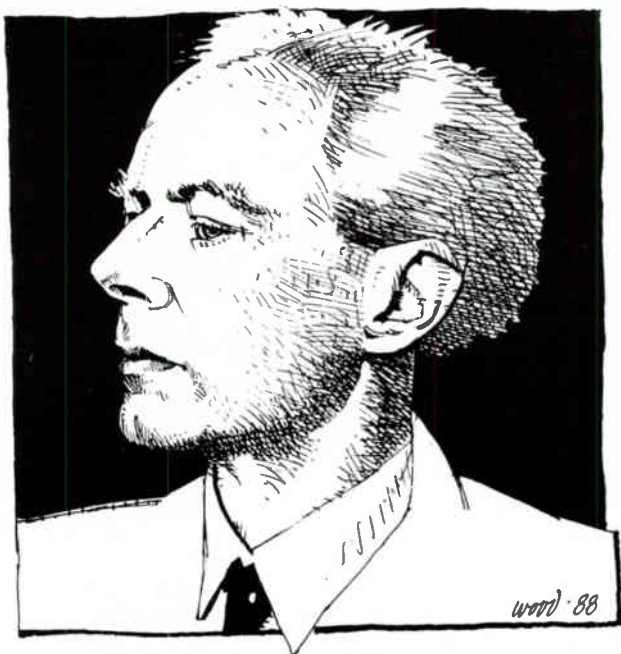
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Bartók's Music For Strings, Percussion & Celesta

Christopher Breunig

In a foreword to a DG "Dokumente" CD of Bartók's piano music (423 958-2) selected from the pioneering 1955 set by Andor Foldes, the pianist writes of his assimilation of, first, Bartók "the rebel," second, Bartók's "classicism," and finally his "romanticism." (Incidentally, Foldes's performances are void of the last element. In conversation with a colleague, pianist Zoltan Kocsis said recently that Bartók wanted the slow movement of his Sonata to be played "in quite a sentimental way.") The balance of these three elements changes with Bartók's own development; the First Piano Concerto, with its endless dis-

sonance, and the daring of the stark writing for soloist in the middle movement, typifies the rebel.

The spur to choose the 1936 commission *Music for strings, percussion and celesta* for this month's "Building A Library" was the series of Bartók concerts under Solti in London last November, and the timely arrival of Dutoit's technically outstanding recording. (The December *Gramophone* also carries a comparative feature on this work: pure coincidence!)

It was many years since I had heard the piece in concert, and I was struck by the orderly symmetries of the platform layout. Bartók pre-

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scribed in detail how he wanted the participants to be seated on stage, with the strings divided left and right, percussion and piano centered—Bartok once declined an invitation to play the pianoforte himself, saying that it was *not* a solo part. (It often tends to dominate, in recordings.)

The work was a response to Paul Sacher, who wanted a new composition to celebrate the 10th anniversary of his orchestra, the Basel Chamber Orchestra. Bartok wrote it between June and September for the premiere on January 21, 1937, where the finale was encored. Besides strings, the score has side drum, cymbals, gong, bass drum, mechanical timpani (which allow the pitch to slide—glissandi—in a controlled way), xylophone, celesta, harp, and piano. *Music for strings, percussion and celesta* did not receive its first recording until the LP era. I remember owning, briefly, that Capitol disc with Los Angeles musicians directed by Harold Byrns (a collector's item today!). Naturally, the work prospered in the stereo LP period, its colorful sonorities a challenge to recording engineers. But, as it happens, the two best versions musically bring technical reservations. . . .

One welcome feature of the CBS recordings by Pierre Boulez, in the late '60s, was the artist's own annotations. His comments on *MSPC* are revealing: He reminds us that the opening movement, a fugue opening fan-wise to maximum intensity, the back to its initial mystery, contains "not the least trace of a 'national' language. . . [is] the most 'intemporal' movement in all Bartok's music." *MSPC* alternates two pairs of slow and fast movements. The Allegros have folk-dance elements, but nevertheless "bear witness to a preoccupation with form quite foreign to so-called 'national' music" (Boulez). The themes are taken far from their folk origins. In the nocturnal Adagio (iii), a solo xylophone taps out a message, followed by poetic glissandi on timpani; the strings sing a mournful, or distanced, folk-like melody. The string pizzicati with the strings striking the fingerboard is a typical deployment of Bartok's. There are structural links between the movements, *eg*, the fugue theme in (i) returns the coda of (iv) at doubled time intervals. The melody heard in the taut development section of the scherzo (ii) is also the opening of the fugue line in (i). Halsey Stevens's invaluable book *The Life and Music of Bartok* (Oxford University Press, NY;

paperback edition 1967) gives a fine analysis with music examples.

If you wanted to take down the score from a recording, you could not do better than choose the new Montreal SO version under Dutoit, from Decca/London (421 443-2). Like various others, it is coupled with *Concerto for Orchestra*. This is one of Dutoit's more effective discs, although essentially it is "classical" Bartok, deficient in response to the wilder Hungarian elements. I wondered at first whether the stony acoustic of St. Eustache would work for this music: it does. The xylophone hammers in (iii) sound from far back; the tuned timpani pedals add a few atmospheric creaks of their own. The strings are somewhat thin in their upper registers.

Boulez's treatment of the nocturnal (iii) is highly individual, in a 1968 BBC SO recording for CBS (MK 42397), rather messily engineered with exaggerated separation between the antiphonal strings. A resolute reading, with a determinedly fast finale, this suffers from scratchy string tone, too (as recorded), and some hollow resonance. It is producer Thomas Z. Shepard's fault that the last movement fails to cohere: it is so busily "directed" at the listener. Rarer by far is an LP (also manufactured by CBS) issued from a 1971 Promenade Concert performance by the excellent National Youth Orchestra GB, under Boulez. Side One comprises the final rehearsal of (ii)—which is played, live, with gusto. A fund-raising release, this preserves the manner of a Boulez rehearsal: clipped, urgent, technical. So no anecdotes, and much of it obscured by the playing.

Karajan has made three recordings at different times, none later than '69 (on CD: DG 415 322-2). The then LP coupling was Stravinsky's *Apollo*. This is very much a virtuoso reading, sleek or hard-driven. Frankly, it sounds designed to show off the prowess of the Berlin Philharmonic; Karajan devotee that I am, I cannot feel that it serves the composer well. A more close-balanced BPO version from EMI/Electrola (1960, Angel CDM-69242) was far more idiomatic in feeling, yet broadly similar in key features. The dark, wailing drama of (iii) is affecting and original here, xylophone and pianoforte acting like speakers against a chorus.

Ferenc Fricsay, who was responsible for a major portion of the postwar Deutsche Grammophon catalog (with the BPO, or his own Berlin Radio Orchestra), recorded *MSPC* in 1953;

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his RIAS mono version was remastered in a retrospective series in '77 (2535 702). Worth acquiring if you ever see a copy. Fricsay was a remarkable Bartokian—he studied at the Budapest Conservatory—and his reading combines classical purity with intense feeling. The architecture is marble-hewn, yet Bartok's tragic side is always implicit. The sound is exceptional: tidy, with beautiful string tone, and bright, tangible percussion.

There's only one other version I value as much, and that stands in stark interpretative contrast. Fritz Reiner's Chicago reading (RCA 5604-2-RC—like the Bernstein/CBS, Karajan/DG, Boulez/CBS, with *Concerto for Orchestra*) first appeared in stereo form in 1960. It was produced by Mohr & Layton, coupled with *Five Hungarian Sketches*. String tone is harsh and scrawny; the piano is over-amplified; timps thump. But musically this is "high fidelity"—though Reiner is the rebel-romantic, laying on the cimbalom effects, stressing the Hungarian dance rhythms with earthy vigor. Marvelous finale! (Is he, though, too impatient with that final coda?)

In a 1977 Boston/DG recording, Ozawa takes a more subdued view of the coda—strings are subdued, too, in recording balance. Yet this is a well-produced (now deleted) Boston disc by Thomas Mowrey. Ozawa conducts a reading that is rather blandly generalized, but with imaginative flecks of color. He's best at the nocturnal third movement. So is Bernstein (now on CD: CBS MK 44707), in a rather effectively cleaned-up 1966 NY recording (there's an elusive Hungaroton CD—HCD-12631—of *MSPC* he made on a visit with the Bavarian RSO, which I have yet to come across). The Boston record suggests that Koussevitzky's influence was lost, but the NYPO sounds authoritative in Bartok, responsive too to every nudge from Bernstein *en passant*. The textures in the finale are jumbled by the engineering balance, and the tempi here are unacceptably mannered. A colleague described it as "for those who don't really like Bartok"!

Sadly, the two Hungarians who contributed a great deal to the composer's acceptance, the late Antal Dorati (London 414 894-2) and Eugene Ormandy (Angel CDC-47117), made disappointing accounts of *MSPC* in later years. Solti's LSO version of 1964 was a Decca/London sonic "special" (SXL6111, available well into the PolyGram LP pressing era: not to the

advantage of the sound, though). This was from a vintage period with the LSO, whether they liked him or not. The LP does offer fabulous Kingsway Hall sound, with that venue's unique bloom. Solti's electrical energies register here too, with lightning-quick dynamic changes, and motoric drive in (ii). A CD reissue is overdue.

First issued as part of the Philips/Hungaroton coproduction of the Bartok works with piano and orchestra, Ivan Fischer's Budapest Festival Orchestra version now reappears on a single CD (Philips 416 836-2) with the First Piano Concerto (Zoltan Kocsis is the soloist). Patently an authentic Hungarian reading, this is, I think, preferable to the Liszt Chamber Orchestra/Rolla version (Hungaroton HCD-12531-2), although that has the more useful Sacher-commissioned *Divertimento for Strings* coupling. The Hungaroton recording is both dim and over-resonant, and I find the reading too stiff and restrained, with little of the atmosphere of Fischer's in (iii). But, for all I know, most of the players are probably common to both ensembles.

Another superb analog recording, currently out of the catalog, is the Argo (ZRG567), with the St. Martin's Academy under Marriner. Marriner does so much nowadays that it comes as a shock to go back to the older recordings to realize their considerable commitment. The Adagio, taken very slowly, is deeply felt and with excellent care taken over intonation on the finished product. I don't think the sort of sound there, with enormous depth in the bass, and effective perspectives (bar one or two splotches that suddenly appear forward in the speaker areas) would transfer well to digital. Ideally a Real Cut reissue is wanted here, with high-quality vinyl pressing.

The polish and exuberance of the Academy isn't matched on the Nimbus recording directed by Yehudi Menuhin (NI 5086). The English String Orchestra responds well to Menuhin's utter seriousness of purpose—the unfolding fugue in (i) is impressive—but the stray intonation is noticeable. The *Divertimento* coupling is worth hearing. The discontinued ECO/Barenboim (EMI) had poor string sound, and was not very convincing; older recordings with Concertgebouw/Haitink, Suisse Romande/Ansermet, and LPO/Solti I have never heard. My recommendations are Solti, Fricsay, and Reiner—only this last easily found. **S**

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*Cellist Ofra Harnoy
talks with Barbara Jahn*

Ofra Harnoy was born in Hadera, Israel, in 1965 and began to play on a quarter-sized cello at the age of 6. The following year she moved with her family to Toronto, her musical studies continued, and at the age of 10 her professional career was launched. Now, with over 20 recordings to her name, she is becoming renowned the world over. I spoke to her the day after her Wigmore Hall debut in London, England, in January last year.

Prodigies are a flash in the pan, they fade out. Musicians play well from their first day 'til their last.

BJ: *When did you realize that you wanted to play the cello?*

OH: Well, actually, my parents chose it for me before I was born. Whether they had a son or daughter was not important; the fact that the first child would be a cellist and the second would be a clarinetist (which never happened as I was an only child) was all that mattered. My father played the violin, my mother still plays and teaches the piano, and they wanted to have a family trio; they had no idea of my becoming professional.

BJ: *Were you happy to stay with the cello under those circumstances?*

OH: There was always music in the house when I grew up, so when the cello was put into my hands it was quite natural for me to play. It was never a chore. I wasn't made to practice by being locked in a room; it was an enjoyable thing and part of growing up. My parents were very supportive and they always treated me like an adult, which made it easier to deal with other adults in my musical life. You see, being on a scholarship and at the Conservatory, I studied and learned with people who were 10 years older than me, and I performed with people who were 10, 20, 30 years older than I was.

BJ: *And how did you relate to your peers at school?*

OH: There were many different Ofras. There was the dreamer, the bookworm, and the kid who could fit in and get down to the level of other kids. But I actually went to the extent of changing my name when I changed schools, so no-one would recognize me when I was becoming more famous. It worked for about a year, then someone recognized me from an article and the school was covered with clippings of me, and people began to interview me rather than talk to me on my own level.

BJ: *Were you considered a prodigy?*

OH: Yes, anyone who is young and on the concert circuit is, but I always despised the title. I got fed up with headlines like "Child Prodigy Strikes Again," and all that garbage. I would make statements in every article, "I am not a prodigy," and then they would still print a headline like, "She Says She Is Not a Prodigy." But prodigies are a flash in the pan, they fade out. Musicians play well from their first day 'til their last. I've disproved them now; I haven't faded out. But I was very lucky. I think a lot of people who have talent are brought up the wrong way and are stifled.

BJ: *Your first live performance was with the Boyd Neel Orchestra when you were only 10. How did that come about?*

OH: That was very funny—I went to an audition thinking Boyd Neel needed extras for his orchestra, but when he heard me he said, "I want you to do two evenings of solo concerto." I was amazed, but very happy, and so I never actually got to play in the orchestra. I did two student recitals and Neel thought they went so well that I did an adult concert as well.

The best thing about being 10 was that I didn't know I was supposed to get nervous. Now I get nervous, when I know I must prove myself to the critics.

BJ: *Who were you studying with at the time?*

OH: I started studying with my father, who is not a cellist, so it was a very natural approach to the instrument—I almost found my own way through it. Then I studied with various conservatory teachers, some of whom held me back. You know, if you have the wrong teacher it completely takes away the desire to play. I was on plateaus for various lengths of time and I was lucky to get off safely. But my main teachers have been Professor Vladimir Orloff from the University of Toronto—I was on a scholarship to study with him—and William Pleeth in London, England. Then I had master classes with Jacqueline Du Pre and Rostro-

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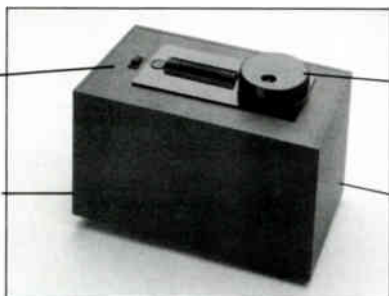
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povich when I was 14, and a few private lessons with William Pleeth, because even Rostropovich said he was the world's greatest teacher. The time I spent in England was so concentrated: I would have lessons that lasted hours, three or four times a week; then every night I went to see a different play. It was real cultural saturation and I really enjoyed it. Sometimes this would last for months if I wasn't touring.

BJ: *Which performers do you think influenced you the most?*

OH: All the time I was growing up my parents were constantly playing records, so I listened to everything, from opera to chamber music. When I was a little girl my idols were Jacqueline Du Pre and Rostropovich, but as I grew up I found I respected different cellists for their interpretations, and I couldn't really have a favorite anymore.

BJ: *What did you learn from master classes?*

OH: The main thing William Pleeth taught me was how to teach myself, how to explore the instrument, and how to listen to myself, which is very, very important. He taught me to experiment before I came to any conclusions. He wanted to bring out my own individual style. One of the main mistakes teachers make is to try to make the student a photocopy of themselves. The worst kind is the one who says, "first of all, forget everything that you've ever learned—we are going to start right from the beginning again." I had a Conservatory teacher with very long fingers—he could hold the bow with just his fingertips. When I did that it felt as if I was going to drop the bow, so in my lessons I was very uncomfortable, as he forced me to play that way. So, I'd go home and rebel by playing my way, and the whole thing became impossible. I was lucky to become a pupil of Vladimir Orloff, or I probably would have quit. I'm very careful with the students I teach. I try to guide them in William Pleeth's way, and it seems to work.

BJ: *How do you cope with the pressures of touring?*

OH: I enjoy it, actually. There are the tiring parts, and every once in a while I feel I'm living out of a suitcase, but I don't feel exploited or overworked. I've made friends in a lot of countries now, and I love seeing different places. I'm not a routine kind of person anyway; I would get bored.

BJ: *What about difficulties over practicing in hotel rooms?*

I'm not the kind of person who can just be turned on—I need to be inspired, I need to feel like I'm performing.

OH: I have a very disciplined routine for such times. I get up every morning and do physical exercises and cello exercises. Then I work on my program and probably the one for a concert in the next tour. Any free time I have at home is spent perfecting new things and improving old things, so I do find enough time. I don't really practice that much anyway, not like eight hours a day. The kind of practice I put in is very concentrated, and I find that I lose something if I keep going. Then it will come out as a very learned, boring performance with no spontaneity.

BJ: *Does an audience "lift" you?*

OH: Definitely. I feed off an audience. That's the one thing I find very difficult when I make a recording, playing to this insensitive metal object. And no matter how well you're doing it—you could do two hours of perfect takes—there might be something wrong with the equipment and you have to start over again. In a performance you just give, and you're drained at the end.

In the studio, I like to have people I feel comfortable with, like parents or good friends, because I have to play to somebody; I have to get into that frame of mind where I'm playing out or else I can't give. I'm not the kind of person who can just be turned on—I need to be inspired, I need to feel like I'm performing. But I like to have things down on record too, although people say I never play the same way twice. I like playing with sensitive pianists and orchestras because, if I have to give the same program nights in a row, I try to see it differently, come to it fresh and play it as if it's the first time. A recording is only true of my interpretation at that particular time.

BJ: *Do you often listen to your recordings?*

OH: Rarely. It's usually only when people say, "let's listen to your latest album," and then I put it on. What I've found about performances I gave when I was young, though, is that

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they're very valid and musical. Someone put on a recording I made when I was about 10 of a Bach organ toccata [RCA RCL-8399]. It was so beautiful and innocent, and I hadn't realized it was me playing. I'll probably never be able to play like that again because it was my own special interpretation at that point in my life.

BJ: *When you record now, do you spend a lot of time with the engineers discussing such things as balance?*

OH: I'm very picky about a good sound, and my father, who's been producing a lot of my albums, gets it absolutely perfectly with immaculate editing. He knows exactly what I want. He knows how to get everything out of me, too, whereas other producers always settle for less because they do it every day. I can play something a hundred times and he'll say, "No, you're capable of making it magical. Do it again," and I will, and get the magic, and that'll be the take we keep.

BJ: *And if he's not there when you listen to the playback, and you don't like it?*

OH: It's very difficult to judge, because you don't have all that much time. I might do an album in two days, and it will be impossible to listen to every little thing. You have to trust the person in the studio. Also, you can't really hear what the end product will be on the machine unless you really understand it.

BJ: *Have you ever accepted a recording you weren't happy with because of shortage of time?*

OH: It has happened with orchestras, when union restrictions have limited things. The recording I really wasn't happy with was the Beethoven Triple Concerto [RCA 71125], where the production was really sloppy. Somebody came on stage to fix the piano, moved the mike away from the cello, and as a result the cello makes a little, wimpy sound on the recording. That's really unprofessional, but there was no time to do it again as it was all done in one day.

BJ: *Who would normally decide on re-takes?*

OH: It's about even. I like to do large sections, like complete movements, but it's terrible if I've done two or three hours and they have to scrap the tape because they heard a buzz, or a bus went by. I just want to throw everything in the air and leave because I've given everything, I'm drained; my fingers are frozen because the heating is too noisy to have on, I can hardly walk because I've been in a sitting position for so long, and I know I have to start all

A recording is only true of my interpretation at that particular time.

over again.

BJ: *Does your performance deteriorate as you keep repeating a piece?*

OH: I have to psyche myself to the point where I'm performing again and again and can still reach a high standard. But at the end of the day I'm a mess—I'm completely mentally and physically exhausted.

BJ: *Which discs has your father produced?*

OH: The most recent are the Vivaldi Concerti, the Schubert Arpeggione, and the Prokofiev Sonatas [all RCA], which will be released soon.

BJ: *Why have the Vivaldi Concerti been neglected by cellists?*

OH: Maybe they seem too easy, but I'm crazy about them. For me Vivaldi's glorious crystalline music is like opening the curtains on a Sunday morning, with the sun pouring in. Many of the Concerti have never been recorded, and yet every single one is a gem. There are about 27 in all, and my first album includes 5, and one that is only a single movement. I shall record them all eventually on RCA.

BJ: *That first disc also contained a cello transcription of the Franck Violin Sonata. That's not an obvious choice.*

OH: I decided to do it because it was one of my favorites from an early age. I felt close to it, and when I performed it, it really felt good. The reason the other side has a lot of short pieces and violin transcriptions is because the producer of Masters of the Bow heard me play the "Zapateado" by Sarasate at a recital. He'd never heard it played on the cello, and it made a big impression on him. So he wanted that kind of thing to be on the record.

BJ: *You obviously like the sound of the violin.*

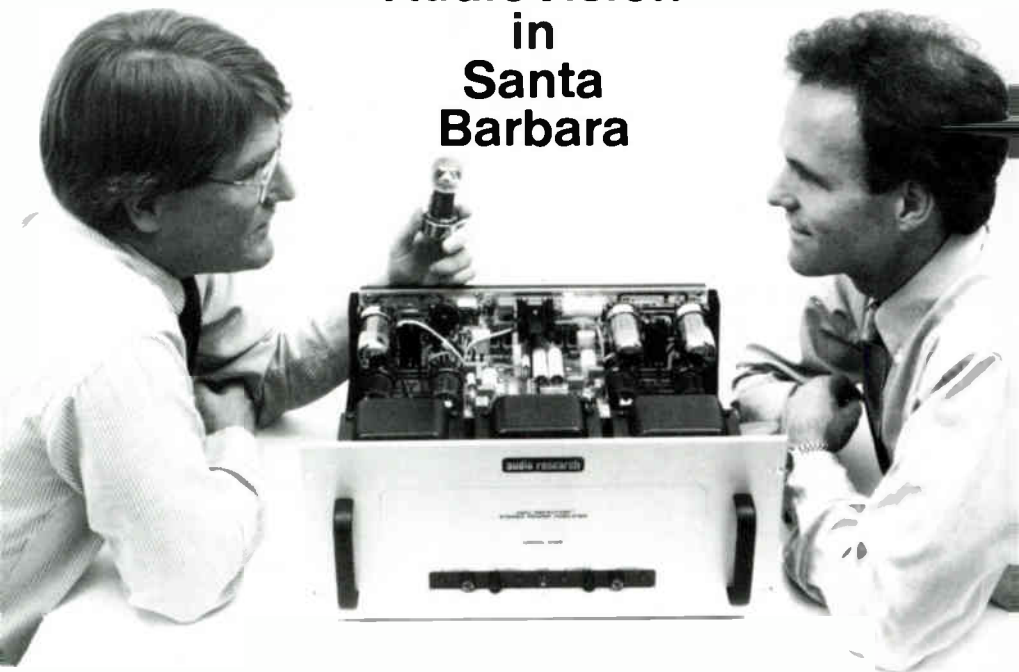
How do you achieve that on the cello?

OH: A lot of cellists, when they are in the upper register, still use the big, wobbly vibrato they use in the lower register. But there's such a short distance between notes in the upper register that if you use a tiny, intense vibrato it sounds like a violin. It's also very important to alter vibrato according to the mood of the piece; I don't ever use only one type.

BJ: *Are all your 23 recordings still available?*

OH: Many are on Canadian labels and have

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been licensed to RCA, so they should be. I've been with RCA Japan since about 1983, RCA UK and Europe since '85, and I've recently signed an international contract with RCA Red Seal, so my records should now be distributed everywhere.

BJ: *You've tended to record and perform works that are a little unusual: arrangements of Bach, Chopin, Debussy, Gershwin, and so on. Why is that?*

OH: Well, I play all the old warhorses over and over again, and I've recorded so many of them too, and I want to broaden the cello repertoire and show all those cellists who complain of its limitations that it just isn't true. I've been sent the Sullivan Concerto, and I've learned it, but I've never had an opportunity to play it. That's true of many pieces.

BJ: *The Offenbach Concerto, of which you made the world premiere recording [RCA RL-71004], was a great find. How did that come about?*

OH: The story goes that Offenbach's descendants found an old trunk in an attic with all kinds of music in it. The Concerto was among it and was immediately put in a museum and never played until Erich Kunzel (or maybe someone else) got hold of it. It's funny: Offenbach was a great virtuoso and it was written in the year that he stopped playing the cello, as if he was testing people out, handing it over to see who could play it. Anyway, Erich Kunzel asked me if I'd play it, and I gave the world premiere in Cincinnati. It was very challenging, and very lonely. I had an audience of 40,000 people—I beat David Bowie by 5000—at an outdoor concert. It was really glorious; I'll never forget it, because I had a standing ovation with the sunset and 40,000 people. It was an incredible power trip!

BJ: *Were you happy about recording the transcriptions of Beatles songs [Fanfare 6002]?*

I want to broaden the cello repertoire and show all those cellists who complain of its limitations that it just isn't true.

I don't see any reason why a classical performer can't have a little bit of fun and still be recognized as a 100% serious musician.

OH: My first impulse was, "No, I'm not going to do that." They needed a hot seller to make money and I refused. Then, when I heard the Doug Riley arrangements, I thought they were really fantastic, more like Schubert than pop, so I agreed to do it. Now the problem is that most academics or older people say, "Oh, Ofra Harnoy has sold out, she's gone pop, she's gone entertainment." I had a lot of trouble with that. If I'd been about 40, with an established career, I would have been able to do it. You hear a lot of male performers who move into jazz or rock, but it wasn't accepted when I did it. I don't see any reason why a classical performer can't have a little bit of fun and still be recognized as a 100% serious musician. But, being young and a woman, everyone was dying to find something to pick on. I'm not pretentious, and I'm completely sickened by snobbery, a thing there is a lot of in my field. The way people express themselves shouldn't set up social barriers.

BJ: *What is your mental and physical preparation for a performance?*

OH: The first thing I do is get through the notes. I almost memorize a thing before I've learned it. I scare myself because it's virtually instantaneous—I'm waiting for the day when I won't be able to do it anymore. I transform the notes into my own little visual lines and colors and textures and phrases. Then I practice by experimenting with different fingerings, and using different techniques. After I've got my own mental picture of it, I listen to other performers' versions to see what they think. Then I work with the pianist or orchestra in rehearsal.

BJ: *Presumably, you don't get much rehearsal time.*

OH: No, and I have different accompaniments all over the place. One of my favorite pianists is Michael Dussek. I take him to Canada and on tour with me whenever he's available. He's one of those people who plays really, really



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Some of the most magical moments I have created have come out of fantasies.

well but has no ego whatsoever, which is almost impossible to find in pianists. We need very little rehearsal because when we start playing we feel the music together, as if we've been rehearsing for years. But it's rare to find someone like that. Once he arrived in Toronto the night before a concert and we had two short rehearsals. But I've been in situations like that with orchestras too, where we've had a 15-minute rehearsal on a 20-minute piece and then we've played it in concert.

It all depends on how sensitive and good the conductor is, and whether all the performers have the same feel for the music. If not, no amount of rehearsal is going to do any good. I've had to play with conductors I couldn't stand, they were so full of themselves, and I couldn't stand the orchestra. There would be a feeling of hostility, but I just had to forget it. You have to deal with a lot of people like that. I've played with big names who, when they see a young woman, start patronizing and telling you how to play. I don't mind advice, but I don't like being told by a conductor how I should play—I want to interpret a work the way I see it. When it first happened I had no idea how to deal with the situation. I was so depressed I phoned my manager and my father—I phoned everyone—and they said, "stand up for yourself." I'm not an aggressive person and it took all my energy to do this. I had to mentally prepare, talk to myself, take a deep breath and say, "I'm sorry, excuse me sir, I am willing to discuss this with you but please let me interpret this work in my own way." The whole orchestra clapped, because he'd been a jerk to them too, and insulted them. After that, the concert went fantastically. He was very humble and followed me exactly. The funny thing was, the review said the conductor should have taken lessons in sensitivity from the guest soloist.

BJ: *Why did he presume he knew better?*

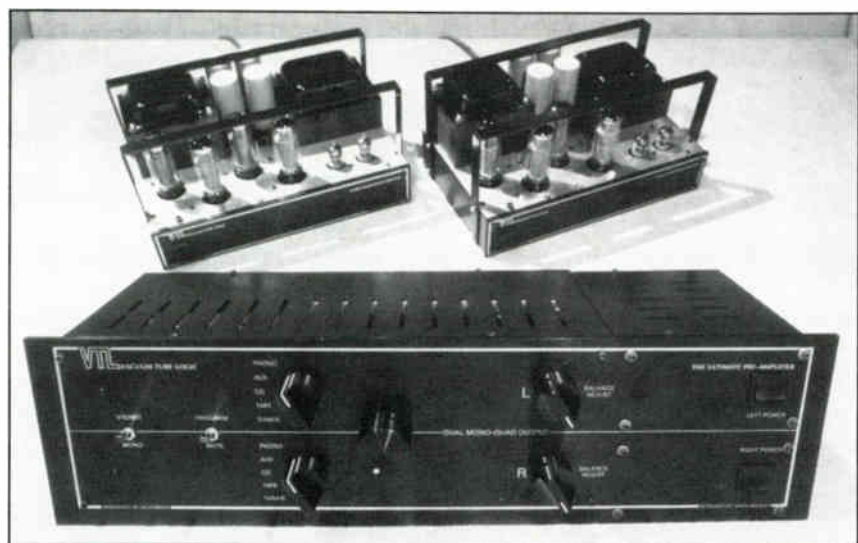
OH: Because I was young and a woman. I've always had to work twice as hard to prove myself. Older males are taken much more seriously. Immediately for me it's, "Oh, she's getting away on looks; she can't possibly be any good." I have to prove constantly that I'm as good as my last record and review. I've even had trouble with stagehands. I was once given a podium so tiny my cello didn't even fit on it, and I was told, "Well, Janos Starker played on it, why can't you?" And I said, "Well, when

Starker comes, tell him I play on a big podium." I've also played with pianists who purposefully played loudly in my soft passages, and all sorts of little vindictive things like that. There are all sorts of professionals: there's the sensitive musician who is only out to give a good performance, and then there's the professional who is not a communicating musician. He may be technically good but his performance is lifeless; there's no humanity, a computer could do as well. Sometimes it's because performers overpractice and get stale, other times it's because they got there by sheer hard work but have no musicality or natural ability. People like that aren't meant to be musicians.

BJ: *What advice would you give a student who wanted to become a professional musician?*

OH: Get as much exposure on stage as you can, because you have to learn how to play for an audience. As an artist you may be able to play wonderfully in the living room, but get on stage and you might be totally paralyzed. You have to learn how to pace yourself for a recital, how to give, how to transmit the right vibrations. The way I did it was to enter competitions when I was young. I went in for as many as I could just to get experience, from the age of 8. I enjoyed it. I got to learn different repertoire. Then don't let it go to your head, always be critical of yourself and listen to yourself. It's very easy to become conceited when people praise you and give you good reviews, and it's also very easy to become depressed by negative reactions. You must always believe in yourself and always work toward what you want. Keep your own style, your own interpretation, but listen to a lot of music because that opens doors and helps you form opinions. Then you must try to feel the music you play, bring out your own personal feelings through the instrument for a really special performance. Sometimes I imagine myself as someone else who is living through an emotional experience, in order to get the right feelings across in the music. Some of the most magical moments I have created have come out of fantasies. **S**

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The Absolute Sound Vol. 13, Issue 53, May/June 1988, pp.67-73.

Titled 'The VTL Monoblock 300 Amplifiers'

John Nork

The Absolute Sound. Vol. 13, Issue 55, Sept./Oct. 1988, pp. 49-61.

Titled 'A Tale of Three Amplifiers'

As TAS doesn't allow actual "quotes", suffice it to say that the VTL 300 is JN's new reference amplifier.

Aaron Shatzman

The Absolute Sound Vol. 12, Issue 29, Fall 1987, pp. 85-95.

Titled 'TUBES TRIUMPHANT'

or Two Preamplifiers from VTL in which the Author Touches upon the Ticklish yet Timely Topic of the Transistor Twilight and asks if the Dark Chill of the Solid-State Night has finally been Banished by the Warm Gold (aero) Glow of a New Valve Dawn.

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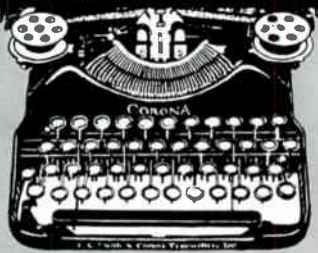
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RECORD REVIEWS



Classical

JOHN LUTHER ADAMS: *Forest Without Leaves*
Julie Burud, mezzo; Arnee Mitchell, alto; Kathy Daku, soprano; James Orvik, tenor; Morgan Reed, baritone; Birch Pavelsky, bass; Arctic Chamber Orchestra & Choir, Byron McGilvray
Owl Owl-32 (LP). Robert Schumaker, eng.; Thomas Steenland, prod. TT: 52:37

John Haines, whose poems are here set to music by his fellow Alaskan John Luther Adams, says, "The phrase 'forest without leaves' . . . contained an image that would stand for the modern world—to speak, as phrase and image—for a world bereft of spiritual value and physically threatened with destruction." Greek scholar Oliver Taplin wrote, "As soon as the message of a work of art is reduced to a sentence it becomes banal."

As sincere as the poet and composer are, as enjoyable as the music is, and as much sympathy as we may hold for its message, *Forest Without Leaves* still largely falls within the compass of Taplin's dictum: The sound of the grinding of an axe is ever present; the hackneyed imagery intrudes on the technically accomplished verse throughout.

This 1984 work for orchestra, chorus, and vocal soloists has a message; it is not subtle: "To see in a forest / so much lumber to mill, / so many ricks to burn; // water into watts, / and soil into dust, and / flesh into butchers' cuts— // and we ourselves are / numbered: so many factors / filed in a slot."

Adams, to his credit, does not attempt to unify the work with elaborate schemes, relying instead on a few simple motifs to create a pleasing cohesion. The sparse orchestration is clean and fresh, the composer's indignation turbulent and forceful. Adams makes extensive use of recitative and simple recitation, punctuating the text's message with vocal sound effects.

Hints of Bernstein, Copland, and Delius surface momentarily, but not derivatively; the music is fresh and original in the contemporary idiom, but never far from tuneful. Of the 16 brief sections, the most memorable are the

eleventh, which poses choral chanting above a doleful drum rhythm, and the twelfth, which is melodically stunning.

The voices, though not first-rate, are nonetheless emotionally honest and free from major flaws. The lower ranges of almost all the soloists are awkwardly overtaxed at times, and the ensemble work of both chorus and orchestra is rather rough. Apparently the important thing here was to get on record a piece of music that the parties involved believed to be important.

Owl Recordings did just that. Owl is an earnest-seeming nonprofit organization, "releasing recordings of high artistic, educational or historical worth not otherwise available." Its motives are to be applauded; one might wish for slightly improved sound quality, however. While tone colors are faithfully rendered in the lower registers, things get fairly hot and strident in the upper, especially on strings and brass. The chorus and soloists are very cleanly recorded and exceptionally well delineated in space. The DMM surfaces are impeccably clean and quiet.

Despite all I find "wrong" with this release, I can't deny an affinity for its intentions or the enjoyment of listening to it. Only on a grander scale do I feel that it fails, but it is definitely worth your time. It hasn't made its last appearance on my turntable.

The LP is available from Owl Recordings, Inc., PO Box 4536, Boulder, CO 80306.

—Robert Hesson

ALBENIZ: *Iberia, Navarra, Suite Espanola*
Alicia de Larrocha, piano
London 417 887-2 (2 CDs only). John Dunkerley, eng.; Paul Myers, prod. DDD. TT: 125:26

Evocative, romantic, moody, dreamlike, sensuous, playful, virtuosic—these are all apt descriptions for the various sections of Isaac Albeniz's elaborate 12-movement *Iberia*, one of the monuments of early 20th-century piano literature (1906–1909). Alicia de Larrocha has long been identified not only with Spanish music but with these pieces in particular, having already recorded *Iberia* three previous

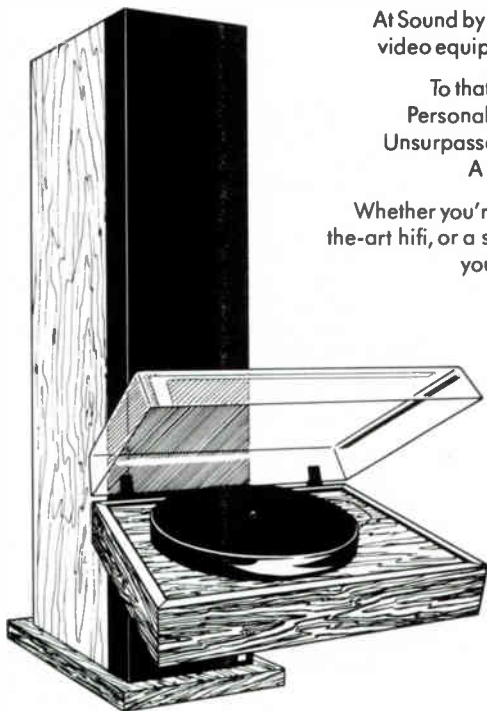
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times. She performs these works, adding as finale, as is usual in the performance of this music, *Navarra*. As filler she has supplemented this generously conceived program with an earlier compilation by the composer, the *Suite Espanola*, a group of eight movements that for many, including those guitarists who love transcriptions of some of the music contained there, epitomizes Spain. In the case of this recording, one that has given me enormous pleasure through its unparalleled interpretative heights, as well as its warm, glowing piano reproduction, it seems quite unnecessary to add any further praise. It is, simply, a superb album.

—Igor Kipnis

BACH: The Six Cello Suites

Pablo Casals, cello

EMI GHS 7 61027-2 (2 CDs only). Keith Hardwick, eng.

ADD. TT: 130:22

How can one review such a disc? Casals, surely, is the Bach Suites. It is thanks to him that complete performances of them, rather than single-movement extracts, ever came to be given in concert, and as a result the previously held opinion that they were cold, academic works could be reassessed. It is probably well-known now that Casals chanced upon the scores when he was browsing in a secondhand music shop at the tender age of 13. It wasn't until he was nearly 25, though, that he felt he had worked on them sufficiently to play them in public, and it was to be another 35 years before he could be persuaded by HMV's Fred Gaisberg to record them for posterity.

Keith Hardwick has done a fine job in transferring these from 78s. There are the inevitable hiccups: sudden clipped notes and loss of ambience at the end of dances, changes of positioning and ambience (this is most noticeable in Suites 4 and 5, which the notes tell us were recorded over four days), and the ubiquitous hiss that gives away the age of the originals. But what does emerge without any doubt is the strength and character of Casals's playing: his intuitive feel for phrasing, his range of tone color in differentiating between melodic and accompanying lines, his subtle use of vibrato, and his exciting powers of communication. This is a wonderful issue.

—Barbara Jahn

BEETHOVEN: Missa Solemnis

Tina Kiberg, soprano; Rosemarie Lang, alto; William Cochran, tenor; Mikhail Krutikov, bass; Thomas Brandis, solo violin; University of Maryland Chorus, European Symphony Orchestra; Antal Dorati

BIS CD-40617 (2 CDs only). Siegbert Ernst, eng. DDD(?)
TT: 112:36

This performance, recorded live on July 8, 1988, in the wonderfully resonant Philhar-

monic in West Berlin, is preceded by an eight-minute life-affirming speech in German (the English text is provided in the accompanying booklet), and followed by 23 minutes of rehearsal, mostly in English and very entertaining and informative. But naturally, any prospective buyer will be more interested in the performance itself (although I hasten to add, editorially and unauthorized, that all proceeds from the sale of these CDs will be donated to "victims of atomic explosions and IPPNW projects in developing countries"). And while far from being the finest *Missa* imaginable, it certainly can hold its own, for the most part, against the competition.

The late Dorati was an old master, and his firm leadership is in evidence throughout. Never an eccentric conductor, he offers a passionate if straightforward reading which occasionally rises to great heights. His "In gloria dei patris" is deliberate in the extreme, but very effective as such, and the airy, light "Et vitam venturi" is a marvel—the University of Maryland's sopranos should be very proud of themselves. Dorati seems to have gone for the more ethereal side of this work, allowing the bombast to take care of itself. It works. The solo flute in the "Et incarnatus est" has never sounded purer or clearer (the engineers, too, should be praised), and Thomas Brandis's solo violin playing is a knockout. The European Symphony Orchestra, whoever they may be, are suitably involved and professional.

The soloists leave something to be desired. Danish soprano Tina Kiberg, just 30 years old (and already a very fine *Rosenkavalier* Marschallin), is quite good, Rosemary Lang a bit less so. Tenor William Cochran is a chore to listen to throughout, however, and bass Mikhail Krutikov fails to impress.

The sound, balance, and ambience in general, as hinted at above, are excellent, although I'd suggest a treble boost. There are only four cueing points on the first disc and three on the second—a cheap oversight. But there's much to take pleasure in here—and to editorialize again, it can't exactly hurt the cause of world peace to buy this. In short, a good bet, male soloists or not.

—Robert Levine

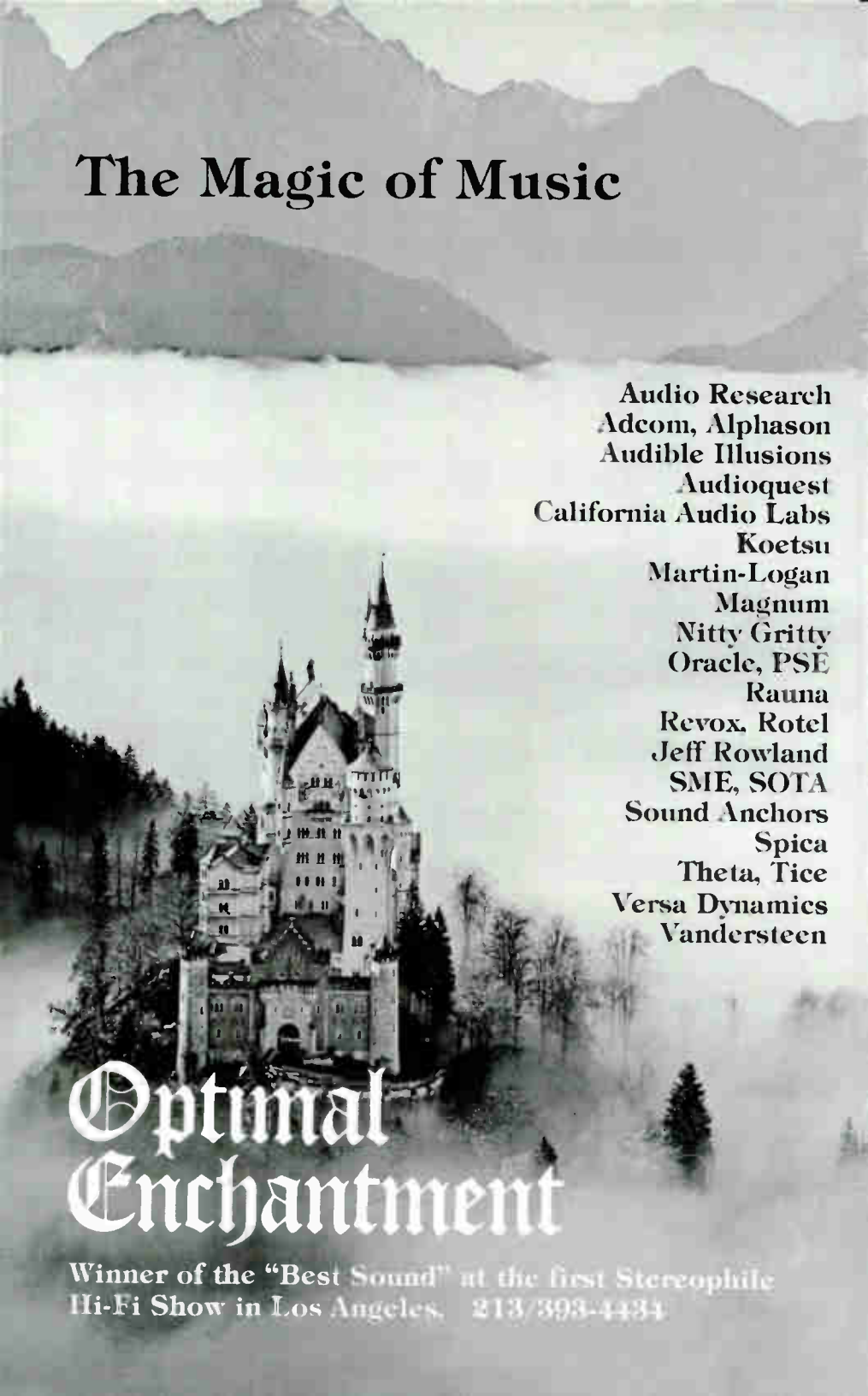
BIZET: Les Pêcheurs de Perles

Alain Vanzo, Nadir; Gabriel Bacquier, Zurga; Jeanine Micheau, Leila; Lucien Lovano, Nourabad; Manuel Rosenthal, Chœurs de la RTF et Orchestre Radio-Lyrique

Le Chant du Monde LDC: 278 913 (mono CD only). AAD.
TT: 98:00

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here on another one of those double-play CDs which require either a switcher or a mono button on your preamp, and the sound is surprisingly good, if a bit shallow, for a radio transmission 30 years old. The live broadcast was apparently without audience, but the ambience is exciting; indeed, conductor Manuel Rosenthal, an old master with the French repertoire, makes the drama (such as it is) come alive. He is aided by a particularly vibrant and sincere cast who seem totally involved in Bizet's little bit of exoticism, and do not condescend to it.

Perhaps the most charming thing about this release is the accompanying booklet, which, in addition to containing a French-only libretto, contains a snapshot of an unidentified man (probably Alain Vanzo), and a synopsis which includes the words "Bizet has invested a libretto that makes one hesitate between tears and hilarity. . ." and "Introduction: We are in Ceylon seen through the eyes of a Parisian composer in the reign of Napoleon III." A treasure trove, no?

Those bonuses aside, we have Vanzo; I doubt whether he has ever sounded better than he does here as Nadir (perhaps the worst name a tenor hero has ever had to endure). I still keep my Nicolai Gedda performance (once available on Angel 3603 B/L, but long gone) near and dear, but Vanzo is breathtaking. There is a suaveness, sweetness, and elegance to his singing which is unmatched by any other tenor I have heard, and, somehow, I'm convinced that he is the last of the great French stylists. Sad, but true—and luckily we now have this souvenir. His rendering of "Je crois entendre encore," perhaps the most beautiful aria in the French repertoire (here shorn of its phony high C ending), is more lovely and wistful than any I've come across.

The score's other highlight (well, maybe there's another one or two—but it's arguable), the great first-act duet, is gorgeously served by Vanzo and a young Gabriel Bacquier as Zurga—their mellifluous blend is creamy and classy, not to be missed. Elsewhere, Bacquier is properly heroic and imposing. Jeanine Micheau, the Leila (and the Leila of the aforementioned Angel set as well) is pretty third-rate—blank and uninteresting, with few colors to the voice, though, at least, accurate. Lucien Lovano, a bass I've never heard before or since, is a dandy Nourabad, adding a nice continuo sound to the ensembles and a richness to his solo moments.

The whole show is divinely idiomatic under Manuel Rosenthal's leadership—this is a performance which would have been a pleasure for the *fin de siècle* crowd. The orchestra is marvelous, the chorus less so. There is no com-

petition for this release on CD, but even if there were, I'd put my vote here. This is a soft-edged delight, and I recommend it highly.

—Robert Levine

LOU HARRISON: Piano Concerto; Suite for Violin, Piano, & Orchestra

Keith Jarrett, piano; Lucy Stoltzman, violin; New Japan Philharmonic, Naoto Otomo; others
New World NW 366-1 (LP), -2 (CD). John Newton, eng.:
Elizabeth Ostrow, prod. DDA/DDD. TT: 51:51

Lou Harrison's 1985 Piano Concerto, dedicated to and written for Keith Jarrett, is here considerably, committedly played by the dedicatee. As a concerto, it's a somewhat patched-together, neo-classical symphony with piano accompaniment and four movements of decreasing size, in all much like the Brahms Concerto 2. Like that massive piece, it comes out as less than the sum of its parts—unlike it, it hardly qualifies as a masterpiece.

Scored for strings, two harps, three trombones, and a large percussion section, this oddly proportioned concerto seems written in several different musical languages at once. The first movement's thick, Brahmsian blend of Copland and classical Chinese flavors will sound surprisingly romantic to anyone familiar with Harrison's last release, *La Koro Sutro* (New Albion NA 015 CD). The scope is large and dramatic, with plenty of bravura passages furiously attacked by Jarrett. There follows *Stampede*, as if written by a different composer from a different discipline altogether, a gamelan of tortuous rhythms sounding like nothing so much as one of Jarrett's own more percussive piano improvisations (as on *Concerts*, ECM 1227, nla). There's fun and wit here, a three-way split of Jarrett, Bali, and Bartok, all adding up to hearty Harrison. The rhythmic drives of composer and pianist are irresistible. The *Largo* is of some beauty, but was episodic enough to remind me of filmless movie music. And the final *Allegro moderato*, a brisk little afterthought, is entertaining, no more.

The concerto was written for a piano (and sections of the orchestra) tuned to "just" tuning, which preceded the present "well-tempered" standard. The harmonics are craggier, more astringent, never quite resolving into the well-tempered mellowness we're used to, and give the concerto a taut, fresh feel.

It's easy to see why the piece appealed to Jarrett—it seems (and, we must assume, was) tailored to his own disparate strengths of rhythm and romance: he gets to be Liszt in the first movement, Bartok and Prokofiev in the second and fourth, and Debussy in the third. Such a *tour de force* may not hang together, but

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Jarrett's palpable passion and commitment bridge most of the gaps.

The 1951 Suite for Violin, Piano, and Small Orchestra (10 pieces), in six short movements, is considerably more delicate and far more finely wrought, like the oriental delicacy conjured by its many Chinese influences. Harrison achieves remarkable counterpoint in the "Overture," shakuhachi-like stillness in the "Elegy," full orchestral textures (with a touch of Geršwin) in "First Gamelan," Orff-like grace in "Aria," an open-chorded Coplandesque Chinese hoedown in "Second Gamelan," and loving peace in the closing "Chorale." Again, however, film music came to mind; oriental themes played on traditional western instruments always remind me of Hollywood. Nonetheless, this clear, refreshing music should be programmed in more chamber music programs.

Jarrett plays well, always serving the music before himself. Violinist Lucy Stoltzman, however, is hardly of world-class mettle, her thin, ill-controlled tone consistently undermining any trust in her capabilities. The ensemble of oboe, harp, celesta, tackpiano, tam-tam, bass, and two each of flutes and celli play in self-effacing concert.

The concerto, recorded live in Tokyo, sounds flat, dry, boxy, and dead, the orchestra somewhat dwarfed by Jarrett's piano, as if playing in a long single file directly behind him. Very mono. The New York recording (RCA's Studio A) of the Suite is considerably better, but all of the instruments still sound dry and thin, winds and strings having little or no body; perhaps this lack of resonance accounts for an initial illusion of clarity that disappears upon inspection.

The music is very good, with all the right ingredients; now, if Harrison could only bring to the architectonics of his compositions the vitality with which he so strongly invests each bar, we might have a Great American Composer.

—Richard Lehnert

HAYDN: Symphonies 90 & 93

Frans Bruggen, Orchestra of the 18th Century
Philips 422 022-2 (CD only). Dick van Schuppen, Eva
Blankespoor, engs.; Siewert Vester (90), and Gerd Berg
(93), prods. DDD. TT: 51:09

This is the first record made by Frans Bruggen that proves a major disappointment. Its flaws are many. Period instruments sound tonally coarse, strings in particular having a harsh nasality. Then, too, both symphonies are distorted by little mannerisms in dynamics, phrasing, and rhythm: sometimes an arbitrary swell or diminuendo is imposed; in the Trio of the Minuet of 90, the tempo suddenly accelerates,

fracturing the line and destroying the *natural* contrast that Haydn built into the music. And at some cadential points, chords requiring strong accents are played so gently, the music sounds squeamish and prancing rather than vital and assertive. On top of this, some tempos seem utterly arbitrary, especially those for the two closing movements of 93, its Minuet (marked *Allegro*) racing along, its finale (having the even faster indication of *Presto*) dragging its heels.

There are, to be sure, some virtues here: the color of period instruments is often refreshing, and Bruggen does respond to some of the peak moments in each work, especially the hilarious flatulent bassoon in the slow movement of 93, perhaps the most striking example in the literature of musical scatology. And the conductor clarifies how the *Adagio* that opens the first movement of 90 is pregnant with the thematic motifs that unify the ensuing *Allegro*. But he also misses points, notably the wit in the delicious false climax at the close of the finale of that work. And I question his judgment in obeying the second repeat (of development and recapitulation) in that score's first movement, a practice that stretches it to disproportional length.

The shortcomings of this release prove particularly unfortunate with respect to 90, for which I have heard no first-class version since the deletion of the old Vanguard recording made by David Blum. Two magnificent accounts of 93 are available on CD: a rather hissy, harsh, 20-year-old CBS edition in which George Szell, with the Cleveland Orchestra's modern instruments, produces as much color as does Bruggen and suggests far more of the music's wit, drama, and unity with playing that is far more disciplined. And for those seeking superb modern sound, Sir Colin Davis's account with the Concertgebouw Orchestra (for Philips) boasts beautiful definition, suave orchestral execution, and a Classical yet velvety sonority that expose the quintessential Haydn.

—Mortimer H. Frank

LISZT: *Annees de Pelerinage, Deuxieme annee: Italie*

Alfred Brendel, piano
Philips 420 169-2 (CD only). DDD. TT: 47:53

The music of this collection and that of the first book, Switzerland, dates back to the four years that Liszt and his paramour, the Countess Marie d'Agoult, spent traveling together through that country and Italy; the present pieces were created, reworked, and revised between 1837 and 1849. For the most part less overtly virtuosic (though requiring enormous technical resources), these poetic utterances are among

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Liszt's finest creations. Although individual excerpts from Liszt's second book of *Years of Pilgrimage* have been recorded far more frequently than integral sets—notably the final "Dante" Sonata and the three Petrarch Sonnets, which were originally songs—the complete group of seven pieces out of this three-part collection have been set down by a fair number of pianists, among these Aldo Ciccolini, Lazar Berman, David Bean, France Clidat, Jerome Rose, Wilhelm Kempff, Pascal Roge, Jorge Bolet, and Alfred Brendel, the first time for the latter in 1973 and now for the second time digitally in a 1986 taping. So far as CD versions are concerned, however, Bolet's is the only competitive performance. Brendel, highly poetic and probing, obviously thinks of these individual movements as having an underlying connection, for the sections follow each other with little pause. A feeling for continuity, however, is not the only interesting interpretative aspect. The pianist catches the moods of the pieces particularly well; seldom has the yearning of the opening to Sonetto 104 been captured so well, the somberness of *Il Penseroso* so gloomily conveyed, and there is plenty of rhetorical gesture in the hellish scenes of the "Dante" Sonata. Other performances can offer other insights, some of them more grandstanding, more glittery. But I find this a first-rate disc in all ways, and that includes the unexaggerated, warm, and very natural piano reproduction.

—Igor Kipnis

MAHLER: Symphony 1; *Lieder eines fahrenden Gesellen*

Ann Murray, mezzo; RPO, Andrew Litton
Virgin VC 790 703-2 (CD), 790 703-1 (LP). Mike Clements, Mike Hatch, engs.; Andrew Keener, prod. DDD.
TT: 70:55

Ann Murray gives one of the most exquisitely beautiful performances of these songs I have heard; her control at pianissimo and beyond is quite magical and, while their simplicity is never forfeited, the full pathos of these laden texts is sensitively wrought. Throughout, Andrew Litton commands the same degree of control and respect, and this permeates the score of the thematically linked Symphony 1 as well.

I was hoping that the dawn colors of the symphony's awakening, its hazy stillness broken only by fragments of birdsong and far-off horn calls, would be equally magical. Instead, Litton's vision has the freshness and chill of an autumn morning, the gathering climax heralding the more exacting exhilarations of the day to come. This exuberance, which is carried through the scherzo, balances perfectly with the ironically parodied funeral march. The

cymbal crash that opens the fourth movement is surely too loud if it can surprise even when expected, but it does in some way symbolize the way Litton commands attention here: the huge pendulum-swing of dynamics, the headlong gallop that suddenly slows to a dreamy, ambling introspection, the detailed unfolding of textures—which combination of these will disclose his carefully considered interpretation next?

There is little significant difference between the excellent clarity and focus of the LP and CD formats, but I think the latter's quiet surfaces better transmit the full impact of Litton's breathtaking pianissimos. —Barbara Jahn

MAHLER: Symphony 4

Helmut Wittek, boy soprano; Jaap van Zweden, violin;
Concertgebouw Orchestra, Leonard Bernstein
Deutsche Grammophon 423 607-1 (LP), -2 (CD). TT:
57:07

MAHLER: Symphony 5

Friederich Pfeiffer, horn; VPO, Leonard Bernstein
Deutsche Grammophon 423 608-1 (LP), -2 (CD). TT:
75:00

Both: Klaus Scheibe, eng.; Hans Weber, recording supervisor; Hanno Rinke, prod. DDA/DDD.

Be it noted: Not all that Mahler wrote is pessimistic and morbid. Consider Symphonies 4 and 5, written at the prime of Mahler's middle age, full of active living rather than the jejune and theoretical, as with 1 and 2, or the desperately reflective, as 8, *Das Lied*, and perhaps 9. Most Europeans have had difficulty, in the hindsight of postwar existence, in balancing wholeheartedly the overall optimism of these two works with their tragic elements, some conductors tending toward blandness, as Haitink and Kubelik, or polish without ideas, as Karajan. Bernstein, in his NYPO cycle from the '60s, encountered quite a different problem coming from a different direction: because of the constant assertion of his own public image as a deracinated urban neurotic, unsteeped in European culture, his interpretations of Symphonies 4 and 5 were forced and willful in a way that, say, the equally intense but less parochial Third and Sixth were not.

What a world of difference there is after Bernstein's long affair with Europe—that "Muse across the River" which Harold Schonberg correctly pegged as luring him away from New York 20 years ago. His new Concertgebouw Fourth is among the best in a crowded catalog, positive and ebullient where the NYPO was straightjacketed. It compares favorably with Mengelberg's recently reissued 1939 reading with the same orchestra, similarly impetuous in technique, but finding dark clouds of contrast where Mengelberg doesn't, building up a dramatic setting for the child-protagonist's

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heavenly triumph. Where Mengelberg is fast and loony in the almost-Tchaikovskian passages beginning at fig. 10 of *iii*, Bernstein is just as loony but also controlled, resolving the movement in a unique *tour de force*, making of this music a great 80-bar copula bridging the Tchaikovsky with Mahler 2 and with Bruckner, all by way of preparation for the Finale's return to mythic *Wunderborn* roots. Amazing, this: Bernstein's NYPO Fourth was all bent out of shape to accommodate a view looking back from the Fifth, with heavyhanded emphasis of the first-movement motif that became the funeral march from the later symphony; the new version unfolds much more naturally as a maturation of Symphony 2's concept of Paradise, with quotations of the Resurrection theme thoughtfully adumbrated (mm. 299-302; fig. 13).

The last movement was the saving grace of Bernstein/NYPO because of Reri Grist's unaffected and childlike soprano. Bernstein's new reading goes one better, using a real child, a boy soprano from the Tolz choir named Helmut Wittek. Wittek sings with the expected lack of archness, but also with surprising fullness and vigor, and as much control as many adult women have displayed in the role. He also has a lot more fun: After his long *glissando* down to low B, one knows that St. Ursula is really guffawing. Only one complaint: the very close-up miking of the singer, no doubt a safeguard against the balance problems which plagued Bernstein's 1984 world-tour performances of this symphony with the VPO and a different boy singer. Those who remember hearing—or, more accurately, *not* hearing—the boy in those performances will welcome the technical intrusion.

Just as there is an abundance of good recordings of Mahler's Fourth, there is a paucity of notable Fiftths. The symphony seems to elude most conductors. Not just duff conductors, either: Klemperer never programmed it, in part because he thought the *Adagio* smacked too much of cafe music. Bernstein too missed the point in his NYPO reading, which was poorly thought-out and indifferently played. His Vienna reading is in every way better, and for many will demand a first recommendation, surpassing even the classic Barbirolli/New Philharmonia recording from the late '60s. While Barbirolli emphasizes the ripe middle-ageness of the symphony—Klemperer's music of the cafe: very Viennese, bourgeois and a bit threadbare, always with a glint in the eye—Bernstein's Fifth establishes itself immediately as a statement of significance, opening with a literal funeral march far slower than with the NYPO.

The second movement begins furiously, Bernstein establishing structure in this work better than anyone in my experience, this differentiation of tempo and texture defining the symphony as something far richer than the succession of allegros critics have sometimes held it to be. In Bernstein's hands, the movement becomes virtuoso music, containing some of Mahler's greatest conventional (*ie*, pedal-centered) counterpoint, its alteration of sweetness and savage struggle a clear precursor to the *Rondo Burlesque* of the Ninth. In a bizarre sense, only an American could pull off such a reading today. A European might feel danger in the pit of his gut from such Faustian striving in music which is so earthly and temporal, without the Ninth's possibility for cosmic abstraction. Recording with the NYPO, Bernstein had only the Faustian ambition; now he has also the European cultural and performance tools.

The fourth-movement *Adagio* was the high point of the New York reading, a delicate gem contained within an indifferent performance of the symphony. With the VPO, it's right in context, given the expressive weight one might expect from a full-orchestra performance of Schoenberg's *Verklärte Nacht*, a reminder of how outrageous the scoring and harmony must have sounded in 1904.

Bernstein ties everything together in the Finale, the grand polyphony and brass chorales of the second movement brought again to the fore. Again there rises the ghost of Bruckner, a composer usually inimical to Bernstein; this is not, however, the sanctified, sanitized Bruckner of many post-Furtwangler interpreters, but the positive outpouring of faith from a tortured and sensitive soul. There is good precedent for finding this spirit in the Fifth above all of Mahler's symphonies: Alma Mahler reports in her memoirs that she at first rejected her husband's closing passages for his Fifth, finding them "hymnal and boring," like Bruckner; but she later came to especially love this very movement.

On sound, there's good news, too: you may have read from other *Stereophile* correspondents that recent DG CDs have begun to sound acceptable. So too with these discs; in fact, they approach the sound of Philips analog LPs of a decade ago, which is to say hardly excellent, but good enough in the case of the Fourth to convey a sense of the Concertgebouw acoustic. With Symphony 4, there is little to choose between LP and CD, the LP marginally sweeter and fuller in the midrange, the CD better etched, much more dynamic, and airier in treble. The LP of the Fifth is definitely not recommendable, side one being just too long at 37:18,

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We now have in hand five of nine issues from Bernstein's new Mahler cycle. Despite the reservations of some critics about 9 and 2, it would take a remarkable plummeting of inspiration in the remaining releases for this not to surpass Bernstein's NYPO set, which is to say, the best extant. I would certainly place this new Fifth as the best of Bernstein's new cycle, with the Fourth not far behind. —Kevin Conklin

ARVO PART: *Passio*

Michael George (bass), Jesus; John Potter (tenor), Pilate; Lynne Dawson (sop), David James (countertenor), Rogers Covey-Crump (tenor), Gordon Jones (bar), The Evangelist Chorus; Elizabeth Layton, violin; Melinda Maxwell, oboe; Elisabeth Wilson, cello; Catherine Duckett, bassoon; Christopher Bowers-Broadbent, organ; The Western Wind Chamber Choir. Paul Hillier, conductor

ECM 1370 (837 109-1, LP; -2, CD). Manfred Eicher, prod. Peter Laenger, Stephan Schellmann, engs. DDA/DDD. TT: 70:55

It is not particularly remarkable that a 20th-century composer would choose to produce a work on a religious theme: others have done so. It is both remarkable and entirely extraordinary that any composer in the present age should choose to write a St. John Passion which employs the Latin text, and which is not merely influenced by Medieval and Renaissance sources, but is almost wholly of a piece with the earlier musical traditions. This is exactly what the Estonian-born composer Arvo Part has done; even more notably, he has almost completely succeeded.

The great Victorian essayist John Ruskin said of manuscript illumination that it began to decline when it was no longer merely "writing made beautiful," when the process of decoration was no longer subordinate to the text, but instead dominated it. In a very important sense, the same can be said of sacred music. (Which may explain why *Godspell* was a popular and critical success, whereas Bernstein's *Mass* was not.) Certainly Part is aware of this; his orchestration (if we may call it such) is minimalist in the best possible sense, his melodic line is simple and emotionally expressive and never allowed to get in the way of textual clarity. His influences here are threefold: the spiritual tradition of the Orthodox Church; medieval plainchant; and the pure Renaissance polyphony of the 15th-century Italians or the English composers of the Tudor period.

I have never hidden my contempt for most of the so-called minimalist school: If the repetitive nonsense they produce is anything more than refined navel contemplation, I'll eat the

collected works of John Cage. Why, then, am I so delighted with *Passio*? First of all, because Arvo Part is an extremely melodic composer—even more so in the shorter works which Richard Lehnert was so kind as to lend me. You do not need to be *au courant* with some esoteric gabble to understand and appreciate what is being done here. You do not, in fact, need to know a thing about the composer (I didn't) when you first hear this work; you will be able simply to enjoy it as music. Secondly, I find his success in absorbing the early-music idiom to be little short of miraculous. It is not too difficult to write a reasonable pastiche of Renaissance composition—I know, I've done it—but this does not constitute real musical creation. What Part has done is to absorb his sources entirely into his musical personality, with the result that he has produced a genuine product of the medieval religious spirit. Last of all, I find the very fact of his intense religious faith to be heartening in this age when faith of any sort is nearly impossible to encounter. As an agnostic, I am comforted to know that it is still possible to believe, and to express that belief in music of profound spirituality.

A few specifics may be helpful to the reader. *Passio* does not fit exactly into any of the usual forms; it has the characteristics both of a Renaissance or later setting of the Passion, and of a medieval Passion Play. The use of instruments is (so far as I know) neither medieval nor Renaissance in style, although it may well be Part's interpretation of how instrumental accompaniment was handled in very early Western religious music. The instruments are, however, used with great effectiveness to underline and amplify the text and singing. In particular, the use of the organ pedal¹ beneath the passages sung by Jesus is appropriate and powerful. All of the instrumentalists and singers perform as though this music were in their blood: it well may be. It is now in mine.

There is one minor fly in the ointment. While there is none of the repetitiveness common to the minimalists, there is not so much melodic development here as is evident in some of Part's shorter compositions (*vide* RL, Vol.10 No.8); nevertheless, the work can be recommended even to those who have hitherto balked at anything labeled "contemporary."

I don't want to say much about sonics here. The engineers have done a fine job, in cooperation with the composer: I expect that the sound is exactly what Arvo Part wanted. The soundstage, while partly artificial, is impressive in every way (except for a bit too much

¹ I dared not say it in the body of the review—there is, like, awesome bass on this CD, man!

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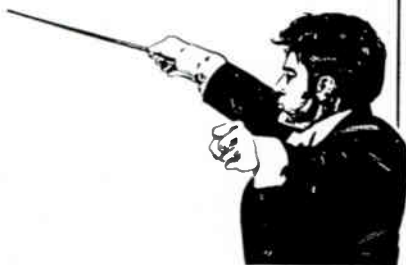
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verber on Jesus²), and the tonalities of voice and instruments are preserved splendidly. One important note: get the CD. Silence is vital to the music of Arvo Part; as quiet as the LP is, it cannot compare to the silver disc in this aspect. There seems to be a bit of compression and LF rolloff on the vinyl too. A shame, because the LP booklet has lots more nifty black and white photos (some very fine indeed)—neither booklet has any notes other than text and translations. A grand production in every sense of the word. And, oh yes: RL will get his Part discs back as soon as I have taped them. I promise.

—Les Berkley

PUCCHINI: *Manon Lescaut*

Kiri Te Kanawa, Manon; Jose Carreras, Des Grieux; Paolo Coni, Lescaut; Italo Tajo, Geronte; William Matteuzzi, Edouardo; Margarita Zimmerman, Madrigal Singer; others; Orchestra and Chorus of the Teatro Comunale di Bologna; Riccardo Chailly
London 421 426-1 (2 LPs), -2 (2 CDs). Christopher Raeburn, Chris Hazell, prods.; James Lock, Simon Eadon, engs. DDA/DDD. TT: 115:33

One always approaches a new recording of *Manon Lescaut* with glee and trepidation. As Puccini's first full-scale music drama, his first real success, it must be treated as a corner-turning work. But by the same token, it is relatively easy to please in this opera: if the singers are full-blooded, they need not be particularly subtle; they can get by with a certain melodramatic energy. But *Manon* is also a work which can disappoint totally—if it flops, it's *really* a flop, and seemingly without excuse. It has been recorded often (it is one of Callas's few not-total successes) and videotaped twice (with Te Kanawa and Scotto, both co-starring the ever-present Domingo); the first is a dud, as Dame Kiri seems not to have learned the part properly (it was her first try at it, and she was even more than normally somnambulistic), but the other is wonderful. Seeing Te Kanawa's name at the top of this roster, therefore, did not make my heart leap with joy, but happily, there are some pleasant surprises here, many moments when she actually seems to be trying to understand the character.

Her first act is wonderful—innocent, flirtatious, and vibrant. The start of the second act is introspective, as if she were actually pondering Manon's plight, and the singing itself is so beautiful that it makes one's head spin. Later, she is in love and impetuously (yes, impetuously) foolish. The last two acts (where Callas shone) are, predictably, where Dame Kiri fails. She sings without the desperation needed for the Le Havre scene, or the fear and desolation

which the New Orleans act must have. Her refusal to plunge with any depth into a role or make an unbeautiful sound, regardless of the situation, can leave a hole in a performance, and it does. I guess she will continue to infuriate and please in almost equal measure. I must admit that I was not unmoved by her Manon, and will return to it often.

Her des Grieux is the always interesting Jose Carreras. This was recorded two months before his recent bout with leukemia was diagnosed, and he sounds tired. The top of the voice in particular is a problem (Carreras has never been a high-note king, but some of the B-flats and Bs are closer to yelps here than notes); in general, he is below form. He glows, however, in some of the tender moments, and rises to heights of great passion in Act III. The quality of the voice, of course, remains handsomely burnished, but I do wish that he had decided to approach some of the music at less than mezzo-forte. Paolo Coni is the best Lescaut on discs; this is a singer to watch.

Margarita Zimmerman's voice is too dense for the second-act madrigal singer, and Italo Tajo sounds every minute his age. William Matteuzzi sings Edmundo, exhibiting a light tenor of exceptional beauty and promise; I look forward to hearing him in larger roles. Riccardo Chailly's approach is more mellow than usual—he concentrates on the young Puccini's miles of melodic invention. He does not drive the opera in either the grotesque way that Sinopoli does (on DG) or the passionate way that Serafin did (on Angel), but his reading has its own urgency nonetheless. The Bologna Chorus is a bit ragged in Act III, but the orchestra is first-rate throughout. The sound is vivid, full, and realistic—absolutely no complaints on that account. The LPs sound just as good as the CDs except for a bit of overload in Act III, and the side breaks are, for once, intelligently placed.

I'm not tossing my Callas/di Stefano discs away (the tenor is at his most ingratiating); Freni has very little to worry about, and even Caballe, though a tad matronly, is worth holding on to. But I like this performance a great deal and recommend it warmly. It isn't the most dramatic *Manon* in the catalog, but it is arguably the most beautiful.

—Robert Levine

RAMEAU: Works for Harpsichord

Albert Fuller, harpsichord
Reference Recordings RR 27 (LP), RR 27-CD (CD*). J. Tambllyn Henderson, Jr., prod.; Keith O. Johnson, eng. AAA/DDD. TTs: 57:45, 63:57*

I have to admit that I gave Reference Recordings' last Baroque release somewhat short shrift: I was disappointed enough in the performance that even KOJ's usual superb record-

² There must have been a more graceful way to say this, but I couldn't find it.

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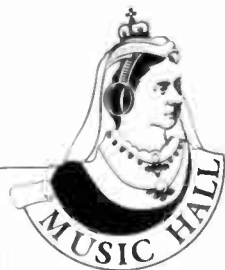
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ing was insufficient to redeem things. Here, however, Albert Fuller (who was also present the last time out) is in fine fettle, giving as good an account of these works as we could wish. Clearly he is more sympathetic to Rameau than he seemed to be toward Bach; the French emotionalism of the former is apparently more in accord with the performer's personality. I still enjoy the rendition given by young Trevor Pincock in the mid-'70s (Vanguard VSD 71271), and you will find the roots of Fuller's style on the old Bach Guild releases of Gustav Leonhardt, but the present recording stands on its own merits musically and is orders of magnitude better sonically than any of the previous versions. Fuller also sticks to real English in his liner notes, which he most emphatically did not do on the previous RR disc.

Of all the later Baroque writers for keyboard, Rameau is probably the most likely to appeal to the general listener; the emotional content of his works is closer to the Romantic spirit, and his complex figurations will satisfy those who appreciate pure virtuosity. For reasons which will become obvious in a moment, this recording carries the highest possible recommendations for audiophiles.

Out of courtesy to Reference Recordings, I wanted to compare the LP and CD versions of this release on the best possible equipment. My thanks go to Jack Rubinson of Chestnut Hill Audio for making this possible. Analog front end was the VPI TNT 1/ET II/Spectral MCR 1, feeding a Spectral DMC 10 preamp. Digital front end consisted of the digital output from a Mod Squad Prism into the Theta DS Pre (combined D/A converter and preamp). A Spectral DMA 50 power amp drove Merlin 4B+ and Vandersteen 2-C speakers. Interconnects were MIT, and speaker cable was LiveWire and Audio Research. Levels were carefully matched, and the tape-switching facilities of a Mod Squad Line Drive (*sans* volume control) were used to enable easy switching between sources.

Not to keep you in suspense any longer, the digital was the clear winner. Yes, you read that right. I am no digiphile, and I have steadfastly remained unamazed by CDs (although freely admitting some to be superb), but I heard what I heard. Two aspects of the CD sound set it apart from the LP: transients were sharper and more like those of a live harpsichord recital, and the low digital noise floor preserved more of the low-level detail of the performance (although KOJ's microphones do produce a fairly high hiss level of their own). Please spare me the usual accusations: yes, I have heard live harpsichord music, and that quite recently.

The genesis of this recording lay in a fortuitous observation by producer J. Tamblin Hen-

derson: walking around the harpsichord, he chanced to find a "sweet spot" where he heard the different registers of the instrument apparently suspended in space. It is this closeup perspective that he wished to recreate in the final recording, and he and Keith Johnson succeeded perfectly in this goal. In either format, this is one of the most remarkable harpsichord recordings I have ever heard; the digital advantage does not extend to spatial effects, where both CD and LP are equal and excellent.

I am not a hardware reviewer; nevertheless, I would like to speculate that components like the Theta DS Pre, which attack the problems of D/A conversion at the root, optimizing the conversion in the time domain, represent a significant breakthrough in digital sound. I am afraid that the "inevitable conclusion" of analog *vs* digital comparisons may have now switched round to the other side. In saying this, I have doubtless failed to endear myself to many in the high end who resolutely defend the superiority of the LP; so be it. I can only suggest that the reader employ open ears and mind in making a similar comparison, and I can only thank companies like Reference Recordings for continuing to make such comparisons possible, and allowing audiophiles freedom to choose between formats. Let me also stress as strongly as I can that recording technique is the primary determinant in sound quality: it is the care and concern for music shown by the Reference Recordings and Sheffields of the world that give us the superb records we all treasure.

—Les Berkley

RAVEL: *Daphnis et Chloé*

Eliahu Inbal, Choeur et Orchestre National de France Denon 33CO-1796 (CD only). Michel Lepage, eng.: Yoshiharu Kawaguchi, rec. dir. DDD. TT: 57:09

RAVEL: Orchestral Music

Bolero, Rapsodie espagnole, Alborada del gracioso, Menuet antique, La valse

Eliahu Inbal, Orchestre National de France Denon 33CO-1797 (CD only). Michel Lepage, eng.: Yoshiharu Kawaguchi, Guy Chesnais, rec. dirs. DDD. TT: 57:22

RAVEL: Orchestral Music

Alborada del gracioso, Rapsodie espagnole, Valses nobles et sentimentales, La valse, Bolero

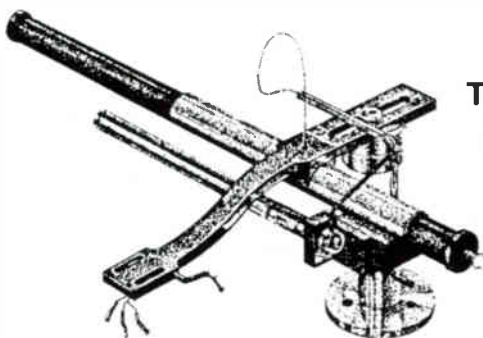
Jesus Lopez-Cobos, Cincinnati Symphony Orchestra Telarc CD-80171 (CD only). Jack Renner, eng.: James Malinsson, prod. DDD. TT: 66:42

With so many palatable recordings of Ravel's orchestral music available on vinyl and CD, record companies should tread ultra-carefully before investing in yet another contender for the Ravel buck. From the evidence presented on their two CDs, Denon didn't.

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ethos is mandatory. This is especially true of Ravel. Although conventionally classified alongside Debussy, their dissimilarities are striking and significant. Despite being influenced by his elder compatriot and the wave of Impressionism that permeated French artistic life, Ravel was closer in spirit to Romanticism. Drawing on a polychromatic palette, he created provocatively appealing sound pictures in both bold, vivid colors and the paler, ethereal pastels of Impressionism. Fleshed out with audacious harmonies, this melding of musical pigments manifests as a warm, passionate, even voluptuous character: or should! Under Eliahu Inbal's banal direction, these qualities are in notoriously short supply.

Inbal—whose conducting of the more turgid central European rhetoric of Bruckner and Mahler (on Teldec and Denon respectively) is scarcely dispassionate—seems on the wrong wavelength. Little of the requisite tension and sense of urgency can be discerned. Sober, prosaic phrasing and inflection almost neutralize the inherent sensuousness of *Alborada del gracioso* and *Rapsodie espagnole*. In fact, the entire program of both discs suffers his mistakenly cool, flat direction. Even the orchestra, a prima facie natural for this Gallic repertoire, responds with quasi-mechanical servility and little of the involved animation that makes performances acceptable.

The failure of these discs can be shared more or less equally between the conductor and the engineers; which means that the ultimate responsibility rests with the producers. The dry, veiled, sterile sonic property and ambience vitiate whatever artistic warmth Inbal intended to project. A more pernicious engineering characteristic is the musically artificial scale of dynamics. Even the most sensitive ears have difficulty in discerning music in the virtually inaudible quiet passages with the volume control in a normal-plus position. At the other end of the decibel spectrum, exaggerated, spurious, hollow-sounding, meretricious timpani explosions threaten the eardrums even with the volume in a normal-minus position. What philosophy motivated the producers (listed as recording directors) is anyone's guess—possibly a misguided marketing idea predicated on the presumed susceptibility of sound buffs. Germane examples of this injudicious dynamic scheme are *Bolero* and *La valse*. They start as the tiniest wisps of far-distant sound—nothing ethereal here, just insubstantial—and rise to strident, inartistic crescendos.

Neither of these Denon discs are in the same class as the London releases featuring Charles Dutoit and the Montreal Symphony in a similar agenda of Ravel's music. A British reviewer

described the Montreal orchestra as "by far the finest French orchestra today, whatever they think in Paris." Yes! This may be rhetorical overkill—but by a small margin. London's engineering is everything that Denon's fails to be.

The Telarc release, conclusively preferable to the Denons, is not quite as highly recommendable as the London releases. Lopez-Cobos draws refined, energized, sensitive playing from the Cincinnati Orchestra, and is decidedly more attuned to Ravel than Inbal and his French band. Even the ubiquitous *Bolero* (anyone for chestnuts?) is given invigorating treatment with tempos over a minute slower than Inbal, and a shrewdly paced rhythmic pulse rising to the inexorably theatrical (after all, this is ballet music) climax. Lopez-Cobos also highlights the terpsichorean qualities of *Alborada* and *Rapsodie espagnole* with attractive and appropriate buoyancy. *La valse*—Ravel's affectionate parody of Johann Strauss—in which excessively high spirits not infrequently vulgarize performances, is kept under discreetly expressive control. In the one piece absent from the Inbal discs, *Valse nobles et sentimentales*, the reading is rather too sober; the nobility is finely drawn, but more sentiment would have been welcome. Telarc's engineering maintains the high standards of their recent releases; i.e. with warm, natural ambience and less sonic hyperbole to detract from the musical content.

—Bernard Soll

SHOSTAKOVICH: Symphony 7

Neceme Jarvi, Scottish National Orchestra
Chandos ABRD 1312 (LP), CHAN 8623 (CD), Ralph Couzens, eng.; Brian Couzens, prod. DDA/DDD. TT: 69:06

Neceme Jarvi can always be relied upon to give a deeply personal, convincingly sincere interpretation, and so this vivid score held the promise of exciting things. I wasn't disappointed—everything is larger than life; the war-march theme of the first movement builds to a fearsome crescendo, trampling all in its pounding and insistent rhythms. (I'm a little suspicious of Jarvi's *accelerando* in this section, but I understand why he obviously felt impelled to make it.) Then there is the beautifully melancholic clarinet in the scherzo, and the wonderfully vibrant and confident strings, framing the *Adagio* in a spine-tingling show of sheer strength and conviction—the SNO has really blossomed under Jarvi's direction.


Once again, these forces have been recorded in the Caird Hall, but this time the reverberant characteristic of its acoustic has been mitigated by a closer, sharper balance than has previously been used. This has imposed a certain limitation on Jarvi's greatest dynamic requirements, the ambience becoming saturated before

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climaxes have reached their peak; this is particularly true in the first movement. I was much more impressed with the sound on LP than CD here: richer and warmer, it conveys the presence and size of the venue while still resolving detail better. The CD was characterless by comparison, its sound more open, admittedly, but hard-edged at forte and beyond.

—Barbara Jahn

Classical Collections

HINDEMITH, JANACEK, VACKAR: Music for Brass, Piano, & Percussion

John Wallace, trumpet/conductor; Radoslav Kvapil, piano; The Wallace Collection; Simon Wright, conductor

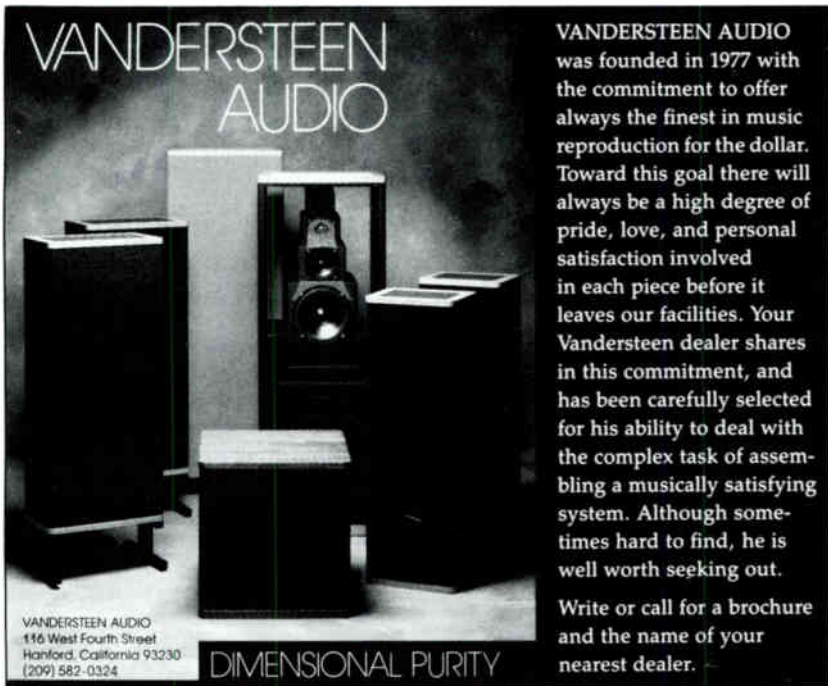
Nimbus NI 5103 (CD only). DDD. TT: 63:55

Concerto for Trumpet, Percussion, and Keyboard by Dalibor Vackar may be useful to college and conservatory trumpet players and/or percussion ensembles at the same level for recital material, but not for inclusion on a full-price CD from a label which aspires to world-class status. Likewise Wallace's performance as trumpet soloist. Wallace has been doing an excellent job as principal trumpeter with the Philharmonia since 1976, but his solo playing is far outclassed by the likes of Maurice Andre and Wynton Marsalis (not that either of them

would be likely to bother with the Vackar Concerto). Simon Wright conducts this work; Wallace conducts the other two. (For the record, the Wallace Collection is a basic woodwind/brass ensemble drawn from London's Philharmonic Orchestra by John Wallace.)

Janacek's Capriccio for Piano (left hand) and Wind Ensemble presents a different story, and is the single fully successful work on this disc. Radoslav Kvapil, a common factor to each of these three works, plays with a sure and steady left hand. This modestly scaled piece is a highly original concept, and Janacek fans are quite rightly fond of it.

Unfortunately, the *piece de resistance*, Hindemith's Concert Music for Piano, Brass, and Two Harps, is a serious disappointment. One of Hindemith's finest works, it is rarely performed, probably due to its unorthodox instrumental requirements. The performing forces are quite small by orchestral standards, but few chamber societies or ensembles can supply the nearly full-size brass section required. Professional brass ensembles which can command the budgets to mount such works are rare; harpists are expensive, the piano part is extremely difficult, and solo piano repertoire is among the most conservative in the music profession. How many aspiring or leading concert pianists are going to oil over



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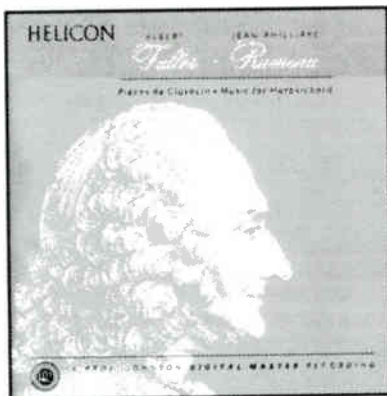
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a work so seldom commanded of them?

Since Nimbus, along with Wallace and his colleagues, saw fit to reintroduce the Hindemith to recordings, one would think they would give it their best shot. Along the way, however, something went seriously amiss. If this performance were my first hearing of the piece, I would consider most of it to be the dry, boring, formally obsessed, cerebral Hindemith some have disparaged, rather than the buoyant, lively, witty, and clever Hindemith many of us know and admire.

Hindemith recorded the work himself in 1951 with pianist Monique Haas and members of the BPO, the session licensed to the old American Decca label during the 1950s. A reissue, like anything in life, is possible, but perhaps more likely would be a reissue of Decca/London's 1981 recording by the Philip Jones Brass Ensemble with pianist Paul Crossley, Elgar Howarth conducting. I prefer the incisive drive of Hindemith's own performance, but Howarth and the PJBEB deftly trip the light impeccable, and the rightly musical, as they have in virtually all their recordings.

For Wallace and his folks, it's a matter of ponderous tempi—except for the Finale, by which time too much damage has been done. Slowing the tempi may clarify the writing and reveal details, but as these people do it, it stops the motion. What such tempi reveal of pianist Kvapil's technique would have been best kept hidden.

The recording itself is a prime example of Nimbus at its most natural—it's almost like falling asleep at a live performance. Wait for another performance of the Janacek, coupled with better performances of anything. Wait either for reissues of the Hindemith or the PJBEB performance of Concert Music, or perhaps another new recording. Sit this one out.

—Richard Schneider

Show Music

INTO THE WOODS: Original Broadway Cast

Paul Gemignani, cond.; music & lyrics by Stephen Sondheim

RCA 6796-1-RC (LP), 6797-2-RC (CD). Paul Goodman, Anthony Salvatore, engs.; Jay David Saks, prod. DDA/DDD. TT: 69:16.

The work of Stephen Sondheim seems to produce two widely diverging camps of opinion. Some hold that he is a man of genius, whose every theatrical/musical creation is brilliant, almost by definition, and that people who fail to appreciate this are simply clods. Then there are those who feel that Sondheim is a clever lyricist who cannot (or will not) compose "hummable" melodies, and who is simply too

intellectual for his own (or theatergoers') good. I'm afraid that the recording of *Into the Woods* is not going to bring about a reconciliation of these two camps.

Into the Woods is loosely based on Grimm's fairy tales, but with a marked psychoanalytic slant (Bettelheim's *The Uses of Enchantment* is an acknowledged influence). The characters go on a quest to find the things they need to live happily ever after, and the quest seems to be successful by the end of Act I. However, Act II finds them in an ever-after that is not as happy as they had wished for: Cinderella's Prince has a roving eye, and the Giant killed by Jack (of beanstalk fame) had a wife who is now on the warpath. By the end of Act II, there has been tragedy and death, and the survivors live on, somewhat sadder but much wiser.

The show is written in a manner that fully integrates the book (by James Lapine), lyrics, and music, so that there are few stand-alone songs. On first hearing, much of the music seems repetitious, and some thematic lines strongly recall parts of *Sunday in the Park with George* and "A Country House," one of the songs Sondheim wrote for the recent London revival of *Follies*. And yet . . . just as you are about to get annoyed with the almost deliberate non-tunefulness of the score, you hear a short melodic passage of striking originality and beauty, perfectly matched to words that reveal something important about the character and the situation. There are a number of such passages in the score, and, to those not expecting a song-fest in the manner of *South Pacific* or *Annie Get Your Gun*, these provide reason enough for buying the record. Also, very near the end, there are two songs ("No One is Alone," "Children Will Listen") that illuminate the central theme of the story in ways both powerful and touching. For me, it is moments like these, when Sondheim allows his intellectual mask to slip, that make me think that perhaps he is a genius, after all.

Long-time Sondheim associates Paul Gemignani (conductor) and Jonathan Tunick (orchestrator) do full justice to the score's intricacies, and the show is exceptionally well served by the cast. Bernadette Peters has been a special favorite of mine ever since her debut in *Dames at Sea*; she has always been adorable, but has now matured (in the nicest sense) into a consummate singing actress. In playing the Witch, she has done away with almost all of her trademark mannerisms, and plays a real character. There is fine work from Chip Zien as the Baker, Joanna Gleason as the Baker's Wife (a Tony-winning performance), Ben Wright as Jack, and Kim Crosby as Cinderella. In an interesting bit of casting, the same performer (Robert Westen-

berg) plays Cinderella's Prince and the Wolf that is after Little Red Riding Hood. There's a lesson here, I think . . .

Recording quality is up there with the best of the current efforts from the majors, and the LP matches the CD in having nearly 70 minutes of music. Despite the extraordinary playing time, the LP has no noticeable end-of-side distortion or bass roll-off, but (sorry, analog fans) the CD sounds just a touch more real, at least on my system.

—Robert Deutsch

Jazz

AIRTO/PURIM/FARRELL: *Three-Way Mirror*

Airto Moreira, drums, percussion, vocals; Flora Purim, vocals; Joe Farrell, flute, soprano & tenor sax; Jose Neto, guitar; Mark Egan, bass; Kei Akagi, piano; others
Reference Recordings RR-24 (LP), RR-24 CD (CD*). Keith O. Johnson, eng.; J. Tamblын Henderson, Jr., Airtio Moreira, prods. AAA/DDD. TTs: 49:28, 53:13*

Given the apparent might of the pen over the sword, it only seems fair for a reviewer to admit his or her biases from time to time. One of mine, relevant to this release, concerns *montunos*—those two-chord patterns from South America that are repeated to a point where most improvisors have long since run out of interesting ways to expound on them. Which is to say that, for this writer, a little bit of *montuno* (like a little bit of so called "minimalist" music) goes a long way.

I mention this because when I began listening to "Treme Terra" (the first track of *Three-Way Mirror*), with its insistent oscillation between C and D, I felt a state of torpor fast approaching. As the music unfolded, however, it became apparent that this is not yet another plastic attempt to fuse bongos and the blues. Rather, these efforts featuring longtime collaborators Airtio Moreira, Flora Purim, and Joe Farrell resound with authenticity and musical richness in every bar. Straight-ahead blowing (mainly by the late saxophonist-flutist Farrell) and an at times almost-palpable aura of the Brazilian rain forest, are seamlessly wedded in ways that are absorbing and emotionally telling.

Happily, the several *montunos* are heightened by Moreira's incredibly inventive and vital rhythmic overlays. Moreover, as in his "Misturada," musical segments that travel through engaging harmonic changes provide a welcome foil.

The recording sessions that resulted in this LP and CD were Farrell's last. An underrated player during his all-too-short life, some of his best work is found here. On "Comecar de Novo" (unfortunately, not included on the LP) his tenor playing is hard-edged though heart-

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felt, while "Plane to the Trane" is graced by near-atonal soprano excursions that are free yet logical, frenetic yet masterfully controlled.

"Misturada" is typical of the album's most arresting material. Its catchy main tune (based on an altered Phrygian mode) inspires some fine Farrell flute work and a five-alarm drum solo by Moreira that eloquently amalgamizes patterns from north and south of the border.

Flora Purim puts her remarkably supple voice to evocative use in "The Return" and "Sao Francisco River," the latter further enhanced by the pungent flamenco strums of acoustic guitarist Jose Neto.

"Plane to the Trane" is the most adventure-some inclusion, opening with an intriguing juxtaposition of metrically free, recitative-like material in flute, bass, and piano that languidly floats over a roaring, strict-tempo rhythmic foundation laid down by Moreira. Here, as in "The Return," pianist Kei Akagi's imaginative, elegantly swinging solos deserve mention.

Insofar as sound quality is concerned, producer and Reference Recordings founder Keith Johnson need not worry about retaining his reputation for sonic truth. His representation of instrumental and vocal timbres (the accuracy of which is very high on my personal satisfaction list when dealing with clearly understood if necessarily generalized real-life equivalents) is splendid. Soundstage, balances, and resolution are also convincing in both formats.

The differences between the all-digital CD and all-analog LP are clearly audible, however. The former is tonally brighter with a greater feeling of closeness, while the latter wins in terms of ambience, naturalness, and transparency. Which one you prefer, of course, is a matter of taste. In general, and here specifically, mine runs to the little squiggles rather than the supposedly greater accuracy of bytes and bits.

—Gordon Emerson

Rock

R.E.M.: *Green*

Warner Bros. 25795-1 (LP), -2 (CD). Scott Litt. R.E.M., prods. AAA/AAID. TT: 40:43

R.E.M. stands for Rapid Eye Movement. The group has been around for eight years, though; much more than a blink of the eye.

For the first seven years or so, R.E.M. was a small band from Athens, Georgia, with a large following all across the country but low record sales. Their music was raw but controlled, once described as a cross between The Lovin' Spoonful and The Velvet Underground. R.E.M. has been a great favorite on college radio and whatever is left of underground FM radio, the

critics, and *Rolling Stone* ("America's Best Rock & Roll Band"). The Top-10 hit "The One I Love," from *Document*, their fifth album (don't count the *Chronic Town* EP), put R.E.M. on the commercial map. It also put them in the big leagues, and they switched to a major label (A&M). Now they're a *big* band from Athens, Georgia.

Green is their first album for Warner Brothers. The album jacket is orange, probably because the label has picked "Orange Crush" to be the album's first single (and video). And *that's* probably because "Orange Crush" sounds like "The One I Love," the last album's big hit. Follow?

According to the press release, *Green* took longer to make than any previous R.E.M. album; this time, instead of coming to the sessions with finished songs, they sat around and "just made noise" until they came up with a song. They did a good job.

There are some excellent cuts on the album, some that, unlike "Orange Crush," would make great singles: "Pop Song 89," "Stand," "Get Up," and "World Leader Pretend." These are very pop-oriented; the others are raw (not quite like The Replacements, but with that Alex Chilton/Box Tops influence shining through) yet polished. No wonder R.E.M. has become one of the role models for countless garage bands across the country and around the world.

All in all, a satisfying effort, accessible to young and older alike. The notes don't say much about digital/analog recording techniques; both CD and LP were quite similar, although I'd have to give the black disk the edge for soundstaging and depth qualities.

So, J.M. Stipe, Peter Buck, Mike Mills, and Bill Berry—thanks. Keep fooling around in the studio.

—Gary S. Krakow

THE TRAVELING WILBURYS: *Volume One*
Wilbury/Warner Bros. 25796-1 (LP), -2 (CD). Otis & Nelson Wilbury, prods. AAA/AAID. TT: 36:25

Part of the charm of this album is the liner notes. You're supposed to believe them:

"The original Wilburys were a stationary people who, realizing that their civilization could not stand still for ever, began to go for short walks—not the 'traveling' as we now know it. But certainly as far as the corner and back. They must have taken to motion, in much the same way penguins were at that time taking to ledges, for the next we hear of them they were going out for the day (often taking lunch or a picnic). Later—we don't as yet know how *much* later—some intrepid Wilburys began to go away for the weekend, leaving late Friday and coming back Sunday. It was

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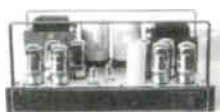
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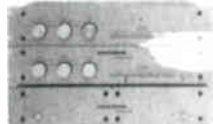


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they who evolved simple rhythmic forms to describe their adventures."

It goes on and on, but you get the idea.

There is something strange about these musicians, though. They look somewhat familiar. Lucky Wilbury looks a lot like Bob Dylan, Otis Wilbury looks a lot like Jeff Lynne, Charlie T. Jr. looks like Tom Petty, Nelson Wilbury looks like George Harrison, and Lefty Wilbury looks exactly like (the sadly deceased) Roy Orbison.

They sound like them, too! Amazing.

The album has an interesting mix of vocals and musicianship, the best cuts being Dylan's (whoops, sorry, Lucky's) "Dirty World," Lefty's "Not Alone Any More" (an incredible imitation of Roy Orbison belting out a song from 20 years ago), Nelson/George's "Last Night," and "Handle With Care," in which everyone gets to sing a line or two.

The only thing that gets in the way is Jeff Lynne's heavy-handed production. It's fine for one cut on an album (Brian Wilson's, for instance), but large production numbers do get a mite tedious on an entire album.

Sound quality is good, but not spectacular. LP and CD sounded quite similar. But the sound is not the reason for buying or passing on this one—it's the performance. The liner notes say it all: "Good listening, goodnight and Let Thy Wilbury Done." —Gary S. Krakow

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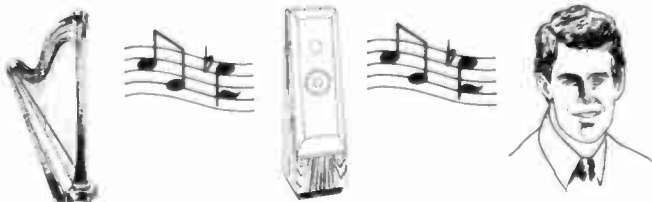
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MANUFACTURERS' COMMENTS

VTL/Belterri

Editor:

My thanks for giving us the space to try to rise above Mr. Belterri's (Mr. B.) unjust and imprudent slur on myself, Luke Manley, and VTL's good name. I confess that I was enraged (outraged, really) when informed that this letter was actually going to "run"—I overreacted, and for that I apologize. The outrage was because I would prefer to be savaged when truly at fault, wrong in *fact*.

Fact: We *do* have a written guarantee—a unique (and matchless) lifetime guarantee. *Stereophile* knows so and has a copy; JGI commented favorably on it recently!

Fact: Mr. B. *asks no remedy* because he'd been served beyond reasonable limits by our guarantee, as I will now show for your readers to judge: Nearly 14 months ago, he bought a pair of 225W monoblocks. One evinced a small, but irritating, crackle. He took them back to his dealer, who reckoned that his tech could fix it (at our cost, of course). Well, his tech couldn't, and butchered the unit to boot. The dealer left on an overseas trip and Mr. B. telephoned us—would we help? We had him ship the units at our expense. We spotted the fault (one cold joint) and discovered the butchery. Not wanting to send them back like that, we informed Mr. B.—not a quickie, but a rebuild. In the spirit of compensation and to help get his music back fast, we offered him an *immediate* exchange of a pair of \$300-more-expensive, 160W, triode-switching Reference Amplifiers at no extra charge to him, freight paid by us. He accepted with alacrity. Some two months later he phoned—requesting the 225s instead. Despondent but helpful, we agreed again, and to pay all freight again. We insisted he take the 160s to his dealer to effect the changeover. We duly sent the 225s to the dealer, but Mr. B. futzed/delayed and *he* now departed on a three-week vacation. On his return, Mr. B. phoned, threatening us; at which stage we gave up and instructed the dealer to give Mr. B. his money back. The dealer did so.

1 The full VTL lifetime warranty can be found on pages 83 and 84 of *The VTL Book*, available from VTL for \$10. However, David Manley informs me that this is now supplied, with other selected parts of the book, to customers when they purchase a VTL product. —JA

We wrote Mr. B. in full (seven months ago, copy you have) and relinquished him as a client, thereby bruising his ego, for which we apologize. For interest's sake, let us report that the dealer sold the 160s to a very satisfied customer to whom we volunteered a free full set of new tubes to make up for Mr. B.'s listening time. That, plus all the freight and attempted dealer repair, topped our cash costs out at over \$1000—a costly experience that taught us to adjust our dealer policy: we will not appoint a dealer unless he has a competent technical facility.

What happened to the replacement 225s that Mr. B. would have got? They were purchased by a prominent music reviewer who published recently.

Nou, dear readers, what do *you* think of our customer care? Do you enjoy this from your present brand of electronics? Automobile? Appliances? We *do* have the "other cheek" available to turn.

Perhaps *Stereophile* will print a copy of our lifetime guarantee? However, as Seneca wrote in his *Moral Essays*: "Whom they have injured they also hate."

David Manley

Vacuum Tube Logic of America, Inc.

See "As We See It" on p. 5 for further comments on Mr. Belterri's and Mr. Manley's letters. —JA

Klyne SK-6 preamplifier

Editor:

Thank you for the extensive review of our SK-6 stereophonic preamplifier. We are generally pleased by the many favorable comments made by the reviewer. Also, we are particularly pleased that the reviewer was able to perceive the exceptional neutrality of the SK-6, as this is one of our primary design objectives. We do wish that he had demonstrated a greater appreciation for this performance aspect, but realize that many listeners prefer a falsely dramatic or euphonic sound to a natural one. As the review is a somewhat complex mixture of technical analysis and evaluation of sonic performance applied to two (partially) different units, we hope that you will permit an unusually lengthy response in order to correct errors and eliminate confusion where it has inadvertently arisen in the review.

Regarding the first review unit supplied: We would like to begin by apologizing to both reviewer and reader alike for what has turned out to be, in retrospect, an error in judgment on our part when the first unit of SK-6 was submitted for review. At the time the request came in from *Stereophile*, we were poised to make some minor changes in the SK-6 design. While we had done preliminary testing on some of these changes, we had not had sufficient time for our customary "live with it for a while" test procedure before making a commitment to the changes and implementing them into production units. Yet, because we wanted the review sample to represent production units as closely as possible at the time of publication, and the typical delay between submitting a product for review and actual publication is always several months, it would be necessary to include the changes in the review sample if we were to meet *Stereophile's* delivery deadline. (We were told at the time of the request that there had been a cancellation in Mr. Colloms's review schedule, and that the review sample was needed in Santa Fe for shipment to England by the following Friday.) Thus the timing was such that we found ourselves "caught between the moment and the millennium," so to speak.

Alas, optimists that we are, we chose the moment; only to discover, shortly after we shipped the first unit, that some of our proposed changes were not improvements after all, but were in some measure steps backward. By then it was too late, as the test unit was already in Mr. Colloms's lab in England. At that time we notified Larry Archibald (who had contacted us for the review sample) of the problem, requested that he kindly inform Mr. Colloms that his sample was incorrectly built, that it should not be reviewed as it did not represent production units, and that we were sending a replacement unit. A second unit without phono board but having circuitry identical to all production units both past and present (except as noted below) was then dispatched. It may be of interest to note that the first unit sent to Mr. Colloms differed from the second unit *only* in the main output buffers. The buffers on the first unit had higher current capability, lower output impedance, and lower measured harmonic distortion when driving difficult loads, all of which are certainly admirable traits. Unfortunately, on extended listening the revised buffers just did not sound as good

as the original buffers we have been using all along, and still use. And while we feel that Mr. Colloms may have gotten somewhat carried away with his acerbic language, his general perception of the sonic differences between the two units in some measure concurred with ours (see also below).

There were two other minor differences (also intended changes which were not implemented) between the review samples and all production units which may be of interest to the reader. First, production units currently use Alps balance and volume pots instead of the Noble units discussed in the review. These two manufacturers' pots are basically equivalent in sonics, mechanical feel, and build quality. (We have not observed the channel-tracking error in the Alps units.) The mother board is designed to take either brand, and the choice turns on supply issues. Second, the phono board high-frequency RIAA capacitors of the review sample were of the same film type but from a different manufacturer. We had been experiencing supply problems with the original parts (these problems are now solved), and had installed alternate parts into the review sample which, at the time, seemed to be the best alternative. We now suspect that these capacitors may be responsible for the slight high-frequency softening that Mr. Colloms heard in his review sample, as we have since noticed this effect in direct comparison between the two capacitor brands.

Regarding phono noise level: A typical sample of SK-6 phono board will measure between -68 and -69dB in the high-gain setting with the standard IHF test method (referred to 0.5mV RMS input at 1kHz, "A" Weighted). (As a point of comparison, the ARC SP-11 Mk.II's published noise specification is -70dB for the same measurement technique.) We agree with Mr. Colloms that lower noise is possible and certainly desirable when it does not affect sound quality, and preamplifiers from many other manufacturers do exhibit considerably lower noise floors than does the SK-6. However, the true music lover lives not by noise alone. The sonic character of an amplifier is heavily dependent on the first stage of amplification, where the noise also originates. Herein is the designer's dilemma: Do you go for the lowest noise, or do you go for the best sound? Of course, everyone would like to have both; but we have not found this to be possible. Most manufacturers

will design for the lowest noise because it sells better. We do not. We have chosen "the road not taken" — respectfully low noise and the very best sound.

Regarding RIAA accuracy: We were puzzled by Mr. Colloms's measurements of the [MC] RIAA equalization accuracy of his sample unit. We do not know if his measurement apparatus is in error, or if his sample of the SK-6 is in error. All SK-6s are individually calibrated to ± 0.2 dB error (± 0.1 is typical) at each gain setting by feeding squarewaves through a precision inverse RIAA network. Indeed, one of the unique features of the SK-6 not pointed out by Mr. Colloms is that RIAA equalization accuracy is maintained for each of the three phono gain settings by having a separate RC network for each setting. The fact that Mr. Colloms was unable to measure better accuracy prompted us to reexamine the calibration of our production inverse-RIAA network. We found it to be within 0.1 dB of theoretical value — well within instrument measurement error. We would also like to point out that *Stereo* magazine of West Germany reviewed the SK-6 in their June '88 issue and published charts of the SK-6 RIAA equalization curve at all three gain settings. Their measurements were very nearly ruler-flat at all three settings and well within our published specifications. It is also worth noting that they chose the SK-6 preamplifier as "Hi-Fi Component of the Year" for the "High-End II" price class in their December '88 issue.

Regarding high-frequency overload: While the high-frequency overload curve of a typical SK-6 phono board does show a pattern similar to that measured by Mr. Colloms, our measurements at 20 kHz on a random sample showed results approximately 6 dB more favorable than those reported in the review. This could be due to a difference in the definition of "overload" between Mr. Colloms and us. We define incipient overload as that signal level where the harmonic distortion products change from low levels of simple second and third harmonics to higher levels of multiple higher-order harmonics. On the whole, we feel that Mr. Colloms is exaggerating the significance of this test-bench performance limitation as it pertains to actual playback of LP discs.

Of course, we would all like to see perfect performance on the test bench, but in the practical reality we cannot always achieve it. This is particularly true where cost is a limitation or

where circuit devices and configurations are chosen to yield the most neutral sound (as is the case with the SK-6). Historical analysis of playback requirements (see, for example, "Dynamic Range Requirements of Phonographic Preamplifiers," by Tomlinson Holman, *Audio*, July 1977) typically shows the overload margin requirement at 20 kHz to be some 30 dB below that required at 1 kHz. This analysis is based on both cutterhead limitations and actual playback measurements from a variety of discs. We have made our own measurements with a real-time spectrum analyzer, and are in general concurrence with these conclusions. This is not to say the SK-6 phono circuit is without limitations in this regard, but we feel that Mr. Colloms's analysis may leave some current SK-6 owners with some unwarranted concern. Furthermore, the High-Frequency Contour roll-off recommended for use with most low-output MC cartridges serves to ameliorate the additional treble lift usually found in such cartridges. Although not mentioned in the review, that is in fact the intended use of the High-Frequency Contour feature.

Regarding "op-amps": We do not like to see reviewers refer to our Music Modules as "op-amp" stages. There is a packaging similarity, but that is all. An op-amp (operational amplifier) is, in general understanding, a circuit configuration with a high input impedance and a very high fixed-gain figure of typically 100–120 dB. (120 dB is a voltage amplification factor of one million!) These devices require high external-loop feedback to bring the final gain figure in line with the actual needs of audio circuits (typically 0–30 dB) and are generally viewed by designers of high-performance audio equipment as being inappropriate for use as amplifying stages for the program signal. Our "Music Modules" are amplifier blocks of proprietary design built from hand-selected transistors, and employ high-linearity stages with local feedback and low overall loop feedback.

Regarding the sound: We were considerably disappointed with the reviewer's disproportionately large emphasis on the sonic inadequacies of the original unit, and felt that the language used was unnecessarily harsh. As we had specifically informed *Stereophile* publisher Larry Archibald early on that the first sample had been incorrectly built and was not to be reviewed and that we were sending a replacement, we feel that the reader is being ill-served

by having the sound of the second, correctly built unit briefly described in comparison with the inadequacies of the first. Furthermore, when the reviewer felt obliged to offer positive comments, these comments frequently seemed subdued and restrained, and did not support the favorable overall conclusion of the review. A more balanced and fair treatment of the relative strengths and weaknesses of just the second unit would have provided the reader with a far more useful picture of the sonic performance of the SK-6.

Regarding listening test methods: On several occasions, while describing his sonic perception of the SK-6, the reviewer made several

ence" units, without actually naming those units. We should point out that this method will never yield anything like an absolute perception of the sonic character of the test unit. A more objective sonic test method which we use compares the sound of our components to the sound of *no* component. In the case of a phono preamplifier, we take a high-quality signal (usually another preamp tape out with phono disc playback source) and pass it through a passive, precision inverse-RIAA network, then into the phono input of the test unit, then from the main outputs of the test unit into a high-level input of a third control preamp used to drive the power amplifiers in a listening system. The original reference system is simultaneously fed into an adjacent high-level input of the control preamp. The volume and balance controls of the test unit are then adjusted to give precisely matched levels of the two signals—one the original signal (the reference, *no* preamp), and the other an attenuated and re-amplified signal from the test unit. Comparing the two high-level inputs on the control preamplifier and evaluating the sonic difference can give a far more reliable perception of sonic quality of the test unit than the "sounds better or worse than my reference unit" method can yield.

To conclude, we hope that our comments have helped to put this review into better perspective, and to explain or ameliorate some (or all) of the reviewer's negative perceptions and comments. We are quite aware that the test results and opinions of high-end equipment reviewers, including those contained in this review, are always influenced, in some measure, by testing methodology, prescient expectations

of the equipment at hand, compatibility of the reviewed equipment with associated equipment in the listening system, and the personal tastes and biases regarding the relative importance of the various sonic and technical performance parameters of audio equipment. Moreover, as LA has recently, and quite candidly, admitted (see "The Final Word," December 1988), conscientious reviewers and editors at your magazine are sometimes at complete odds about what elements are important in good sound, and about what can be sacrificed in order to achieve that which is important.

As manufacturers, we only wish that audio-equipment reviewing could develop into a more objective art. We particularly wish that reviewers could demonstrate greater interest in understanding the specific design goals behind the equipment they are reviewing, and to place their analysis and comments within the context of both these goals and an overall objective testing methodology. Until this happens, we will continue to see great variability in equipment reviews, and these reviews will remain highly reviewer-specific and will thus necessarily carry an element of chance.

This said, we certainly believe that such reviews can serve to entertain and edify the reader, but maintain that purchasing decisions should be made on the basis of the reader's own equipment analysis and listening experience in consort with the aid of a respected dealer.

Stan Klyne, et al
Klyne Audio Arts, Ltd.

Arcam Delta Black Box digital processor

Editor:

We enjoyed John Atkinson's thorough evaluation of the Arcam Delta Black Box and felt especially flattered by the more expensive equipment with which he compared it. His analysis of the Arcam unit's sound seems on the mark to us. He does, however, relegate the Black Box to a life of reviving outdated players, whereas we feel that, linked to an inexpensive CD player with digital output, the Black Box makes a solid alternative to the many "modified" units available.

A few other points: He mentions Michael Martindell as the designer of the Arcam Black Box. Much of the digital side of the work, including the ASIC "Black Chip," was done by Andrew Howe. The optional Black Box opti-

cal board automatically locks onto the DAT 48kHz sampling frequency, as well as the CD 44.1kHz rate. The Black Box input polarity switch allows for hookup with any CD player's digital output. This includes the SL-D990 mentioned in the review. All Black Boxes with serial numbers greater than 321 have this switch.

We recognize that the Black Box sounds only as good as the digital signal fed to it. Our experience is that Philips-based transports have better signal integrity than inexpensive Asian-sourced transports. This does not preclude owners of other units from making significant gains in sound quality. We have even heard better sound when using the Black Box with expensive (over \$1000) players from Japan.

For a revealing A/B demonstration of the Arcam Black Box, we suggest trying the last track of the Buddy Holly *Legend* ("From the Original Master Tapes, 1956-1958") compilation (MCA MCAD-5540). Here, adding the Black Box is like stepping into the recording studio, leaving a feeling that, before, one was "outside looking in." Sometimes it takes a 30-year-old analog recording to make sense of CD replay systems.

Michael Zeugin

President, Audio Influx Corporation

Monster Cable Alpha Genesis 500 cartridge

Editor:

It's a pleasure to see the continued enthusiasm for analog record reproduction among audiophiles, and that there are significant advancements in cartridge design among many audio manufacturers to warrant a *Stereophile* cartridge survey.

We find record reproduction still very exciting and musically rewarding, especially after listening to CDs for a time. Audiophiles can expect continued efforts on our part toward the Alpha Genesis products.

Tom Norton's comments on the Alpha Genesis 500 are fair and accurate. Although the preference for a cartridge will depend much on personal tastes and associated equipment, the ability of either the Genesis 500 or 1000 to recreate "a dramatic sensation of depth, space, and atmosphere" is, we feel, without peer, and was the primary design goal of Hisayoshi Nakatsuka, noted engineer and builder of our Alpha Series.

As for the comments about the bass response

of the Genesis 500, that is a requirement of mine that is evident in all of our products. Our design goals are to achieve bass response that is not only deep, but also tight and quick, which keeps the midrange open and clear. The result is a clarity and openness that make the recreation of the performance more genuine and real.

A bit of good news for audiophiles interested in listening to the Alpha Genesis 500 is that we have lowered the price to—you guessed it, \$500 (no, we did not raise the Genesis 1000 to \$1000). Although price *vs* performance was not mentioned in this review, this certainly must rate the Genesis 500 as a "best buy" of sorts at less than half the price of some of the other cartridges in this survey.

Thanks to Tom Norton for his results and for the fine effort he made in doing the review. Cartridge reviews are difficult to do, and opinions can be as diverse as they are with cables, but hopefully not as controversial.

Noel Lee

Head Monster, Monster Cable

Audio-Technica OC-9 cartridge

Editor:

Thanks for taking the trouble to obtain an Audio-Technica OC-9 phono cartridge and for reviewing it in detail.

We are pleased with Tom Norton's generally favorable comments.

Please note that your readers will not need to resort to obtaining the cartridge overseas or to dealing with a gray-marketeer. We have made the OC-9 much easier to find.

The OC-9 is being imported by Signet direct from the factory and will be made available by Signet dealers nationwide.

The OC-9 imported by Signet, in addition to being obtained on an exclusive, direct-from-the-factory basis, will be subjected to additional quality-control procedures and will be provided with individual test data, typical of other top Signet cartridge models.

Jon R. Kelly

President, Audio-Technica US, Inc.

Angstrom Reflexion loudspeaker

Editor:

Thank you for the opportunity to reply to John Atkinson's review of our Angstrom "Reflexion" loudspeaker. While his overall assessment is,

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I think, favorable and correct, there are some points I would like to raise.

First, some minor ones. . .

The Reflexion "appears to be real oak" because it is, in fact, hand-selected and -finished real oak.

The Vifa tweeter is not at all of the "common" type. Reflexion tweeters utilize braided voice-coil leads for increased excursion capability, as well as a vented magnet assembly and subchamber for a fundamental resonance in the 800Hz region. The tweeter's ability to handle midrange signals is largely responsible for the "subtly detailed midrange" noted, as its "power to weight" ratio is far superior to any commercially viable woofer/midrange driver.

The crossover is indeed complex, as it incorporates a fourth-order Linkwitz-Riley at 2kHz and a first-order difference filter at 250Hz.

I find the 2dB difference in treble output surprising, as the units reviewed were from stock. As such, they have undergone test procedures which would have exposed this deficiency. However, without the units at hand I can't readily add further comment.

Some areas of more serious concern. . .

While I agree that the Reflexion has a "warm" tonal balance, I find the degree of Mr. Atkinson's criticisms puzzling. His finding of highly excessive low-frequency output does not jive with Mr. Sommerwerck's review or with the frequency-response graph enclosed with this letter. (Periodically, we test production samples at the Canadian National Research Council's facilities in Ottawa. This is an average example.) Reading the graph, you will note that the region below 300Hz is elevated some 1.5dB above the midband. Not 5dB. The top octave is elevated approximately 0.5dB. Mr. Atkinson's published graph shows a 4dB peak at 600Hz which is virtually nonexistent on the NRC graph.

The NRC graph also shows a broadband sensitivity in the region of 92dB at 2.83V RMS at 1 meter under anechoic conditions. An "average" listening room will tend to reinforce the anechoic output of a wide-dispersion design by approximately 3dB. This is the reason for the "listening room 95dB" specification in our brochures.

The Reflexion's "warmth," coupled with its high efficiency and power handling, help make it an ideal loudspeaker for the use for which it was intended: to be a dynamic, high-fidelity

reproducer for large listening rooms. Add its extraordinary ability to recover spatial information and its reasonable price, and the Reflexion becomes virtually unique.

Interestingly, the dynamic range of the Reflexion, one of the most striking features of this design and a major point made by Mr. Sommerwerck, is ignored altogether in Mr. Atkinson's review. The NRC graph, coupled with Mr. Sommerwerck's comments, seems to suggest that Mr. Atkinson's listening room, or the speakers' placement in that room, are the cause of both his complaint of excessive bass and the fact that his measurements indicate a sensitivity of 89dB. Being unfamiliar with any aspect of his listening environment, I do not wish to make this point too strongly.

On a more philosophical note, I would like to take exception to the practice of performing and publishing room measurements. These serve largely to confuse the public. Such curves can provide information only on the *interaction* between the loudspeaker and that particular room—and not even that with any accuracy unless it is systematic and exhaustive. My experience is that they can tell us almost nothing concrete about the speaker itself or its performance in a different room.

In closing, I would like to thank *Stereophile* and Mr. Atkinson for the time and care taken in reviewing our product and the Class D recommendation. I look forward to the next opportunity.

Martin Stec

Angstrom Associates

Black Bag loudspeaker

Editor:

Thank you for the opportunity to comment on John Atkinson's review of our speaker.

We are quite surprised, and of course somewhat disappointed, that John found little favorable to say about it, particularly in light of the numerous excellent reviews accorded this speaker by other publications. Reading his comments on the measurements carefully, however, we actually see little that is truly *bad*, either. In fact, our own findings at the National Research Council in Ottawa are almost identical, and we cannot take issue with any point John makes, except in terms of its importance or relevance. We can only conclude that, subjectively, he just didn't *like* the Black Bag, which of course is his prerogative. His comments do raise a number of questions.

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First, one must understand the purpose and design goals of this speaker. We strove to make a compact, economical, nearfield monitor, with high accuracy at the price. The LS3/5a is, without a doubt, a better speaker, and should be at nearly twice the bucks! We wanted to offer recording studios an alternative to the Yamaha NS-10, whose sound John probably despises as much as we do. To do this, we of necessity chose inexpensive drivers with a good pedigree: the Audax standard cloth-dome and 17cm woofer, treated with Plastiflex to tame its irregularities. We attempted to reduce glitches further via a third-order network, with notch filtering.

Designer: Malcolm Jones, chief engineer at KEF for its first 14 years, now consulting through his company, Falcon Acoustics. He was, interestingly, one of the original LS3/5a design team.

Box Size: a necessary compromise: to match this woofer, the box should be about twice as large, thus the bass is indeed underdamped, just like the LS3/5a, as evinced by both speakers' 3dB rise in the upper bass. As John notes, our Bags manage to avoid the corresponding -3dB dip the Rogers exhibits around 400Hz.

Position: We don't understand how moving the speakers nearer the rear wall should improve image depth; however, the intended listening position is quite close to the speaker, directly in front, and a little below the tweeter axis. In this position the response is flat, by our reckoning, $\pm 2-3$ dB from 200-20kHz.

The Drivers: Many other manufacturers use this tweeter, and the good old Spica actually uses the same woofer, too. We readily concede that the Dynaudio and the Morel are superior domes; at three times the price, you'd feel cheated if they were not. PS amps are better than NADs, too, but is it relevant? The Audax offers quite smooth response at reasonable cost. The two treble peaks John mentions are about 2dB above mean tweeter level, normally considered acceptable, and the one at 12.5kHz disappears altogether at 10 off-axis. The treble is shelved deliberately at an average of 2dB over the woofer; in our intended "pro" application, this is desirable. Maybe we should make a "domestic" version; this is a simple enough thing to alter.

Sensitivity: This is quite low, due to the complex crossover, which is why we made the nominal impedance 4 ohms, to draw more amp power. The Bags are, after all, intended for use

with a good high-current amp.

Fixing Screws: Far from unique, Robertson-head screws are common as mud in Canada. Their square-slot head is virtually unstrippable, and would be welcome relief to a world frustrated to distraction by stripped Phillips- and slot-head screws, if only said world would notice. . .

In conclusion, we would like to thank John and *Stereophile* for your comments and interest. We have two new, superior models in the works right now which will eliminate the quibbles John has with our first effort. We have the greatest respect for John as a reviewer, and hope that he will lend us his learned ears again when that time comes. **Gary Nicholson**
Avalon Audio, Ltd.

Rogers LS3/5a loudspeaker

Editor:

Time passing often gives us a new perspective on things, loudspeakers included. As JA points out, loudspeakers rarely reach 5 or 14 years of production, though most Rogers models make it to between 5 and 7 years of manufacturing before they're drastically updated. The short lifetime of products makes it hard to fix on anything constant as a reference point. So, by virtue of its longevity, the Rogers LS3/5a offers a rare opportunity for listening, testing, and, dare we say, fun.

It's refreshing to read a review of the Rogers LS3/5a that deals evenhandedly with its strengths and weaknesses. We agree with almost all of JA's concise observations on the sound of the Rogers LS3/5a, and sometimes share his feeling of "relief" when doing comparisons.

The Rogers LS3/5a has a somewhat undeserved reputation for being difficult to drive. Because it is a *voltage*-hungry speaker system, most smaller amplifiers simply run out of juice before the speaker runs out of handling capability. We recommend amplifiers in the 70-100Wpc range.

The new, updated version of the LS3/5a uses a 15-element crossover with an average 11-ohm impedance. Power handling is 30W, unclipped program, as opposed to 25W on the older version. An increase in efficiency of 1-1.5dB is another advantage of the latest Rogers LS3/5a. These changes make for a better relationship between the Rogers and the power amplifier. The updated version is more practical and versatile in application than the old. This breathes

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new life into the revered favorite.

Although the update does not change the LS3/5a's sound drastically, we've noticed a few subtle differences. Upper bass should sound improved. More detail is revealed in the mid-range. There is substantial reduction of the nasality heard in the older version. Treble is less intrusive; smoother, with less grit and hardness. The EHF (extra-high frequencies) no longer draw attention to themselves as in the older LS3/5a, which often sounded sibilant or overly breathy; overall, a more balanced speaker system.

Who knows, maybe the "old 'un" will still be giving us pleasure after 25 years. Do the Guinness people (the "World Record" books, not the beer) read *Stereophile*?

Michael Zeugin

President, Audio Influx Corporation

Taddeo Domestic Monitor One loudspeaker

Editor:

Thank you for the fine review. John Atkinson's reservations regarding our quality control and packaging are appropriate, and I would like to apologize for any inconvenience incurred. These problems have since been rectified.

In actuality, the review pair had no quality-control testing whatsoever. During a telephone conversation with JA prior to the review, I told him that we were about to bring a new version of the loudspeaker to market, and John graciously consented to our sending the new pair, instead of the pair presently on hand, for review. This new version had an upgraded crossover and a recessed tweeter. Unfortunately, we experienced a production delay on the recessed tweeter cabinets, and at the last minute installed the upgraded crossover in the otherwise identical standard cabinet. In rushing to meet the review deadline, we foolishly bypassed quality control. This was an error in judgment, rather than the fault of our quality-control technology.

Happily, the recessed tweeter cabinets are now standard and one need not tip the cabinet forward for flat response. I believe that John's having to tip the cabinets and remove the front spikes contributed to the mild colorations he experienced in the lower midrange, as there is indeed a resonance at 300Hz which the spikes minimize via floor-coupling.

The crossover point and tweeter resonance frequency as described by JA are in error. The

tweeter resonance as specified by Morel is 700Hz, and can be seen as the bump in the tweeter voltage curve. (The tweeter impedance at resonance is nine ohms, so less power goes to the tweeter than the voltage would imply.) The crossover point is approximately at the impedance peak near 2000Hz. This is well over an octave above the tweeter resonance, not below it as described. The apparent early roll-off of the woofer at 1200Hz is a result of the phase-impedance conjugate branch of the circuit.

We are both pleased and flattered that John Atkinson was so impressed by the sound of the Domestic Monitor One.

Tony Taddeo

President, Taddeo Loudspeaker Company

Parasound D/AS-1000II & HCA-800II power amps

Editor:

Thank you again for your kind Followup of the Parasound D/AS-1000II and HCA-800II. These Mk.II updates were a direct response to TJN's original reviews, and I thank *Stereophile* for its role in stimulating further refinements of these highly successful products.

The D/AS-1000II now utilizes a very high-speed FET driver stage; TJN's comment characterizes its sound much as that of a high-quality tube amplifier: "It is not hard or transistory."

It is also important for readers to note that the D/AS-1000II puts out nearly 300Wpc with 4-ohm loads, can run continuously into 2-ohm loads, and that its extended dynamic power is comfortably over 1kW. By this measure, its value compared to the more expensive reference is even more outstanding (at about one third its price!).

Since both the D/AS-1000II and HCA-800II can be operated in mono, they give users a chance to enjoy truly remarkable performance at very low cost. Since the D/AS-1000II produces an equally sweet, smooth sound at over 600W in mono (1.5kW dynamic), and the HCA-800II punches out 260W in mono, a second unit can be added later on if that higher power is required. TJN called the original D/AS-1000 almost "too powerful," which I interpret to be his astonishment, considering its low cost.

Perhaps the major contribution of this generation of Parasound electronics should be recognized for two major opportunities: a) to start a true high-end system at mid-fi cost, and b)

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to make it possible to afford more expensive, demanding loudspeakers without having to spend megabucks for amplification. Just because someone might want a very expensive pair of speakers doesn't mean he or she can afford an equally costly power amplifier and preamp. And there are virtually no other amplifiers at anywhere near the prices of these Parasound amps that can drive exotic speakers to satisfying levels without irritation or risk of self-destruction.

Thanks again to *Stereophile* for its honest and constructive comments. Your readers (and our customers) are the real beneficiaries!

Richard Schram

President, Parasound Products, Inc.

Martin-Logan Sequel loudspeaker

Editor:

I don't really have the time to fight this battle, but I think that it's important enough and someone should. . .

The Martin-Logan Sequel review in the December '88 issue *totally* missed the mark. After reading it, one is left with the opinion that the Sequel is not quite as good as the Martin-Logan Statement, or Monolith, or the B&W 801 Matrix. *No kidding*. We didn't need a contrabassoonist to tell us that.

One is left completely in the dark with regards to comparably priced speaker systems. What use is it to compare peas to watermelons? Is Lipnick so uninformed as to be oblivious to price considerations? The whole point of the Sequel is to offer a product that approaches the performance of the Monolith while costing less than the Thiel CS3.5 and about the same as the Magnepan IIIA (as well as a small host of other designs). Yet Lipnick makes *no mention of any comparable product anywhere in his entire review!* Shoddy journalism.

What exactly does the consumer with a budget of \$2300 gain from the information in Lipnick's prose? If he already had a Martin-Logan brochure, I'd say he didn't learn much of anything that could help him to decide between the various competing products. If a Martin-Logan dealer wasn't handy, which is probably the case, then he'd most likely give in to the propaganda of the local dealer and settle for something less.

I believe that the Sequel is a "breakthrough" product and I also believe Mr. Lipnick owes the

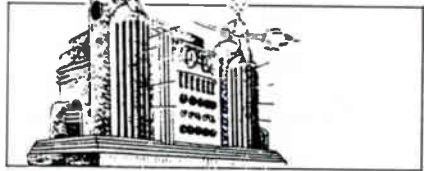
readers of *Stereophile* a new report which offers specific comparative information about the Sequel. I'd call it "the Sequel to the Sequel." His report, as it stands, is a pleasant introduction, but as any musician well knows, every composition needs to develop and contrast its themes fully, in order to achieve a satisfying conclusion.

I also believe that it is the responsibility of every reviewer to compare any product with other products in its general price category (*ie*, $\pm 10\%$). Without this practical information, reviews of under-state-of-the-art systems are worse than useless—they are counterproductive. Designers need more incentive to produce "Sequels" and less incentive to chase after "Statements."

Thanks in advance for the "sequel."

Michael Baskin

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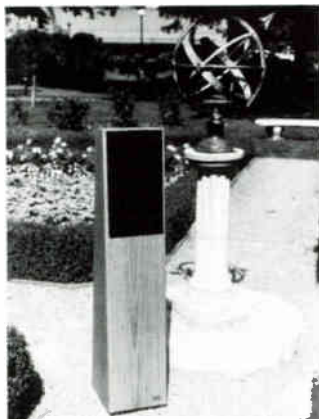
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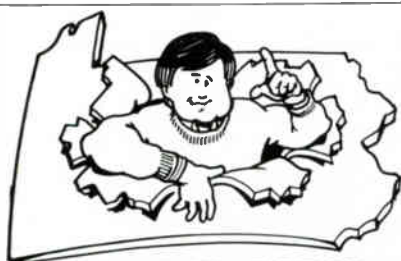
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THE FINAL WORD

Digital Power

Until now, high-end audio (*née* high fidelity) has been all about getting through to the music in its cleanest, closest-to-the-bone form. For this reason, high-end companies long ago abandoned tone controls—the switch that cuts such controls “out of circuit” is itself much too corrupting to make them acceptable—and some recent preamps have abandoned balance controls and almost all other switching in their straight-through formats. The ability to pass DC is advantageous because of the non-phase-shifted bass response it provides, but also for the coupling capacitor thereby eliminated. Many preamps have eliminated wire altogether, though a school of design is now rising which uses lots of very high-quality wire—so that circuit-board traces can be eliminated.

Although these helpful omissions usually provide subtle, rather than dramatic, improvements, a whole series of such improvements can effect a dramatic system upgrade in terms of overall transparency and closeness to the original waveforms delivered by the recording microphones. “Less is more” might have sprung from the breast of our industry.

The most-used metaphor in reviewing is the “lifting of a thousand veils”—though in fact just one veil is the pinnacle of the high-end experience. Many changes in our systems simply remove a bit of high-frequency grunge, or tighten and deepen the bottom end; widen the soundstage, or make more precise the image. These are just touch-ups, though, when compared to what happens when that unpredictable alteration, design change, new cartridge, or miraculous cable is installed—the veil is lifted and we’re one discrete, palpable step closer to our love. All the old records come out, and we sit rapt as new life is breathed.

That may be what we’ve lived for until now, but the power of digital hopes to change all that. To let a little CES cat out of the bag, my first revelation of true digital power came at a Sony press conference just nine days ago, where I heard demonstrated a “preamp” which contained surround sound, reverb, parametric equalization as customizable as you please—all in the digital domain, all for a *system* cost (in Japan) of \$2000, including CD player, ampli-

fier, and speakers. A ROM chip in the preamp would run through all the functions in a five-minute period, demonstrating the various factory-preset equalizer and reverb settings, all of which made the sound of the already poor program material vary from awful to unbearable. It was like listening through a Fun House mirror.

Then I sat down to my January *Stereophile* to discover that Bill Sommerwerck had predicted exactly this and more, with detailed, drool-provoking operating instructions. Every recording will have the most lifelike ambience, CBS HF horrors will have been tamed, every equalizing alteration performed in zero-phase-shift perfection, all rooms will have been equalized flat (except for the live sounds that take place therein, of course). Once regularized, expanded, ambiented, and compensated for, each belovedly altered performance may be committed to the perfection of DAT, or, who knows, maybe even a hard disk.

And to further arouse my fears, the trustily orthodox JA voices approval of the Matsushita automatic digital equalizer operating in real time to make everything flat.

Flat. I guess that’s one of my problems. Which of your records was created flat? You don’t know? Probably, simply, none. Are they all bad, to be discarded or reorganized? Will Junior Wells appear more live in my living room once the ambience of his recording studio has been found out, expanded upon, and the distortion in his microphone removed? Will the overload on Aretha’s tapes be removed, and I’ll suddenly be transported to the Ebenezer Baptist Church on the digital wings of an angel?

I think not. I think more veils will be there, and I’ll tire of perfected recordings, not to mention the latest, most subtly effective equalization curve that my audiophile friend in the next town over has thought up to spring on me. I fear “flat.” I go not gladly to a digitally tamed audio nursing home. I yearn for newly discovered imperfection, and perfection, in my trusty LPs.

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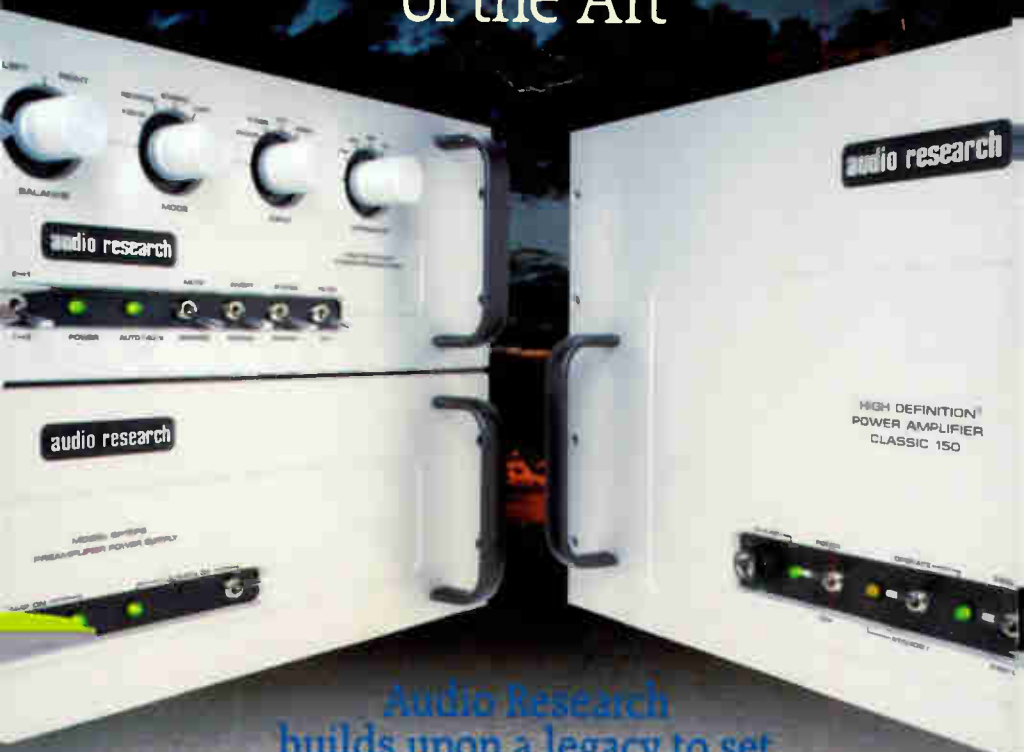
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