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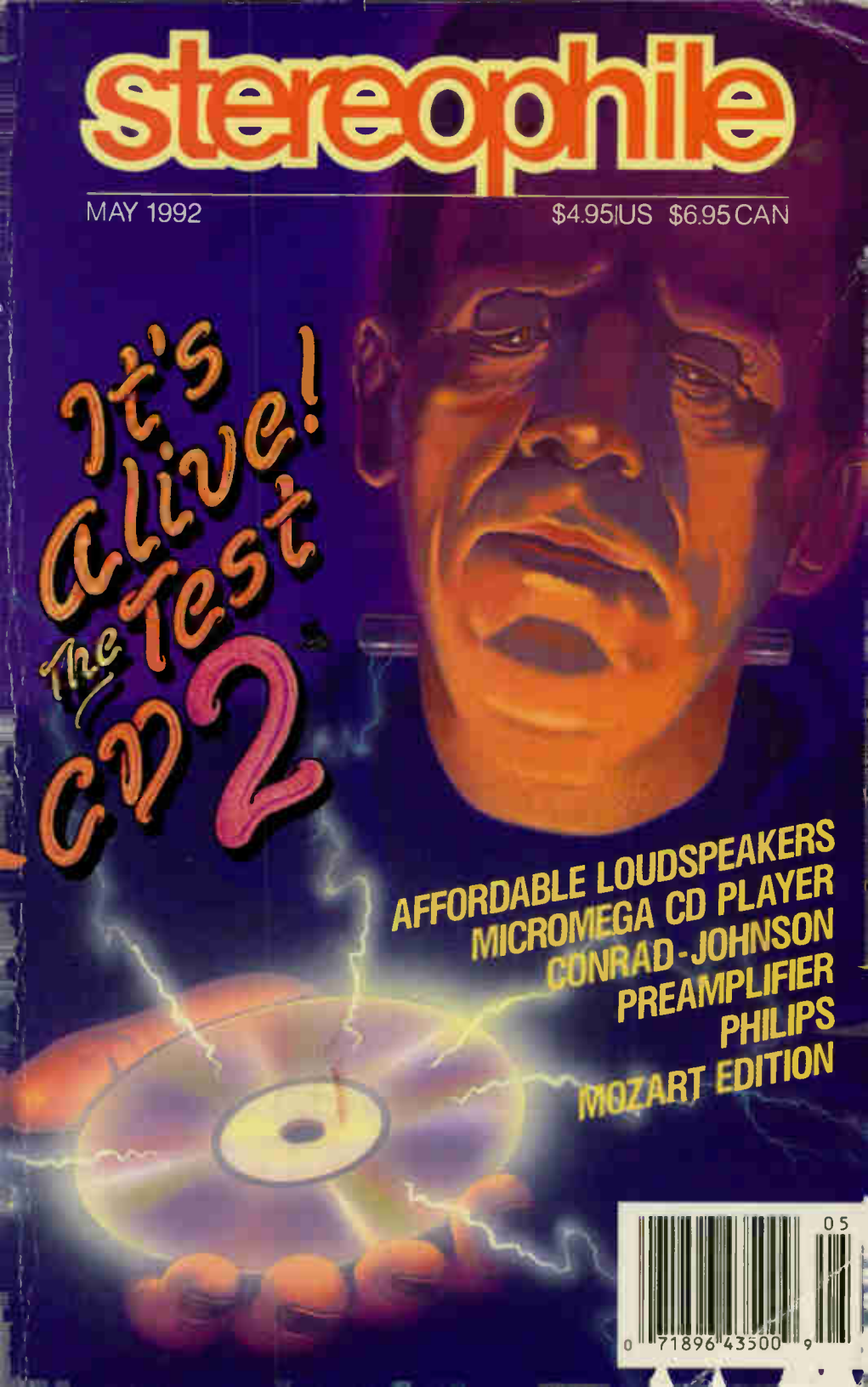

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COMING ATTRACTIONS

First, an apology. When I write "Coming Attractions," I have to use a fair dose of conjecture coupled with an appropriate amount of optimism about the next issue's content. Not everything planned always happens as expected, which sometimes leaves me with egg on my face. So it was with last month's promise that this issue would contain my review of Audio Research's Classic 120 monoblocks and Robert Harley's review of the Nakamichi 1000mb CD transport. For reasons pretty much out of my control, neither made it into print this month, for which I apologize. Both will appear in June (I hope).

Next, a couple of corrections: When we compile "Recommended Components," we ask every manufacturer/distributor to confirm the current prices of the components listed. In April, one price slipped through the net. Infinity's active Modulus subwoofer costs $2000, not $1000. We also stated that Tandberg's TD20A-SE tape recorder was no longer available. This got the attention of the new US distributors, Tandberg International, of Brewster, NY, who informed us in no uncertain terms that this excellent Norwegian open-reel deck *is* still around. **—John Atkinson**

STAFF

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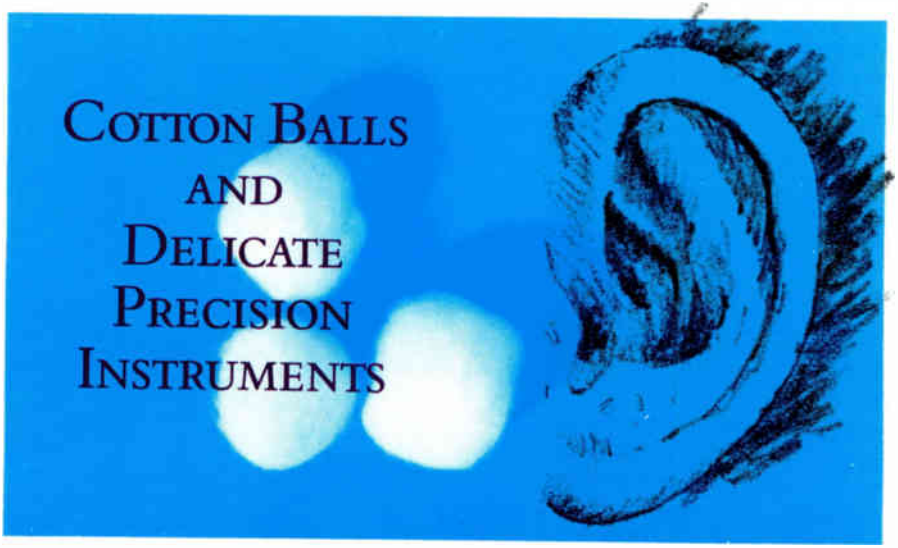
As We See It

Peter W. Mitchell



My topic today is not the hardware that we use to reproduce sound, but the delicate precision instruments we use to detect it: our ears. Our enjoyment of musical sound is important enough to justify spending thousands of dollars on recordings, electronics, loudspeakers, and concert tickets. What is it worth to preserve your hearing so that you can continue enjoying great sound 10 or 20 years from now? I've been conducting an experiment for the last 30 years, at a cost of less than a penny a day. It began when I was 17.

In the New Hampshire countryside where I grew up, the loudest noises on an average day were crickets, cows, and an occasional rifle shot. When I moved to Boston to attend college the levels of ambient noise were much higher, and I had to ride subway trains every day. The clatter and screech of steel wheels on rails, strengthened by reflections off nearby tunnel walls, was painfully loud. In self-defense I started to wear earplugs.

When I drove my old car 200 miles to New York on weekends, I found that if I wore earplugs during the four-hour drive, I arrived at my destination feeling much fresher and less fatigued. And when I skipped Art History class on Fridays to stand in line for cheap "rush" tickets to Boston Symphony concerts, I discovered that wearing my earplugs on the way to the concert made a remarkable difference to the sound I heard. Entering Symphony Hall with fresh ears, I noticed that the smallest details of musical timbre and hall ambience were wonderfully vivid. Those faint sounds were obscured if I left the earplugs at home and exposed my ears to the raucous din of city traffic, sirens, bus engines, and subway trains while traveling to the hall.

As I later learned, audiologists call this "temporary threshold shift" (TTS): the noise exposure altered my threshold of hearing.

Most people experience some TTS every day. Any exposure to loud sound will do it. The higher the spl and the longer the exposure, the greater the threshold shift. You may not be aware of it, because the perception of ordinary sounds such as conversation and TV doesn't change. A 10dB shift in your threshold of hearing won't be obvious unless you're trying to focus on faint sounds that are barely detectable—and perhaps not even then. After a night's sleep, or just a few hours in a less noisy environment, the ears recover from their stress—unless the noise was extremely loud (over 110dB). If the noise is loud enough, or your exposure long enough, the change in your hearing may become a permanent loss and may affect your perception of all sounds, not just faint ones.

After 30 years I still wear earplugs whenever I spend more than a few minutes in any environment with sustained noise levels above 80dB spl. That includes all vehicles—cars, buses, trains, and airplanes. In places like mid-Manhattan and downtown Chicago, with their constant din of sirens, taxi horns, and buses, I wear plugs even when I walk down the street.

Am I thus cut off from the world? Not at all. My regular earplugs don't obstruct sound, they just reduce its volume a little. Ordinary conversation involves sound levels around 60dB spl. Cutting back to 45 or 50dB spl doesn't make conversation any more difficult to understand, since the surrounding background noise is reduced as well. Wearing earplugs has never impaired my ability to hear normal speech. (But I sometimes have to take one out when trying to hear a faint voice on the telephone.) During the years when I worked in an office, with the constant rushing noise from airconditioning vents in the ceiling and the clacking of typewriters in the adjacent office, I used to leave cotton plugs in my ear canals all day long, removing them only at night when I got home to my quiet basement apartment. Most of my coworkers never knew I was wearing them.

My earplugs are simple wads of sterile cotton fiber. I buy a bag of 300 cotton balls at a drugstore, and each ball contains enough cotton for three or four earplugs. The cost is low enough that I can start each day with a fresh pair of plugs. Unlike most commercial earplugs, which are designed to attenuate sounds by 20 to 40dB, a small wad of cotton stuffed into the ear canal provides only about 10dB of attenuation. The absorption varies smoothly with frequency from about 5dB in the bass up to a maximum of 15dB in the highs.

With such relatively modest attenuation I can even listen to voices and music from the car radio while driving. I simply crank up the volume and treble to compensate for the plug's slight dulling of the sound, and thus achieve a satisfying ratio of desired signal to unwanted ambient noise. I suppose the resulting sound might be too loud and bright for fellow passengers in a car pool, but I usually drive alone. Of course, I could avoid this if I owned a quiet-riding Cadillac or $40,000 Lexus, but I'd rather buy a cheap car and spend my money on recordings, concert tickets, and stereo gear.

Professionals in the hearing-protection field sneer at cotton earplugs because they don't provide enough blockage to protect against dangerously loud sound. True enough. When I want to doze during a cross-country plane trip, I switch to compressible-foam earplugs made by the E-A-R division of the Cabot Safety Corp. They provide 20 to 30dB of attenuation, enough that I can't hear the stewardess asking if I want a drink. And when I take my favorite Remington rifle to the local shooting range I wear David Clarke ear defenders. They look like old-style headphones, with big cups that seal tightly around the ears and make it difficult to hear any speech at all.

Those alternatives are great for occasions when you really don't want to hear the sounds around you. Cotton plugs, on the other hand, have the uniquely valuable property of providing a useful degree of ambient noise reduction while not obstructing the normal activities of everyday life. I call them my "Dolby B" plugs: everything is slightly softer but still well within the normal range of perception. Before long, the ear/brain system adapts to living in a quieter world and you forget about them. Many's the time I've come home at the end of the day, stepped into the shower, and suddenly become aware of wads of waterlogged cotton falling out of my ears.

Is there a point to this story? We're almost there. When I began wearing earplugs, my only purpose was to reduce the annoyance

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of subway noise. But since the purpose of riding the subway to Boston University was to study science, I began to learn something about acoustics and physiology as well as astrophysics. It is well known that severe noise exposure produces not just temporary threshold shift, but permanent hearing loss. The louder the noise, the less time it takes to stress the inner ear beyond its ability to recover.

In the extreme, if you stand next to the 140dB blast of a 105mm army howitzer, a single bang may leave you with a permanent impairment. If you listen to a heavy-metal rock concert at 115dB for an hour, you'll certainly experience TTS or some ringing in your ears, but you'll probably recover the next day. But if you expose yourself to those levels for several hours every day, your loss may be severe and permanent. Some of the most famous rock musicians have learned this lesson the hard way.

This relationship is codified in OSHA regulations for factory workers. People may be exposed to an ambient noise level of 85dB spl for an 8-hour shift, but the permissible exposure time is halved for every 6dB increase in spl. This is a model of a cumulative effect: damage occurs when the product of duration and intensity exceeds a certain threshold. (For the average person the subjective intensity, or perceived "loudness," doubles with each 6dB increase in spl. But this is only an average; some people need only 3dB, while others require more than 10dB to perceive a subjective doubling.)

Since the rules were created for industrial situations, and were devised to prevent severe impairments that affect a worker's ability to understand normal speech, they don't extend below 85dB or above eight hours. But what about subtler impairments—for example, a loss of threshold sensitivity that doesn't alter your perception of speech but reduces your ability to hear low-level ambience and detail? Is there any reason to assume that the cumulative effects of noise exposure cease below 85dB? Might 16 hours of exposure at 80dB have an effect—or several years at 60dB?

I became interested in the effects of long-term noise exposure shortly after I started using earplugs. I read about remote tribes of Peruvian Indians whose high-frequency hearing was reported to be as good at age 70 as a child's. A baby's hearing may extend to nearly 25kHz, but by the time most people are old enough to vote they no longer hear tones above 18 or 20kHz. When you're thirtysomething you cease being annoyed by the 15.75kHz whistle emitted by the horizontal flyback transformer in every TV set. And now that I'm fortysomething, many of my compatriots no longer hear much above 10 or 12kHz.

Is this progressive top-end rolloff in our ears a purely age-related phenomenon? Or might it be partly a result of long-term noise exposure in an industrial society? Pre-industrial societies, like those Indians in the Peruvian Andes, were rarely exposed to noise levels above 60dB spl—and then only in brief bursts (twigs cracking, a dog's bark, occasional thunderstorms). For much of the day the average noise level in the rural countryside where I grew up (away from highways, farm tractors, and other engines) is no higher than 40dB spl.

Is anything known for certain about the effects of long-term exposure to moderate noise levels? I haven't seen any good statistics to answer this question. Much of the available data on top-octave loss is based on 20th-century European and American populations that have lived with noise-making machines all their lives. I don't know whether people in the 17th century retained their top octave better than we do today. A comparison of hearing data for modern urban *vs* rural populations probably wouldn't prove much; since 1940, most farmers have spent much of their time atop tractors, 6′ from an un-mufflered engine.

But the example of the Peruvian Indians, if true, is suggestive. So is the well-known gender difference. The numbers cited above were only for males. Adult women apparently hear high frequencies more acutely than most men do. Is this due to genetic factors? Or is it actually an effect of long-term noise exposure? On the average, men spend much more time in noisy environments than women do. Whether inborn or due to socialization, this disparity begins in childhood. Boys are more likely to engage in active games involving a lot of shouting and screaming, while girls play quietly with dolls. Adolescent boys gravitate toward guns, loud cars, and boom-boxes, while girls chat with friends. Statistically, men drive twice as many miles as women, make longer trips, and drive noisier vehicles (motorcycles, sporty cars, pickups,

Nº 30

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heavy trucks). Men become soldiers, fly airplanes, and work with loud machinery in auto repair shops and industrial factories.

Now that women are sharing more equally in these activities, will they start losing their highs at the same rate as men? Housework has also become noisy in the modern era as a result of washing machines, blenders, garbage disposals, vacuum cleaners, *et al*. Our grandmothers did their housework with less noise and a lot more effort. Nevertheless, the evidence to date indicates that the gender disparity may be getting worse rather than better. In a study reported last November at the annual meeting of the Gerontological Society of America, tests for hearing losses in adults between 30 and 80 revealed that men of every age had impairments twice as severe as women in the same age group. And at the mid-treble frequencies involved in speech perception, men's impairments became worse with age at a faster rate than women's.

I'm presenting questions and hypotheses here, not definite answers. It may be that top-octave loss is not related to long-term noise exposure. Whatever the case, top-octave roll-off probably involves a different biological mechanism than impairments caused by intense sound. It's well known that hearing losses due to extremely high sound levels occur first and most importantly at the frequencies where the ear is most sensitive, between 2 and 4kHz. This may be because the tube resonances in the ear canal cause the actual sound-pressure levels at the eardrum to be highest at those frequencies. Those, unfortunately, are also the frequencies most critically needed for speech comprehension. If you spend too much time shooting guns, driving sports cars, occupying a front-row seat at heavy-metal rock concerts, or playing oboe in a symphony orchestra while sitting directly in front of the first trumpet, the first sign of permanent damage is that you start asking everyone to repeat what they just said.

At any rate, having hypothesized at age 19 that long-term noise exposure might have some effect on hearing, I started the cotton earplug habit. By cutting my subjective noise exposure in half, I hoped to reduce or deter whatever losses might inevitably befall me.

Has the experiment succeeded? I have no rigorous scientific proof. But my high-frequency limit, which was 18kHz when I turned 20, was still at 18kHz when I was 30. At 40 I was still bothered by the TV flyback whistle that my friends had become oblivious to. I no longer hear it today (at 49), but my ears are still good to 14kHz. Clearly my top-octave loss has progressed more slowly than the statistical average for American males. In most other respects I have the usual symptoms of my age: aching joints, gray hair, and an inability to read (or see anything clearly) without eyeglasses. I've never regarded myself as a particularly "golden-eared" audio critic; perhaps my ears have just been lucky.

One more bit of evidence is suggestive. Several years ago I had an audiometric exam, which measures the threshold of hearing at various frequencies.[1] Both ears were within the "normal" range, but they were not identical. The left ear was about 10dB less sensitive than the right, particularly in the 2–4kHz region. This disparity may be only a biological accident, but I have another theory. For 20 years I habitually drove with my driver's-side window rolled down during the warmer half of the year. Even with earplugs, my left ear was exposed to substantially higher levels of noise—wind turbulence, engine noise, and the roar of trucks and buses in the next lane. Could two decades of such exposure be the reason for the permanent threshold shift in my left ear? I don't know, but after learning the result of that hearing test I changed my driving habits. Now I keep the window rolled up and use the air conditioner.

The brain automatically compensates for modest changes in threshold sensitivity. It's like the automatic-level control in a tape recorder, adjusting its "gain" to maintain a constant recording level. From the inside of my head I'm not aware of any difference between my left and right ears. And when you experience a temporary threshold shift due

1 I encourage *Stereophile* writers to have regular audiograms—I had one last summer, for example. (At age 43, my hearing appears to be better than normal between 500Hz and 2kHz, though I have some slight threshold shift—still within the region classified as "normal," however—in both ears above 4kHz.) But note that audiograms, which ouly extend up to 8kHz, do not test your upper-frequency hearing limit. You can use the test tones on our second Test CD—track 27, index points 30 to 37, which cover frequencies of 8kHz, 10kHz, 12.5kHz, 14kHz, 15kHz, 16kHz, 18kHz, and 20kHz—to check for yourself where you can no longer hear the tone. I can hear the 16kHz tone, for example, but not the ones above that. Don't play these tones too loud, however. We don't want you either to deafen yourself or to blow out your tweeters by increasing the volume of a tone above your hearing range. For more information on our new CD, see the article elsewhere in this issue. **—JA**

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to excessively loud sound, you may be unaware of it unless the shift is so great that familiar sounds (like your wife's voice) are altered. By then it may be too late; you may have stressed your inner ear beyond its ability to recover.

It may be that the capacity of the hearing system is a finite resource. If we don't use it up by constantly assaulting it with loud noise, it will still be available, unimpaired, when we want it most—for music and other important pleasures. I've become so conscious of this issue that I am even bothered by constant noises that are not loud, such as the whirring power-supply fan in the personal computer that I sit in front of all day. I've been using PCs since 1981, and the first thing I do when I buy a new one is to slow down its excessively loud fan. My next desktop PC will have no fan at all, thanks to low-power chips that were developed for laptop portables. Even if ten years of fan noise has no effect at all on the hearing system, its suppression lets me enjoy music while I work.

Whether long-term exposure to moderate noise levels has any permanent effect remains an open question. My experience doesn't prove anything, but it is sufficiently suggestive that I'm going to continue wearing earplugs just in case, whenever I'm not at home or at a concert. If you value the pleasure you experience from subtle aspects of high-end sound reproduction, you might want to do the same. For a simple test, try wearing cotton plugs for an hour or two before a critical listening session, especially while driving to a concert or audio store. Take them out when you arrive, and see whether the resulting freedom of TTS enhances your perception.

What is known beyond doubt is that prolonged exposure to high-intensity sound causes permanent hearing loss. If you're lucky, you may get a warning. A buzzing or ringing sensation in the ear, particularly one that continues for hours after the loud exposure, is a clear indication of inner-ear overload. But just as you can burn a permanent scar into your retina by staring at the sun through thin clouds, you can permanently damage your hearing with high spls and not notice anything wrong until afterward. So if you experience ringing and don't notice a permanent loss the next day, consider yourself well warned: don't expose your unreplaceable ears to such loud sounds again.

When I took my teenage nephew to a Van Halen heavy-metal rock concert a few years ago, the amplified sound was so loud—even in a relatively distant upper-balcony seat—that it was impossible to converse at all, even by yelling directly into his ear. I kept my earplugs in, except for a few brief listening tests. Even so, I noticed some TTS in my hearing after the concert. My nephew, and the other kids nearby, experienced severe TTS with ringing in the ears and some difficulty understanding conversation on the way home.

High-intensity sound is thrilling. It produces a "rush" that is fun to experience—like sex. But since you can get that orgasmic thrill from a brief burst of intense sound, is there really a significant added benefit from continued exposure lasting longer than an hour? And is it worth the risk of permanent hearing loss? Injured knees can be replaced, but you only get one pair of ears, and they have to last for the rest of your life.

High sound levels are not the exclusive property of rock music. A jazz combo can produce some pretty intense sound in a small club, even without the amplification that most groups use these days (even on brass instruments!).[2] A symphony orchestra also can produce an impressively big sound for listeners in the first 20 rows. I've measured sustained levels above 100dB spl, and transient peaks up to 115dB, during the finale of Mahler's Symphony 2 ("Resurrection"), the *Turangalîla Symphony* of Messiaen, and in a Wagner aria sung by soprano Jessye Norman. But such grandiose levels are produced in classical music for only brief periods, a few seconds or a few minutes at most. It would be too much of a strain on the musicians to continue playing *fortissimo* for longer. Acoustic music usually doesn't endanger its listeners.

In playback, it's easy to overload your ears by playing loud passages constantly. I once spent a day at CES demonstrating a new surround-sound system to visitors, using (among other things) a tape of the end of the "Resurrection." We used big speakers and a 700W amp in order to match the levels that

2 Before joining *Hi-Fi News & Record Review* in 1976 as a lowly copy editor, I worked full-time as a musician, playing bass guitar. While all my professional work was with electric ensembles, the *loudest* group I ever experienced was an all-acoustic amateur big band. Until you've sat next to the drums in front of full saxophone and brass sections, you don't know what the words "dynamic range" really mean. —JA

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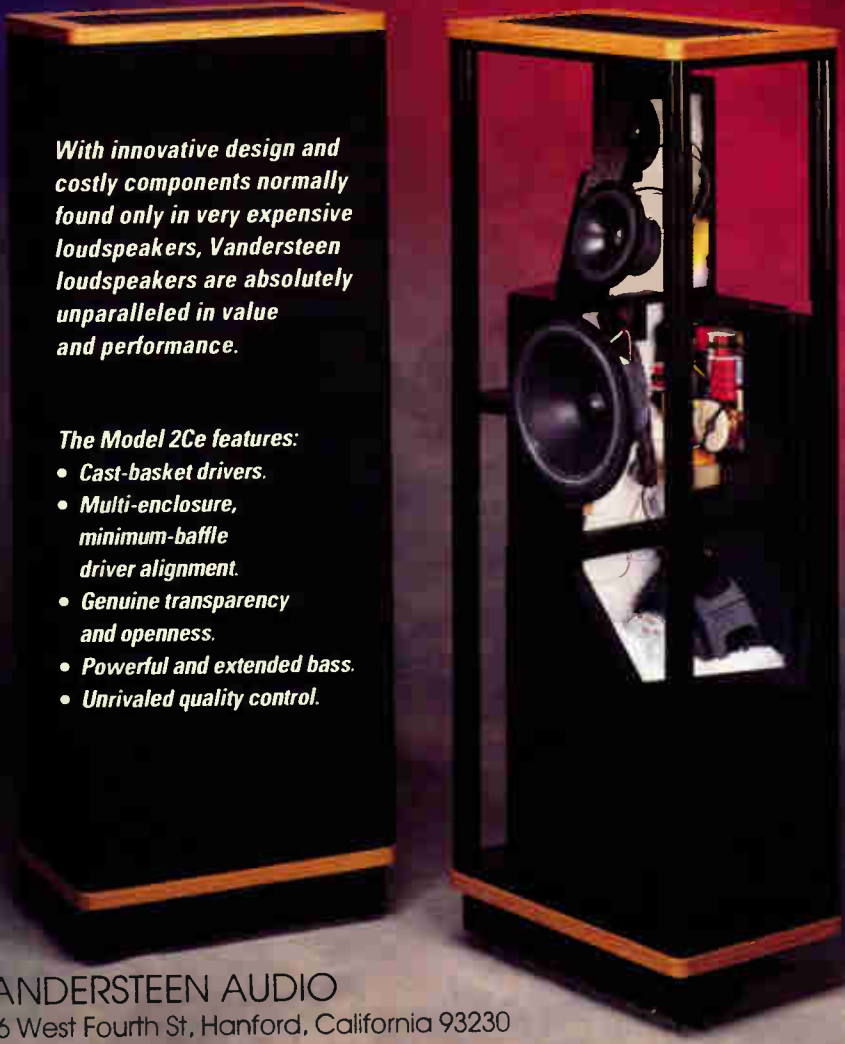

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would be heard in the best seats in the hall. At the beginning of the day it sounded wonderful, building up to a gloriously big, spacious, powerful climax. The highest levels produced some TTS, as indeed the live sound would. Normally that wouldn't matter; after hearing that sound at a concert I probably wouldn't be exposed to high spls again until the next day, perhaps not until the next week. But as the demonstrations continued I played the same tape over and over without giving my ears a chance to recover, and my TTS became progressively more severe. I inadvertently began turning the volume up in order to produce the same subjective impression. By the end of the day I was playing the system so loud that the woofer voice-coils in the surround speakers were banging against their magnets. Did you ever go into a hi-fi showroom and wonder why the salesman was playing the system so loud? He, like me, probably was temporarily deaf from hearing loud music all day.

Most living-room stereo systems can't generate +110dB sound levels without producing pretty obvious distortion. If it can, your family and neighbors may serve as effective regulators to keep you from habitually blasting your ears. But while testing car stereo components, I have measured peak spls as high as 130dB. And headphones can generate dangerous levels without even straining.

Koss, the American headphone company, has become concerned about the propensity of some listeners to fry their ears without knowing the risks. Several years ago a Koss headphone radio featured a yellow warning light that flashed whenever the sound level in the headphones exceeded 95dB. Since significant risks are presented by the combination of high-powered PA systems and thousands of people cheering in an enclosed stadium, Koss has embarked on a program of giving away compressible-foam earplugs at major rock concerts and indoor sporting events. Koss distributed 10,000 pairs of plugs at a Metallica concert last November (during which sound levels up to 116dB were measured in the audience), and 35,000 pairs at the Super Bowl in January.

High-intensity sound can be great fun in small doses. But like chocolate candy and free sex, excess may have serious and long-lasting consequences. Music offers subtle pleasures too, and it would be a shame to lose our ability to enjoy them. **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. Please note, however, that published letters are subject to editing, particularly if they address more than one topic.

COLD, DAMP, & BORED

Editor:

I'm on to you guys. I mean, what is this thing about controversies, lately? Either you have a lot of nutty readers out there, or you must be hard up for letters.

First, you had the Armor All affair.

Then, the CLOCK controversy.

Then, the COREY GREENBERG thing. And by the way, the first thing I look for when I get your magazine is CG's *oeuvre*. Even when he writes about building your own PASSIVE BUFFERED PREAMP. (Whatever the hell that is!)

Then you had these women readers complaining they were "getting no respect."

Now you've opened a new can of worms: '60s or '70s music *vs* the new stuff. A 52-year-old (his words, not mine) sharing with us HIS LIST of favorite new music and includes *Red Hot and Blue* (a terrific album). He must have missed a few decades. Another reader with a LIST implies "The Beach Boys, Bob Dylan—who?," and then gives us Union Carbide—well, maybe he's just kidding.

It's a good thing your magazine was about the only one who didn't ask who killed KENNEDY.

If these Cognac-induced ramblings sound like criticism, no, not at all! But hey, this is California. It's cold and it's damp and I'm bored.

JAMES HEPBURN
Laguna Beach, CA

COREY GREENBERG WAS RIGHT

Editor:

Corey Greenberg was right on the money in February about Steve Earle; he is real country, in the outlaw tradition of Willie, Waylon, and David Allen Coe. Garth Brooks, Clint Black, *et al*, have turned country music into homogenized pap. Their whitebread, interchangeable, *polite* music must have poor Hank spinning in his grave. Of course, this is the reason it has crossed over into popular music. It resembles most of the crap that is dominating rock today. You will never see Steve Earle at the Grammys! Who needs it? Keep telling it like it is, Corey.

HANK MOSKI
New Haven, CT

HE'S RIGHT; HE'S WRONG!

Editor:

In "As Reviewers See It" ("As We See It," December '91, Vol.14 No.12), Corey Greenberg is absolutely correct in classifying an electric guitar, played through an amp, as an *acoustic* occurrence. It's about time people understood this.

However, he is just as absolutely *incorrect* in thinking that a miked recording of an electric guitar, played through an amp, can be used to determine the musical accuracy of a playback component or system. Unless the listener (*ie*, reviewer) was present at the recording, *or* unless he has complete familiarity with, and documentation of, the exact guitar, amp, and processing devices used, *and how each and every control on all three were set*, the above assumption is absurd. Trust me on this one, guys. There are simply too many variables, each one compounding the others, to make such a claim.

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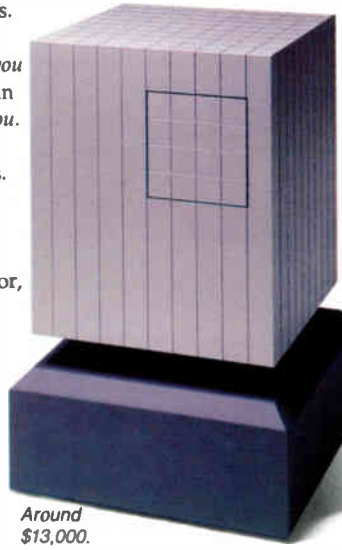

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Even the specific pickups, pots, and capacitors in every different guitar can make a big difference. If CG hears a recording of a late '63 Strat played through a specific amp and speaker, and he claims that (for example) the D/A processor being reviewed sounds too bright, he may as well be telling your readers that the earth is flat.

The *only* way such a recording can be used to judge playback accuracy is if the listener is completely familiar with the exact pieces used, and the exact setting used on each and every control on said guitar and amp.

Don't get me wrong; I don't mean to bash CG. I'm glad that someone there is finally beginning to address this whole issue.

While we're on the subject, would anyone consider trading me a Day-Sequerra FM Reference Tuner for my '56 TV-front Fender Deluxe guitar amp? (I guess I shouldn't wait by the phone, huh?)

MICHAEL KANKIEWICZ
Buffalo, NY

See the article in this issue discussing Stereophile's *second Test CD, which includes a music track recorded by CG without benefit of microphones. Can it be used to judge tonal accuracy? Only in very broad terms. But can it be used to examine such aspects of performance as image depth and soundstage palpability? Sure. Try it for yourself.* —JA

THAT TAPE TAX

Editor:

All this banter about home taping and blank tape tax (*eg, Stereophile* "Letters," December '91) has me confused. First, a couple of points that have been made before, but frame my stance: Home taping (only) when followed by distribution, is clearly theft and piracy. However, penalizing the guiltless with a blanket tax is not appropriate. Furthermore, the government should not be levying such taxes that benefit special-interest groups. What's next? A tax levied on behalf of credit-card companies to recoup losses due to fraud? Whatever happened to the simple notion of absorbing "the costs of doing business" and adjusting the prices and rates accordingly?

Now to a point that I have not seen made before. This blank-tape tax is touted as a means for record companies and artists to gain compensation for lost revenues and royalties. A general principle in civil law is that one may not seek double compensation for damages and injuries. For example, if a person is injured and collects insurance paid on behalf of the injurer, he is not permitted to seek further compensation for that particular injury or loss via lawsuit or whatever, from the culprit responsible for the loss, *even* if the insurance compensation does not completely cover the damages.

In effect, by accepting the tape tax as compensation for losses, record companies and artists should now be considered already compensated and further action should not be possible. Thus the marketing of pirated recordings may now be immune to lawsuit as long as the pirated recordings are sold on digital tape for which the tax has been paid. I don't know if this line of reasoning will ever be used in court, but in the minds of millions of citizens, home taping *and* distribution may now be ethical, since compensation has been paid, regardless of whether the compensation is "adequate" (after all, the tax rate was negotiated). Thus, I am surprised that the recording companies really think this tax, which I'm sure they view as only a small fraction of what they think they deserve, is a good idea.

DANIEL TS'O
The Rockefeller University, New York, NY

BEWILDERMENT

Editor:

After reading Robert Harley's review of the Linn CD player in January, I must admit I put down the magazine in bewilderment. In all previous reviews of CD processors, one of RH's main criteria for them to be considered good was an *accurate* soundstage. He chose his reference partially because of its huge, *accurate* soundstage.

Now we come to the Linn. Its soundstage isn't huge, but intimate and *natural*? Does this mean that the Linn is more *accurate*? But what of all those times RH described the huge soundstage of other processors as accurate *because he attended the recording*?

I hope you can see the disparity here. Soundstaging accuracy has always been a most valued aspect of any Class A component in *Stereophile* before. Therefore, which is it? Is the Linn truly accurate and Class A, and all the other "Technicolor" units Class B or below; or is the Linn really an inaccurate Class B product? Bad show, Bob!

BOB GASH
Lee's Summit, MO

I can understand how Mr. Gash may have interpreted a contradiction in my value judgments regarding soundstaging. No contradiction exists in my mind, but a clarification of the issue may resolve his bewilderment.

The problem arises from the often misunderstood word "soundstage." When I described the Linn's soundstage as "intimate" and "natural," I most certainly did not mean that the presentation was lacking depth or space. Any component that truncates reverberation decay, strips away the sense of air and bloom around instrumental outlines, or shrinks the apparent size of the recorded acoustic would not receive a high recommendation as did the Linn. Indeed, the Linn threw a superb sense of space and depth.

The Linn's presentation of soundstage differed from that of other Class A digital products in its portrayal of image size. *This is directly related to my descriptions of the Linn's "laid-back" character. At a live performance, the greater the distance from the performers, the smaller the apparent size of individual instruments (and the entire presentation). Thus the Linn's presentation of individual image size was consistent with its overall perspective.*

This is the semantic confusion: the term "soundstage" applies not only to width, depth, and space, but also to the whole picture of how images are portrayed within the presentation. When the Linn's soundstage was described as "intimate," this does not automatically mean that depth, width, and sense of space were lacking.

A hi-fi system has the impossible task of recreating the apparent size of the original event. A chamber group from Row R has an apparent width of, at most, just a few feet; an orchestra from Row C has an apparent width of perhaps 60'.[1] *Yet loudspeakers, placed a constant few feet apart, are expected to recreate this vast range. My descriptions of the Linn's soundstage that distressed Mr. Gash ("intimate" and "natural") referred to its ability to portray realistic ("natural") image sizes, particularly with chamber groups and small jazz ensembles. In fact, I specifically stated—on p.168, paragraph 2—that the Linn's soundstage was more suited to jazz quartets and chamber groups than to large-scale music. I even gave two examples of CDs that benefited from the Linn's particular presentation. I chose the word "intimate" because it conveyed both this special quality of the Linn's sonics and its unique musical characteristic: the Linn created a greater affinity between the listener and the music than occurs with most other digital products.*

Finally, there is the question of components' varying interpretations of the music. It's possible to enjoy two very different presentations without summarily rejecting one as "wrong." I enjoyed music interpreted by the Linn, even though it differed radically from, say, a Theta's interpretation, which I also enjoyed. The Linn more accurately portrayed smaller-scale music; other Class A processors excelled in presenting larger-scale music—impressions I specifically stated in the review. Part of the reviewer's charter is to accurately describe these varying interpretations so that the reader can consider products that best suit his or her individual sonic and musical tastes. Had I expressed value judgments without describing in detail what I'd heard, Mr. Gash's concerns would be valid.

I discuss the varying interpretations of digital processors—and making value judgments about them—in more detail on p.153 of Vol.14 No.5. I urged prospective buyers to listen for themselves and choose the products whose interpretations best match their individual tastes. —RH

1 At an all-Mozart concert I attended a few nights ago, I was reminded of just how small a chamber group sounds in real life. —RH

MORE ZAPPA REVIEWS?!?

Editor:

I would like to see the objectivists and subjectivists work together in an attempt to discover how components vary; we clearly have audible differences where no currently measurable differences exist, but few clues as to why. Unless we accept exotic theories such as listener-induced telekinetic quantum variations in the components, there must be macroscopic (and therefore repeatably measurable) differences, however subtle. Or, of course, those of us who hear unmeasurable differences (in cables, for example) are universally deluded.

Without meaningful measurements, we depend largely on listeners (who, due to internal biochemical changes, the events of their day, and individual tastes, experience considerable variation). Worse, equipment improvement will continue to be a tedious, expensive process of subjective trial and error. Subtle measurements, such as the D/A converter noise-floor data, may some day produce a very fruitful union of the objectivist/subjectivist dichotomy.

Corey, did you really have to *steal* your milk crates from Safeway-AppleTree? The Phar-Mor in Hancock Center has them on sale for less than three bucks! Grow up, get some class, but keep on reviewing. I think there's a talent under the bozo façade. . .

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And more Frank Zappa reviews, please!
THOMAS KAGLE
Austin, TX

TRADE IMBALANCES & HIGH-END HI-FI

Editor:

In light of the recent discussion about trade imbalance and the insult and counter-insult with Japan, I find that there is a parallel situation with regard to high-end audio. I don't mean to imply that Dan D'Agostino and Lew Johnson should go to Japan with President Bush to ask the Japanese to buy more amps, but if the American (high-end) audio industry as a whole doesn't watch it, they might be in the same predicament as the auto industry. It seemed like only a few years ago that GM (makers of Corvettes and Cadillac) were sniggering at the feeble attempts by a motorcycle manufacturer (Honda) to build cars. Seemingly overnight, they won the Formula 1 championship, and [now] sell the most compact sedans.

The whole high-end audio community, the manufacturers, and *Stereophile* should concentrate their efforts on popularizing the idea of "hi-fi" and "hi-fi" components.[2] The High End shouldn't shut itself off and become a club community of the upper-class elite. For example, *Stereophile* shouldn't have a debate about which amps could drive the Divas. It should instead ask Apogee why their woofer inverts phase and is hard to drive by an average-to-good (*ie*, affordable) amp. *Stereophile* shouldn't applaud a company that could produce a $3000 D/A converter and consider it a good deal. Good deal for whom? Those wealthy customers in Taiwan won't be affected, but what about those laid-off yuppies back home? How many of us, for instance, have the discipline to brown-bag our lunches for three years just so we can buy a decent tube preamp?

I think that the survival of the high-end industry is in the widening of the market; so that, for instance, a 200W Mark Levinson could be sold for three to four times the Adcom counterpart instead of eight times. Also, more companies need to put more effort into R&D. It is refreshing to hear that Theta could produce cheaper and better product, for instance. It's also important that the (American) industry shouldn't feel so superior that "they" can never catch up. Remember, just a few years ago we thought that the Japanese couldn't produce a decent phono cartridge. Now where are Shure and ADC in comparison?[3]
GREG JUHADI
Honolulu, HI

THE QUALITY DEFICIT

Editor:

I want to concur in LA's opinion of The Quality Deficit as expressed in "The Final Word" in February 1992. LA's insights cut right to the heart of the matter. The Japanese have worked a major industrial revolution in the electronics and automobile industries. In electronics, they did it because we let them—and perhaps even helped.

The transistor was developed by Bell Laboratories here in the US. The Japanese took the idea, developed and expanded on it, and outdid us at our own game. Then, by their predatory pricing policies, orchestrated by their government, or perhaps with its tacit approval, they made it impossible to compete with them. The result: the American transistor industry was driven to near extinction.[4]

The automobile is quite another matter. The pent-up demand for automobiles at the end of World War II allowed American automobile manufacturers to sell anything and everything they could turn out—and at a premium. They charged for the privilege of buying one of their pre-war-engineered cars! As a result, they got into bad habits. Because the consumer would accept anything, that's

2 This involves, to a large extent, "name-brand" recognition. I don't mean that we should have highway billboards showing Martin-Logan speakers, but we need to instill more awareness in the public that there are other stereo components besides Pioneer and Yamaha. A case in point: Someone decided to upgrade his B&K amps to a Krell, but the potential buyers for his (used) amp had never heard of B&K. Hence he decided to keep what he has and spend his money buying more Sony/Columbia CDs instead. Back to the trade imbalance.

3 It is a well-known fact that Rotel (UK) and Harman/Kardon (Japan-made) make excellent, affordable CD players. So it's entirely possible for companies like these to come up with near-state-of-the-art CD players for around $1000 in the near future. I wonder how the likes of Proceed, Krell, and CAL Labs meet this challenge. It sure is an enigmatic time for high-end consumers. On one hand, better and cheaper things are around the corner, but things that we love (such as Marantz and McIntosh tube amps) may fall by the wayside. Don't say I didn't warn you.

4 Actually, the notion that US companies have been driven out of the semiconductor market is a myth. While it may be true in the area of DRAM chips, I believe that US companies like Intel totally outscore the Oriental competition when it comes to advanced chips such as microprocessors. In fact, my impression is that the US specialized chip industry seems to be doing very well. —JA

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— Robert Harley
Stereophile, Vol. 14, No. 11
Nov. 1991

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— Robert Harley
Stereophile, Vol. 14, No. 11
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what the industry turned out. If they could sell it, why not? The law of supply and demand worked then, as it's working now. The only difference is that then, we liked the results. Now, we don't. But, the economic law is the same.

As LA correctly pointed out, the Japanese studied the American market and improved their product. Because of their commitment to quality, they captured the American consumer because the word got out that for a product to be made in Japan was no longer a derision, but rather an accolade. Quality shines wherever it is created or exists. It is its own attraction and justification.

Of course, the Japanese and the rest of the world buy American products. But only the best. There are a handful of names that come to mind, including the ones you mentioned in the high-end electronics business.

The laws of economics work on a world scale, and on us individually.

IRVING MARMER
Boston, MA

CANCEL MY SUBSCRIPTION!

Editor:

I was very upset after reading LA's "Final Word" column entitled "The Quality Deficit" [February 1992]. I'm sure that a good deal of my sensitivity on the issue stems from my being a *not so wealthy person* employed in the American auto industry, but I thought his comments were callous and very untimely.

I, too, was embarrassed by President Bush's recent trip to the Far East. His motivation for the trip was purely political, and it was a complete waste of taxpayers' money. Taking along a herd of Detroit executives was like sending a herd of *Stereophile* reviewers to the AES convention.

It is time to let the public know that when they make a choice to purchase any imported product over a domestic equivalent, they are hurting our country. US industries generate over ten times the tax revenues than does the sale of an import. US industries also generate supplier- and service-industry ripples throughout the country that multiply the benefit. These revenues are the basis for our roads, health care, defense, social security, etc. I'll wager that one out of every five of your subscribers are, at least somewhat, dependent on the US auto industry and its employees.

You say that the Japanese didn't have a huge head start, but they have had many advantages. The US financed their recovery after World War II. You stated that Toyota had no automatic toehold in the US; but they did, and still do, have the total support of the Japanese government on both sides of the Pacific Ocean.

Talking about the high quality of the Japanese auto is like talking about the high quality of Japanese mid-fi stereo components. They start most of the time, are inexpensive, are efficient, and require little maintenance. But would you say that a Toyota is a high-end car, especially when compared to Jaguar, Mercedes, or even Lincoln and Cadillac? That hasn't been my experience.

J. Gordon Holt would never have published anything like this article when he was in control of *Stereophile*. I hope he isn't too disappointed as he watches Larry Archibald, John Atkinson, and the rest of your crew destroy the integrity that he worked so long and hard to establish. There is a much larger issue at stake than LA's little article would imply, especially at such a time of recession. I can't believe that you actually published such drivel. Please cancel my subscription immediately, and refund any unused portion of my subscription cost.

GREG SALATIN
Anderson, IN

INACCURACIES & OVERSIMPLIFICATIONS?

Editor:

I have just finished reading LA's column in the February issue, and I am stunned at the number of inaccuracies and oversimplifications in this column. In an effort to set the record straight on the American auto industry, I offer the following arguments.

First, the reason that US cars hardly sell in Japan has more to do with Japanese industrial politics than with the inherent value of the products. In a recent *Detroit News* article (copy enclosed), L.R. Windecker discussed restrictive trade practices dating back to 1936, when the dominant auto producers in Japan were Ford and GM. The Japanese government tried to tax the US producers out of the country in 1936, then forced them out in 1939 by refusing to grant them production allocations. In 1952, when foreign producers attempted to enter the postwar Japanese market, the government refused to grant them

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market access, stating that the domestic industry had to be protected from superior imported products. Although the government relented in 1955, the Ministry of International Trade and Industry (MITI) continued to limit imports and restrict foreign production in Japan. This pattern of MITI-inspired protectionism persisted into the late 1970s, long after the Japanese industry had matured. Faced with such poor prospects in Japan, the Big Three concentrated on the American and European markets, where the legal barriers to producing and selling cars were less daunting. Had Ford and GM been allowed to resume Japanese production in 1952, they would probably be fully competitive in Japan, as they are in Europe.

Second, LA's perception of the quality difference between US and Japanese cars is at least five years out of date. Although Japanese cars enjoyed a large quality advantage over US brands in the early 1980s, domestic producers have since narrowed the gap significantly. The industry's internal quality surveys still show a slight quality gap between US vehicles and their Japanese counterparts, but they also show that American quality is improving at a faster rate. Third-party surveys such as J.D. Power's confirm the industry data. LA's statement that US cars "break much more often" is simply wrong, and betrays a lack of familiarity with today's American cars.

Finally, his suggestion that US auto executives look to high-end audio producers for tips on selling in Japan is ludicrous. Unlike US automakers, the producers of high-end audio were not forced by Japanese law to set up their own retail distribution networks, but were allowed to market their products through stores that also handled Japanese brands. There are also fewer serious Japanese competitors in high-end audio than in the automotive mass market; with few exceptions, the best Japanese equipment cannot match the sound quality of Krell, Mark Levinson, or Audio Research. If Sony (or any other Japanese supplier) were to design and build a true high-end product line at a lower price than imported equipment commands, the American High End would have a far tougher time selling in Japan.

I suggest that LA confine his future comments to audio equipment and recordings, which he discusses with wit and authority, and leave auto-industry commentary to *Car and Driver.*

DONALD P. BILGER
Livonia, MI

WELL DONE, LARRY!

Editor:

Very well done "Final Word" in February. We need this kind of thing said more often.

JOHN CHANCELLOR
New York, NY

Thank you, Mr. Chancellor, but I also appreciate the critical letters. Frankly, I'm surprised there wasn't more of an outraged response—certainly, had Stereo Sound *(Japan's leading hi-fi magazine) published an article sharply critical of the sound of Japanese electronics, there would have been a lot of angry letters in their pages.*

I am sympathetic with Mr. Salatin. If Stereophile*'s sales were sharply down due to competition from a foreign competitor, I would take none too kindly to praise of that competitor. Nevertheless, my response would be a radical attempt at improving* Stereophile*; I wouldn't shoot the messenger who brought the bad news, as Mr. Salatin has done in canceling his* Stereophile *subscription. And his tactic of comparing Japanese cars, most of which are humble Toyotas, Hondas, and Nissans, to Cadillac and Lincoln, is unworthy. Compare them with cheap GM and Chrysler cars and they come out very well. Compare Cadillac and Lincoln with Mercedes and Lexus; the American vehicles don't look that great (though I personally like Lincolns for carrying a lot of people).*

And please understand that, unlike some foolish Japanese politicians, I don't blame American workers, who are certainly not lazy. Recent articles published in The Economist *and local newspapers make it clear that Americans are the most productive workers in the world, and that Americans work quite a lot more now than they did in 1970. (The Europeans think we're nuts.) America's auto industry suffers not from lazy workers but from unimaginative, cowardly, irresponsible, and overpaid leadership.*

Mr. Bilger makes some interesting, fact-filled arguments. Although he may like better the opinions I express about recordings and audio equipment, I'm actually better qualified to comment about cars: my professional years in the auto industry number 16 (with an additional nine spent as a consumer who rents about 50 cars a year), while I've only professionally been in audio for 10. And I don't disagree that the Japanese erect formidable trade barriers to foreign competitors. Along with his letter, Mr.

Bilger enclosed an article written by L.R. Windecker that appeared in a Detroit newspaper detailing the charges Bilger makes in his letter. Certainly Japan, if it hopes to continue exporting at its current rate, will have to open its domestic markets to foreign competitors or simply face an all-out trade boycott (which, by the way, would have a disastrous effect on all other industrial economies).

Some companies overcome these trade obstacles, though. BMW and Mercedes are status symbols in Japan, and sell very well among the wealthy (they cost about twice as much there as they do here) for a simple reason: they outperform, on one level or another, most or all Japanese cars. Their standard of fit, finish, and reliability, though not up to the Japanese standard, is excellent—clearly better than their American counterparts. They even go to the trouble of manufacturing cars with right-hand drive! Have you ever noticed how many Swedish, Japanese, and British vehicles were sold in the US with right-hand drive? Virtually none, because those countries knew that, no matter how good their cars, it was unreasonable to expect foreigners to accept cars where the driver had to sit on the wrong side. Ford, GM, and Chrysler have yet to attempt this advanced strategy.[5]

And Mr. Bilger's own facts condemn his argument. He concedes that American cars deserved the reputation they acquired in the '70s and '80s for poor reliability, just as I proclaim that Japanese cars started out with a deserved poor reputation in this country. They're better than that now—why don't the Japanese realize that and buy our cars? But you can't make headway in a foreign market selling more expensive cars which only come close to *the native product in terms of reliability. No, you have to beat out the native product, and not for just a year or two—you have to do it for long enough that the general market perception changes. (Three-and-a-half years after* Stereophile *became a monthly publication in mid-1987, people would ask us* just when *we were going monthly!)*

But American cars, though much better than they used to be, still don't match most Japanese cars for reliability. According to a newspaper article I read recently, the best American cars used to have twice as many reliability problems as the average Japanese car; now the margin has been narrowed to 30%. THIRTY PERCENT IS STILL A LOT! When the Americans are plus or minus 5% for several years in a row, they'll have something to crow about to not only the Japanese, but to Americans as well. (I still feel that American car companies are only dragged kicking and screaming into making reliable, high-quality cars, just as they were reluctant to raise fuel efficiency, provide practical, space-efficient vehicles, or install airbags—but I guess we can expect the leopard only to mind its manners, not change its spots.)

Which all distracts from my original argument: George Bush should have sent the US car manufacturers to visit high-end audio companies to find out why the former have such a hard time selling cars to both Americans and foreigners. Mr. Bilger says it best: "If Sony. . . were to design and build a true high-end product line at a lower price than imported equipment commands, the American High End would have a far tougher time selling in Japan." That's a tactic US auto manufacturers haven't tried, because they've lost any vision of excellence. They're unwilling to try to make something to a world-class standard, apparently because the risk would be too great.

America's industries became world-famous because of people willing to "bet the company" on a new and excellent product. High-end audio companies do this routinely and, because the products they make are truly great, they're successful at it.

—LA

5 Apparently the only American automobile manufacturer to export right-hand drive cars to Japan is Honda! Accord Coupes for the Japanese market are made in their Marysville, Ohio plant. **—JA**

THE ETERNAL SUBJECT

Editor:

I was greatly interested in Larry Archibald's ideas expressed in "The Final Word" in the February issue of *Stereophile*. A letter I had written to our local newspaper states similar views about the pharmaceutical industry, but with a different slant (see enclosed reprint).

Now a comment on double-blind testing, discussed by Robert Harley in two excellent articles in the January issue. Double-blind testing is, of course, not new to the pharmaceutical industry. In most clinical drug-testing programs a control group is dosed with a placebo, a harmless coated sugar pill, in order to account for psychosomatic effects. The identity of the placebo group or the drug group is not known to either the clinical practitioner or the patient until the code is broken.

There seems to be a difference in the way double-blind testing is done on audio equipment and on pharmaceuticals. With drugs, a patient receives *either* the placebo or the active agent, never both. In audio, I have the impression that if, say, $10/foot speaker cable

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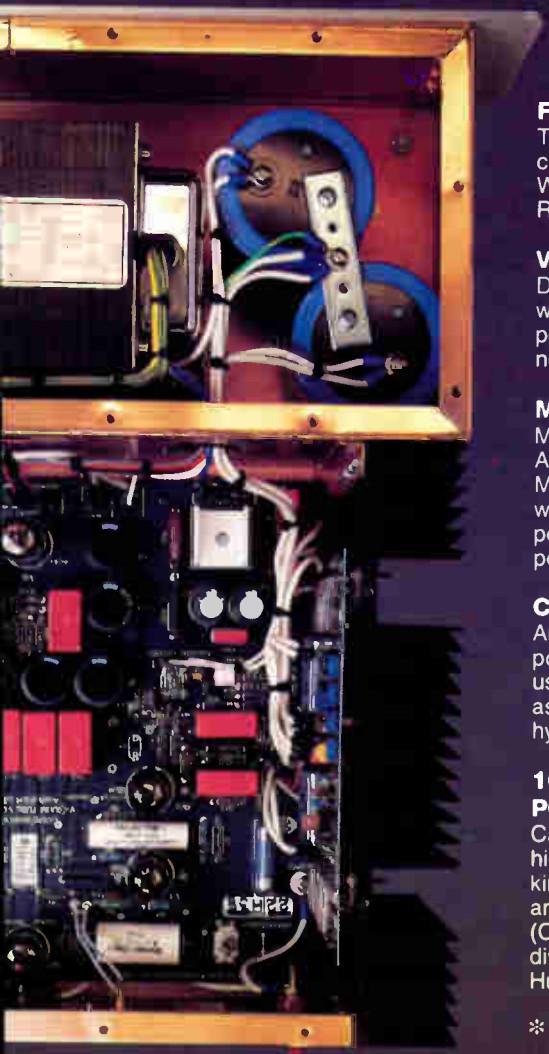

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is being compared to lamp cord, that the source is alternately switched through one and then the other. All of the testers then try to detect a difference or state a preference.

This switching introduces a distraction that could cloud the results, particularly if the test involves musical enjoyment. A better way might be to split the testers into two groups and allow one group to audition *only* the premium cable and the other only the lamp cord (neither group knowing to which they are listening). The detailed subjective sonic impressions of the two groups can then be compared to detect the relative quality of the two cables. LEONARD M. WEINSTOCK
Hilton Head Island, SC

OBJECTIVITY & REFERENCES

Editor:

The question of whether there can be objectivity in listening to and evaluating hi-fi components and whether such objectivity is even desirable is an interesting topic. I would venture to say that such objectivity is really just an "idea" when it comes to the actual listening experience.

The part that memory plays in listening to a musical event is at the crux of this matter. Each of us has stored in the brain and organism (it is now known that even individual cells have a kind of memory) all of our past experiences, including those of a musical nature; just how this occurs is of great interest to people of many scientific fields, but that it does occur appears incontrovertible. I would not be able to recognize the sound of a guitar, for instance, if I had never before heard what a guitar—any guitar—sounded like. And those of us somewhat familiar with the sounds of live musical instruments have probably heard many different kinds of particular instruments, so that many differing sounds might all be recognized as guitar sounds, though the guitars themselves would each have unique sonic characteristics. Of course, what I am saying could be taken to extremes, and we would begin to get an idea of how complex the system of memory and sensation is.

Let's say that I have never heard the sound of live music, other than heavy metal music played in large auditoriums at extremely loud levels. If I go looking for a hi-fi system, taking along copies of Megadeath, or whatever, then I will most likely find most "accurate" the system that most closely reproduces the live concert sound I am used to. How an unamplified acoustic guitar might sound over such a system—well, I don't know. But can one deny the point of reference which such a person brings to his or her musical experience, and say that such a system is "inaccurate"? It may very accurately reproduce the sound of distorted electronic instruments at 100dB, as this relates to the live concert event.

So we need to know where we are coming from when talking about this stuff, and this will be based on our points of reference which are a part of memory. Our experiences differ in both large and subtle ways. Many people might agree upon the type of instruments being heard over a hi-fi system (again, this points to some shared past experience with that particular sound), but each person's experience would have most likely been somewhat different, and so judgments made on more subtle levels may begin to show up those differing experiences. Where, please tell me, is the objectivity in all of this? And is objectivity even to be of concern? Or would it be more helpful, truthful, and accurate to become familiar with our prejudices, thereby gaining a better understanding of where we are coming from? This is revealed when we begin to share our personal tastes, preferences, musical experiences, etc.

What is wrong with this approach? Music is an experience involving the senses, with some aspects of memory actively engaged, and has emotional outcomes as well; not only is it not possible to become 'scopes and metered instruments, but why would we want to?

Another approach which may simplify the whole thing is to find components through which one truly enjoys listening to one's favorite recordings, and leave the technobabble, picky critiques, endless evaluations, and determinations of accuracy to those paid to do this sort of thing! There is a Wife Acceptance Factor; what about a Sheer Enjoyment Factor? STEW GLICK
Springwater, NY

THE UNSCIENTIFIC "OBJECTIVIST"

Editor:

While Robert Harley's "The Listeners' Manifesto" (Vol.15 No.1, January 1992, p.111) has added valuable food for thought, he has also

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added unnecessary complication and confusion to the issue by connecting the "objectivist" approach to supposedly flawed assumptions of Western science. Instead, the flaws in the so-called objectivist approach are actually quite simplistic, having nothing to do with the limitations of science. The objectivist approach fails on its own terms, because it is not scientific at all. The alternative to the "objectivist" approach should not be called a "subjectivist" approach, because, as Mr. Harley correctly points out, the alternative should combine objective measurement with subjective listening. Unlike the objectivist position, this alternative can reflect a correct understanding of scientific methodology.

The objectivist's position (or positions) actually rests on several unverified assumptions. One of these assumptions is that presently existing instrumental testing methods using a) presently existing test equipment and b) the presently used battery of tests, can fully determine which audio components sound best and which sound alike. The scientific approach is to accept this position as a hypothesis to be tested. To the extent any of the so-called objectivists accept this position *a priori*, it is they who are being unscientific. But their failure to use scientific methodology goes beyond this.

Listening tests are the only way to test the objectivist's hypothesis, for only by listening can one tell which components sound alike and which do not. Many objectivists realize that listening tests are required, so they rely upon certain limited types of "blind" listening tests. These testing methods are questionable not because they are "blind," but because they are too limited. In addition, they raise yet another question: Who determines what sounds better in listening tests? The majority? The statistical average of a randomly selected group? The experienced reviewer? The novice? The objectivists typically add another *a priori* assumption: If most people cannot hear it, or if I cannot hear it, no one else can. This assumption is not derived from objective evidence; on the contrary, it is very unscientific and even absurd.

In fact, we already know, and can determine as objectively as it is possible to determine, that the ability to hear varies from one person to another. Let's take the simple example of ear tests performed in the office of a typical qualified specialist, whom I'll call the "ear doctor." The ear doctor knows that some people can hear a 20kHz sinewave, and some cannot. (I know that I used to, but cannot now.) Similarly, some people can hear a particular level of sound at 1kHz, some cannot. Note that the ear doctor can only determine whether a patient can hear a particular sound through a listening test and by asking the patient what he or she can hear. No qualified ear doctor will tell a patient, "Everyone else can hear this, so you must be hearing it regardless of what you say." Conversely, no such doctor could reasonably tell a patient, "You did not hear that. No one else I've tested has."

Obviously, the ear doctor's reliance on listening tests does not make that approach unscientific. The listening test just happens to be a necessary part of the inquiry.

The point here is not that an ear doctor can determine who can best test audio equipment, but that to test a person's hearing, we have to conduct a listening test and ask the person what can and cannot be heard. In this respect, we cannot do better than the ear doctor. Just as an ear doctor would be committing malpractice if he or she told you what you hear based on what others have heard, the "objectivist" cannot say that "no audible differences exist" if anyone claims to hear them.

Let's look at this from another angle. Suppose a wind quintet plays before a small audience, and only one person in the audience is an experienced musician. If the oboe is slightly out of tune, it is not unlikely that only the musician would know it. Some of the audience may vaguely sense that something is not quite right, but most of them would probably not know that the oboe was slightly out of tune, and many might hear nothing wrong at all. If the same piece were repeated with the oboe in tune, it is quite likely that only the musician could positively state that he or she could hear the difference between the in-tune performance and the slightly out-of-tune performance. If someone took a poll and found that only the musician noticed the difference, are we to conclude that the musician was wrong? Obviously not.

Listening to audio equipment is not unlike this. Many types of distortion consist of "out-of-tune" noises added to the music. This is not to say that musicians would

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generally make good reviewers of audio equipment, but the more attuned you are to how the music should sound (whether you are a musician or an acute listener), the more likely you are to notice a difference if a small amount of "out-of-tune" distortion is added. [*See my Test CD article elsewhere in this issue. —Ed.*]

The problem with listening tests to "prove" that audible differences can or cannot be heard lies in devising an adequate test, just as the problem in testing any hypothesis is finding an adequate experiment to test it. The "objectivist" is theoretically correct in insisting that such listening tests should ideally be "blind." The "objectivist" is wrong, however, to assume that any particular "blind" test is adequate. Typically, "blind" testing to date has involved listening under the confining conditions Mr. Harley has described. The underlying assumption in these blind tests is that significant differences among audio components can be heard quickly under pressure. The flaw is not in the concept of blind testing, which is theoretically correct, but in its limited application.

For example, every experienced reviewer and listener knows the phenomenon of "listener fatigue." Sometimes it takes several hours, or even days and weeks, of listening to notice that more irritations are present in reproduced sound when listening to one component than are present when listening to another that is comparable. In view of this, one "blind" test to consider performing would be to give an experienced equipment reviewer two different amplifiers contained in identical boxes. The reviewer could compare them in the environment he or she is used to and listen to them over a long period of time. Then the boxes could be passed on to another reviewer. I have no doubt that such long-term blind testing would produce consistency among many trained reviewers, not only in showing that Amplifier A is different from Amplifier B, but also in defining exactly what those differences consist of. Pure subjectivity is transcended by agreement among subjects about what they have heard.

In principle, obtaining agreement among subjects is no different from objectivists agreeing that the needle on the dial or the digital display "says" a certain thing. You have to *look* at the meter to read it. Is what I see the same as what someone else will see? Objectivity, even in science, is based upon agreement among perceiving subjects. Doesn't the objectivist claim boil down to a dubious assertion that what one "sees" is more objective than what one hears?

Thus, the flaws in the objectivist positions are really quite simple. The objectivists fail to be objective in acknowledging and testing their own assumptions. Mr. Harley's article misses the point when he criticizes the objectivists' "false premise" that "audio equipment quality can be reduced to a series of mathematical representations" (p.119). First, scientific inquiry does not necessarily require mathematical representations or models, but it does seek models which have some predictive value, and mathematical models are paradigm examples of such models. But more importantly, just as with the objectivist positions, we must ask Mr. Harley, "How do you know that no such mathematical representations can be discovered?"

The answer is that you cannot know (unless you have access to a deity no one else can access) without experimentation and testing, and even then you can only prove the affirmative (that there are such a set of mathematical representations and here they are), not the negative (that no such representations can be discovered). It is one thing to say that no currently known mathematical models can correlate to audio equipment quality (which is probably true); quite another to say that no mathematical models can ever be found to correlate to listening ability. The latter is unprovable. If you use such an unprovable assertion as your thesis, you have entered the realm of religion, not of scientific inquiry. In this respect, Mr. Harley's anti-mathematical position and the "objectivist" position rest on similar ethereal and *a priori* ground.

An important goal of component testing (and here, Mr. Harley seems to agree) should be to discover the instrument tests which best correlate to the listening experience of those who can hear a difference. It is a goal, in keeping with scientific inquiry, of finding the means of predicting results using the appropriate models. This goal appears to be in keeping with the usual approach of *Stereophile*'s best equipment reviews, which: 1) combine extensive listening tests with instrument tests, 2) attempt to correlate the two, 3) determine when the two do not seem to

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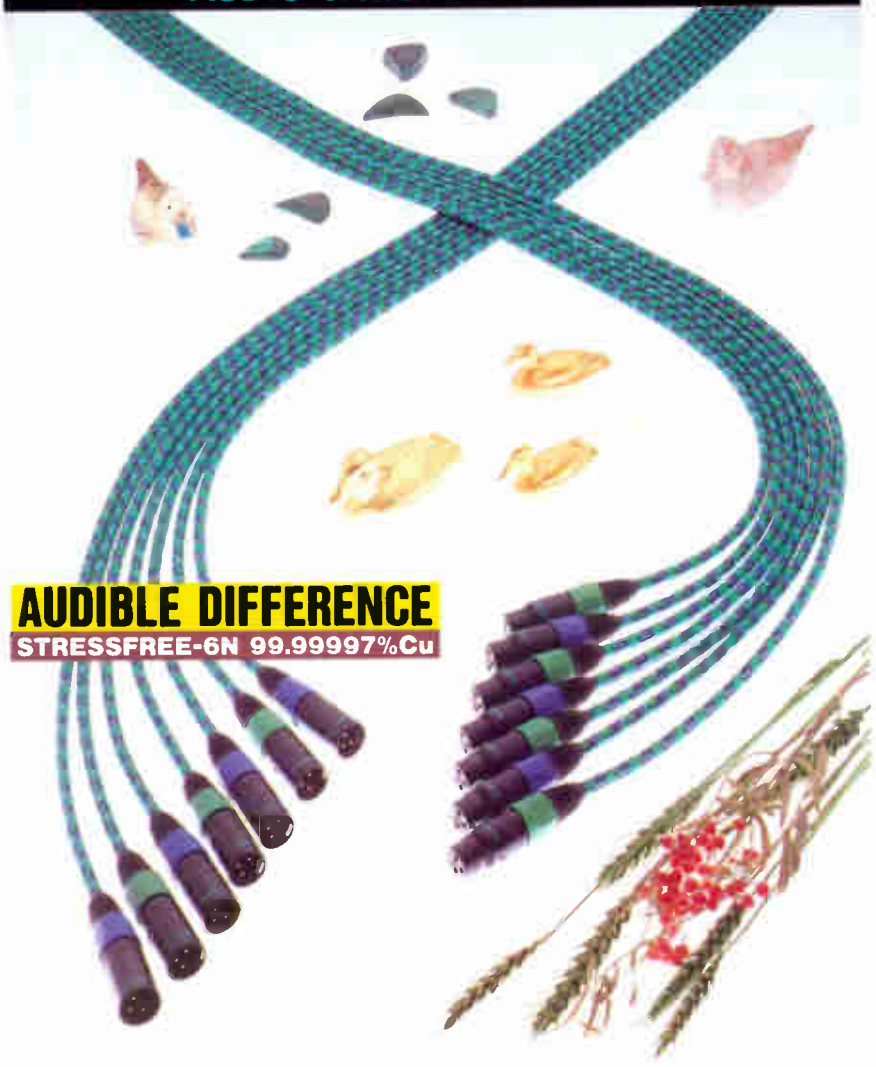

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correlate, and 4) incorporate new means of instrument testing when they become available and appear promising. Eventually it may be possible to find the battery of instrumental tests which can predict which audio components will sound best to acute listeners. But acute listeners, of necessity, remain the final judges.

JOHN L. HODGE
Montpelier, VT

OBFUSCATION?

Editor:

Robert Harley's 26-page obfuscation entitled "The Listeners' Manifesto" [January 1992, Vol.15 No.1] best illustrates the subjectivists' refusal to address the objectivists' singular objection: the lack of blindness in listening evaluations.

Rather than addressing this primary issue, Harley concocts a litany of straw-man arguments: blast instantaneous A/B comparisons, chuck the purportedly "nontransparent" ABX comparator, eschew a "test" protocol. Instead, sit in the comfort of your home before your own familiar playback system, request a friend to install the audio component in question, use whatever cabling the manufacturer suggests, relax, take a deep breath, and give a good long listen for as long as you want—months, even. Just one simple request: do not peek at the identity of the component.

Is that too much to ask? With respect to the *sound* of the component, that knowledge is totally irrelevant. Yet everyone—subjectivists and objectivists alike—would have to admit that at the very least, the possibility exists, even among self-styled "professional listeners," that such information could influence and thereby compromise the listening evaluation. And that possibility—some would say probability (but let us not argue the point)—is intolerable to a credible attempt to be objective in one's subjective assessment of an audio component's sonic performance.

Until the audiophile community adopts a listening protocol which is as blind as Harley's arguments to the contrary, its judgments can only be regarded as suspect.

JEFF SILBERMAN (an objective subjectivist)
Baltimore, MD

NOT AFRAID OF A BLIND TEST

Editor:

I have been following the double-blind testing discussion for some time, and I don't understand what *Stereophile* is so afraid of. I think all of your metaphorical tales of the mysteries of perception and criticisms of ABX are a crock (you supply the contents).

How can you expect to be treated with any credibility when you shy away from the only type of testing that removes preconception and bias? Please don't give me any more of the peering-through-an-eyepiece or taking-a-test-makes-me-nervous stuff. I am not asking for any specific methodology like ABX; just make the test double-blind. Put two amps behind a screen and have someone else do the switching. If you can't reliably identify a Krell from a Peavey without reading the nameplate, how can you ethically recommend one over the other?

You don't need to convince me that a Levinson amp sounds better than a "Best Buy" Pioneer receiver, but the vast majority of electronic design engineers do need convincing. Until credible evidence appears to the contrary, these engineers will continue putting electrolytic capacitors in the signal path and using cheap op-amps.

Worthless dealer demonstrations and five-digit prices make accurate reviews essential to high-end consumers, but how can we weigh your opinions? What protection do we have that you have not been fooled? I have some expensive choices to make (like a new DAC), and your dragging your feet against double-blind testing isn't helping at all. Pick some "easy" comparisons, be scrupulously double-blind, and put an end to this "they all sound alike" mentality.

MICHAEL G. FORD
Orange, CA

THEY KNOW WHAT'S BEST FOR US

Editor:

I am a pre-Electrical Engineering student here in Houston, and I just want to make clear the fact that not all engineers are in agreement with the AES and its sympathizers. Even though all differences in audio equipment cannot be shown on testing devices, most engineers realize that differences do exist.

This high-end bashing by some members of the AES therefore has me worried, to say the least. I am afraid someday the government will tell me that I cannot buy the $6000 Tookie-Flookie speaker cables because they

are too expensive and have been proven by laboratory equipment to sound no better than less expensive cables. It does not matter that I am an adult, free to make my own decisions, that I can hear a difference, and that I know what I like.

With all that has been said, the government might come in and say, "Certain people have found that this or that piece of audio equipment does not represent a good value to the general public. Because of this we will now take away your right to buy certain things. We do this because there are those who know what is best for *you!!*"

Not to get overly dramatic, but I think that George Orwell might get a little upset if he was here to see what is happening. If the general public wants to buy this or that cable, either on the advice of a dealer, manufacturer, or just because they want to say they have the most expensive cables available, they certainly have that right. If a customer decides to buy a cable without listening to it first to see if it meets his or her own needs—then it is that individual's choice to do so. These people should not be misled by unscrupulous people, but they should also be able to buy what they want.

And just what are we supposed to use as speaker cable—lamp cord?!? Yeah, right!!!

CLAYTON DREYER
Houston, TX

COMIC-BOOK REPORTING

Editor:

In the January 1992 *Stereophile*, Robert Harley's coverage of the October AES Convention continued the great comic-book reporting that we have all come to love. *Stereophile* has become a wonderful amalgam of *Amazing Comics* and *The National Enquirer.*

Naturally, I disagree with most of JA's and Mr. Harley's coverage, but more specifically I have a question about something he said on p.73. Here, Mr. Harley stated that my research ("Can You Trust Your Ears?," AES Preprint 3177), which shows that listeners are strongly biased to report differences when given two identical alternatives, ". . .calls into question the whole idea of A/B testing. Because music has meaning, we interpret it differently each time we hear it. These different interpretations often obscure the audible effect one is trying to disprove exists." (*sic*)

However, Mr. Harley uses music to evaluate the Linn Karik in the same issue. He notes that the Linn made him "*feel* right," which was "the *most* valid indicator of quality, and that listening for specific performance attributes could preclude this perception of *feeling* right." How, then, could he be sure that it wasn't just his differing interpretations of the music each time he heard it that made him feel right?

Doesn't the use of music call into question your evaluation techniques as well? Even if you overlearn the program material, as Bob Stuart recommends (a good idea), how can you be sure that the musical meaning won't influence your evaluation? Stuart suggests that other research disciplines use stimulus without content. So how about it: test signals, anyone?

Oh, and yes, Mr. Harley "put the Linn CD player up against some very tough competition" in his single-presentation evaluations, and later "compared" it "with other digital processors," apparently using music for both kinds of evaluation. Aren't these just A/B tests? The single-presentation method has more time and distance between comparisons, but they both include some kind of A/B comparison.

"Can You Trust Your Ears?" helps quantify listener bias to help consumers make better buying decisions. It validated phenomena that appeared in earlier research: *eg*, even trained, experienced listeners are biased to report differences when presented with two identical alternatives. Therefore, bias control is perhaps the most important element of good-quality subjective evaluation.

Aren't ABX and other double-blind evaluations just A/B comparisons, similar to your own, with listener bias control added? Blind comparisons aren't limited to length or fast switching intervals. In fact, one of the first amplifier tests published took three weeks to get 40 trials. Others have employed single listeners with personal reference systems. Another very early one used highly regarded listeners. In these tests, when bias controls are added to comparative evaluations of electronic signal-path devices, the results rather strongly support the conclusion that important sonic differences between such devices are nil. *Stereophile*'s own tests verify this conclusion. In other words, when bias controls have been added, your own research fails to support your hypotheses.

You might be well advised to start listening closely to the content of your own research. It shows that amplifiers and CD tweaks stop making you feel better when the faceplates and name tags are removed. It's not bad news. . . be thankful N-Ray machines are no longer available.

In summary, if "Can You Trust Your Ears?" calls A/B testing into question, it calls *Stereophile* equipment evaluations into question as well. I read your magazine with interest and good cheer. Many of my friends, including me, want to think of *Stereophile* as the product of well-meaning, if occasionally misguided, good guys in white hats.

J. Gordon Holt, in my opinion, fit that description, but your defensively biased reporting, persistent rejection of contradictory information (for example, any experiment with null results, even your own), endorsement of ill-fated ideas like Armor All, and mean-spirited comments, make it increasingly hard to judge the color of your headgear. Chill out, Dude.

Tom Nousaine
Cary, IL

STEPS TOWARD THE TRUTH?

Editor:

I attended the loudspeaker cable workshop at the 1991 AES Convention in New York and came away with impressions very different from Robert Harley's ("Audio McCarthyism," January 1992).

The loudspeaker cable workshop was an opportunity to discuss and learn about the technical, aesthetic, and legal issues surrounding this controversial subject. It was not intended to be the last word on the subject, and it certainly was not the conspiratorial persecution of "critical listeners" suggested by Harley. As I recall, Dan Dugan introduced the workshop as a mere step toward the truth. Never did I hear him claim to know the "truth" regarding cables, and certainly no one suggested that "if they couldn't measure it, it didn't exist." That statement is more often used to discredit anyone looking for physical or statistical evidence.

The listening test was probably meaningless, but who suggested it was conclusive? It was done in a practical manner which, if far from perfect, at least was honest and out in the open. For some, perhaps it was a waste of time. I enjoyed the chance to hear 30-gauge wire and learn about ABX testing.

The presentations given by the panelists were well within their respective areas of expertise. I found each to be intelligent and articulate. The psychologist and lawyer were especially interesting because they were *not* audio experts and had no vested interest. Psychologist Jeff Corey spoke authoritatively (and accurately) on scientific methods, but pointedly did not draw conclusions about speaker cables.

Lawyer Wilfredo Lopez presented consumer protection law in general terms. Most of what I heard sounded like good, common sense. Deceptive advertising is illegal, and making unsubstantiated claims is deceptive. As I understand it, one cannot imply improved performance by simply using technical-sounding jargon. Technical terms must have widely accepted definitions. The Department of Consumer Affairs is asking for a well-reasoned consensus from the audio community on the merits of sophisticated cable designs, and practical terms which describe those merits. Harley's Doomsday account of future legal consequences is a frightening piece of disinformation.

Surely, the majority of AES members recognize the limitations of conventional signal measurements and are open-minded about advancements in cable design. However, the combination of extraordinarily expensive cables and questionable performance gains has roused a few skeptics—hardly the "Spanish Inquisition." Harley needs to show some token concern for innocent, even ignorant consumers. . . His characterization of this workshop as "Audio McCarthyism" and his portrayal of Dan Dugan as another Senator McCarthy is a pathetic attempt to bury the debate.

Walter Sargent
Stony Brook, NY
Electrical Engineer, member AES, IEEE

Stereophile *has stated many times in print its opposition to double-blind, forced-choice, ABX-presentation test procedures. There is hardly the space here to go over the complete reasons for that opposition yet again, so I refer readers to RH's article in Vol.15 No.1, p.111, for a full exposition, as well as back to Mr. Hodge's letter above. Briefly, however, despite Mr. Nousaine's statement that blind tests strongly suggest that "important sonic differences. . . are nil," having myself taken part in many such tests, I am*

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forced to the conclusion that obtaining null results must have been the motive behind the methodology adopted in nearly all of them.

In addition, as in any scientific procedure, the variables in a listening test must be reduced to just the one to be examined by that test. The methodology advocated by Mr. Nousaine, Mr. Ford, Mr. Silberman, et al, *actually introduces additional variables that no one has yet explained to our satisfaction why they don't matter. Sighted listening as practiced by* Stereophile, *of course, has a different set of drawbacks, but at least they are ones that are predictable and can be allowed for by a professional reviewer/experienced listener, as suggested by Mr. Hodge. (*Pace, *Mr. Silberman—but why do you use the words "self-styled professional" for people who* do *earn their livings from what they do?)*

Let me illustrate this first point with an example taken from my own experience. Amid Mr. Nousaine's obfuscatory bluster over A/B tests—RH was talking about blind *A/B tests as practiced by Mr. Nousaine, of course (see my comments in footnote 5 in this month's panel speaker test)—he asks the question—sarcastically, I assume—"Test tones, anyone?" Having taken part in blind tests that have used both tones and music, I have found tones (which, by definition, do not change with time) to be a far more efficacious signal source for use in blind tests than music. Using an asymmetrical signal in a blind test with the ABX box back in 1983, for example, I consistently scored 10 out of 10 detecting acoustic polarity reversal, whereas with music, my identification dropped to that due to chance. Does this mean that absolute polarity is inaudible with music? Not necessarily. An equally strong hypothesis can be made that the changing nature of music with time renders the ABX methodology invalid. The fact that the overall published evidence supports the audibility of absolute polarity with music suggests that this latter hypothesis is the correct one. Doesn't it?*

There is also a practical point here. If our review methodology is suspect, then our descriptions of sound quality and our value judgments will also be suspect, bearing only a random relationship with reality. We publish as much supporting information in our reviews as possible to enable readers to test our conclusions for themselves. Every month, therefore, we give everyone the opportunity to test the validity of what we say. If our descriptions and conclusions are at variance with reality, then Stereophile *has no business staying in business. If they do correspond with reality, then all the philosophical objections don't amount to a hill of beans.*

Regarding the "Wire Roast" at the October 1991 AES Convention, I am happy that, despite the protestations of Mr. Sargent and Mr. Nousaine, Robert Harley accurately reported what occurred and was said. As the entire affair was taped, I encourage readers to order the cassette tape of the session, therefore. (Contact Conference Copy, Inc., 2222 Avenue X, Brooklyn, NY 11235. Charge-card orders are accepted at (718) 934-2890.) And to those who seem to feel that Stereophile *somehow "has it in" for the Audio Engineering Society, please note that both Bob Harley and I have been AES members for many years and regularly attend the conventions. We have nothing but respect for the vast majority of the Society's membership; the criticisms made in our January issue referred to the actions and statements of a tiny number of very vocal activists with an agenda I feel to be at odds with the interests of the Society as a whole.*

Please do not assume that our opposition to the legal implications of Dan Dugan's "Wire Roast" means that we support deceptive advertising or the dissemination of disinformation, as has been suggested elsewhere. The fact is, however, that, as Mr. Dreyer points out, for a small number of politically motivated militants to try to set up an a priori *set of restrictions on trade is Orwellian in its implications. Under current law, if a consumer feels that he or she has been duped, remedies are easily available. (I also note with interest that retailers often allow customers to try before they buy with cable.) To set up an alternate system where only those manufacturers who can satisfy criteria established by a small faction of the AES membership are allowed to bring their products to market is an antidemocratic action that I cannot support. As Michael T. Saliba said in our March "Letters" column, "We must be constantly wary of those who purport to use government to promote the well-being of those other than themselves."*

And who, if not the consumer, is qualified to decide what is and what is not deceptive advertising? One of the advertisements used by Mr. Dugan in his presentation to illustrate his thesis (all taken from Stereophile, *Mr. Sargent) concerned the Duotech Cable Enhancer, which "burns in" cables and interconnects. I must admit to having been skeptical myself when I first learned of this product. Yet if you turn to this issue's "Industry Update," you will read that Peter Mitchell (one of* Stereophile's *more conservative writers) took part in a listening test where he concluded that this box* does *appear to make a difference to the sounds of cables! There is nothing as strange or as complex as reality, something that the Nousaines and Dugans of this world would apparently like not to be true. —JA*

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US: Peter W. Mitchell

As expected, the bill to impose a "royalty" tax on all digital recorders and tapes encountered only slight opposition during its scheduled mid-February hearing before the House Copyright Subcommittee. Favorable testimony came from representatives of the electronics industry (Radio Shack), the recording industry (Capitol/EMI), musicians (Barry Manilow), and songwriters. Legal experts recommended some minor changes in legal language and royalty accounting procedures.

The only real opposition at the hearing came from Wayne Green, publisher of *CD Review*. He reminded Congress of an earlier promise that it wouldn't pass a home-taping bill unless the music industry proved that it needed relief from genuine sales losses—a claim that Congress's own official OTA study found little basis for. *Audio Week* quoted Green's assertion that the royalty tax appears to be a subsidy for the six international megacorporations that control 95% of all record sales; *ie*, a source of extra income at no cost to them.

CD Review depends on advertising from record companies, so you could say that Wayne (a New Hampshire maverick of long standing) was biting the hand that feeds him. But for years he has done music lovers a genuine service by promoting the work of small independent labels, in part by producing and distributing cheap sampler CDs that expose people to a much greater variety of interesting music and good recordings.

Since the bill has many cosponsors, including several members of the committee, it could pass Congress as early as April. But one Congressman asked Radio Shack chairman John Roach how he could defend the royalty if constituents view it as a ripoff—and why it shouldn't be viewed as a tax. Roach's reply: Consumers are being educated that the bill is a fair compromise whose benefits outweigh the small cost; and the royalty is not a tax because the money will flow to copyright owners, not to the government.[1]

1 Yeah, right, and—in the words of Mike "Wayne Campbell" Myers—"Monkeys might fly out of my butt!" As I said last September, if it swims like a duck and quacks like a duck, it's a duck. This "royalty," like the proposed levy on cable TV service to compensate the networks for their falling market share, is a tax. A TAX! The real reason hardware manufacturers are supporting the tax is because they fear that without it, the record industry will block the introduction of those potential cash cows DCC and MD, just as they did with DAT. And once a precedent has been set by the introduction of this tax, then you just watch what other areas of business will be next to jump on the gravy train.

In my humble tax-paying opinion, the government should not be in the business of raising money for the specific benefit of a small number of privately owned conglomerates—one smaller in number since Britain's Thorn-EMI agreed to pay $877.2m and assume $86m worth of debt for the last remaining big independent, Virgin, in early March—without the latter having to raise a languid finger. Lobbyists, those involved in funding PACs, and politicans with their snouts in the trough, will no doubt disagree, however. —**JA**

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US: J. Gordon Holt

I was saddened to learn recently that audio pioneer Paul Weathers passed away on February 23. Best known in audio circles as the inventor of the Weathers FM phono pickup, Paul was a brilliant inventor and a very special person.

Born and raised in 1904 in rural Indiana, Weathers was a Junior in Electrical Engineering at Purdue University when he was recruited by the RCA Victor company to do design work. (He intended to return to Purdue to finish school, but never did.) While at RCA, his contributions were as diverse as inventing a device for optically checking soft-drink bottles for rat hairs and cigarette butts, and debugging some of the early RCA color video recorder designs. After 14 years, he left RCA to do freelance consulting, and shortly thereafter founded Weathers Industries to market the world's first (and second-to-last) FM phono pickup. A year or so later, I quit *High Fidelity* magazine to work for Weathers Industries.

Paul was a very thoughtful and gentle person—a marvelous man to work for, despite a formidable demeanor. (When I knew him, he looked a bit like Brutus Thornapple's boss in the "Born Loser" comic strip.) He had a prodigious temper, but almost never raised his voice in anger; instead, he would signal his displeasure by turning bright red.

Weathers was not, however, a great businessman. He loved a design challenge, but when it was met he lost interest and moved on to the next challenge, preferring to leave such trivial technicalities as production and sales to his loyal manager, Martha Cuneo. (Marty worked for Weathers for more than 40 years, until his death.) Worse, when he'd solved a problem, he didn't care what happened to the solution. A friend of his said Paul had probably given away more ideas (to consulting clients) than most people come up with in a lifetime.

After the FM pickup, Weathers Industries produced a low-mass, viscous-damped wooden tonearm for it, then a unique turntable that used a lightweight platter, a very-low-friction bearing, and a soft-contact idler drive to minimize rumble and maximize speed stability. Next was the PS-11 pickup system, a stereo cartridge that tracked cleanly at an unprecedented 1.5gm. (Claimed to be a strain-gauge cartridge, the PS-11 was actually a highly refined ceramic-transducer system. It was explained to me that, since "everyone" knew ceramic pickups were godawful, the deception was necessary to avoid consumer prejudice. That was probably true, although I didn't agree at the time.)

Then there was the Trio—possibly the first satellite/woofer system ever marketed. The satellites had wide lateral dispersion and were designed to look like largish books (with a fine-mesh dull-aluminum spine). They were intended to be concealed in a bookshelf, to minimize diffraction effects and avoid drawing attention to the sources of the sound. The down-firing woofer, in an enclosure barely 4″ deep, had its cone mass-loaded to lower its resonance, and its own dedicated amplifier was equalized to provide a more or less flat response to around 38Hz—pretty respectable bass extension even today.

My job at Weathers Industries was to turn out technical information bulletins for dealers. These irregularly published newsletters[2] first covered such mundane topics as price changes, new-product information, and service and maintenance tips. Then I added hints and suggestions about installing Weathers products. Then I added a short record-review section. Then I started including a rabble-rousing editorial in each issue. Then we noticed that many dealers were asking for multiple copies of each issue, to hand out to customers. That was when I decided to publish *Stereophile*.

When I mentioned my plans to Paul, his response was typical. He thought it was a good idea, urged me to do it, and wished me luck. (I later learned that he was disappointed when I left, but he never told me himself. That's the kind of man he was.[3]) I left Weathers Industries in '62 to start this magazine.

In the mid '60s, Weathers Industries was bought out by Advance Industries, which later sold it to Teleprompter Corp. Teleprompter had made big money selling script readers for TV announcers, and had decided to diversify. Unfortunately, they had no idea what perfectionist audio was all about, and allowed their Weathers division to languish. Paul quit in 1966 and retired.

Of course, it couldn't last. Within days, he

2 Early *Stereophile* subscribers soon learned the meaning of that word. One of them even suggested we call the magazine an "aperiodical."

3 A real businessman would have found ways to make sure I would never again find work in audio.

was itching to be doing something again, and his next project was a home-electronics repair facility called Weathers Audio/Video Service, which actually repaired anything that looked even remotely electronic, including microwave ovens, garage-door openers, and TV remote controllers. Many of the people from Weathers Industries joined the new company, but it got started during a minor recession and did not exactly take off right away.[4]

In more recent times, Paul read a *Stereo Review* article by Julian Hirsch about a new subwoofer, and his reaction was, "No, this design is WRONG." He then spent some weeks designing a subwoofer that he felt overcame the failings of the one he'd read about, and was finishing the design of a dedicated amplifier to drive it when he came down with what seemed to be a bad case of flu. Hospitalized, he complained bitterly about the waste of time; he wanted to be working. Lab tests revealed nothing, but he suddenly took a turn for the worse and was gone. An autopsy showed he was riddled with cancer. He was 86.

There is a possibility that Paul Weathers's last design—the powered subwoofer—may be released as a posthumous product. I'd like to think that would have pleased him, but I don't really believe it. He had already wrapped up that challenge, and would have been ready to move on to something else. That's the way he was.

US: Peter W. Mitchell

After a two-year debate about issues of cost, recycling, graphics, shoplifting, and retail-store convenience, the record industry has decided on a replacement for the longbox. The 6" by 12" longbox was invented only because American retailers wanted to display CDs in existing LP bins instead of buying new display racks designed for CDs. In most of the world, CDs are sold in their jewelboxes. For nine years US consumers have been battling with paperboard boxes and plastic blister packs to get at the CD, booklet, and jewelbox within—and discarding a mountain of trash in the process.

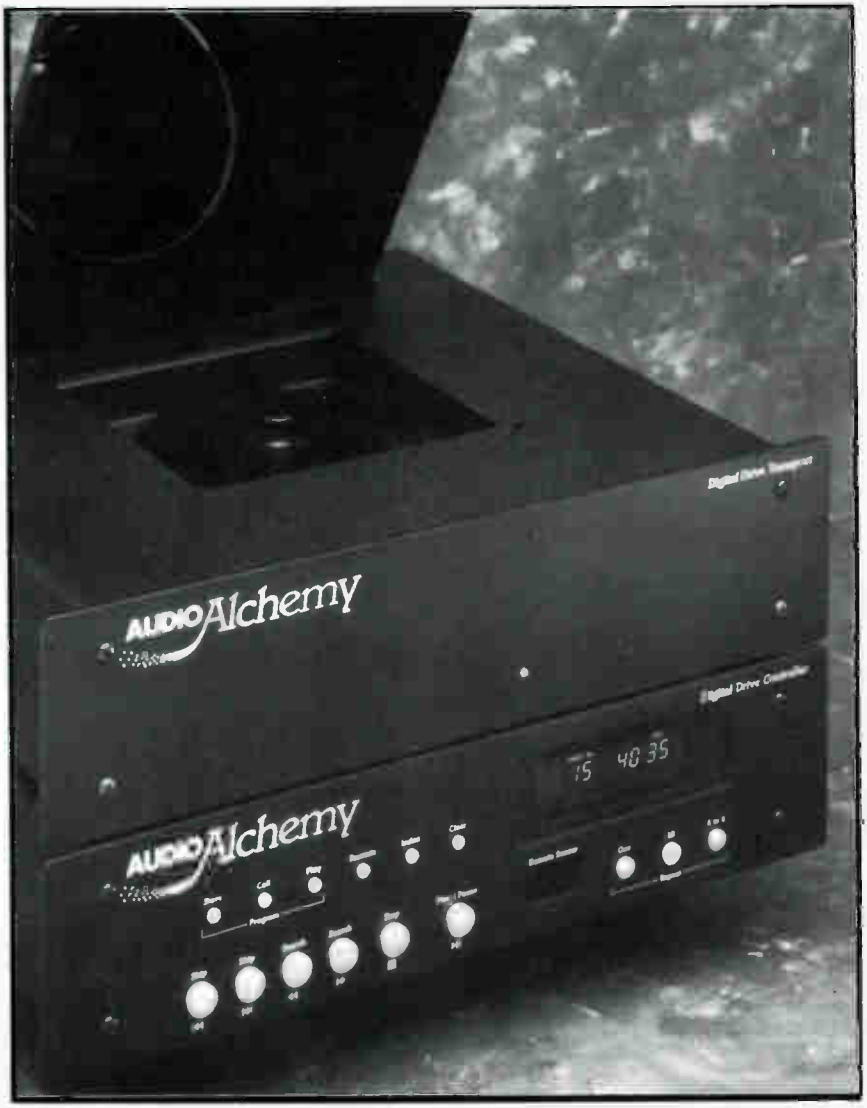
Publisher Wayne Green campaigned vigorously against the longbox in his *CD Review* (formerly *Digital Audio*) magazine. Since the longbox existed only for the retailer's convenience, he suggested that CD shoppers should also give the retailer the resulting trash-disposal problem: whenever you buy a disc, remove it from the longbox in the store and take only the jewelbox home. A few sympathetic record stores even installed trash barrels near their cash registers. Two anti-longbox bills were introduced in Congress that would prohibit any retail packaging more than an inch wider or longer than the CD or cassette itself. Ecology-minded musicians in Hollywood took up the campaign, and the battle was joined to find a less wasteful package.

The principal candidates were of longbox dimensions, in order to save the LP bins. Albums by Sting, Bonnie Raitt, and the Grateful Dead were released in the Digitrak, a cellophane-wrapped paperboard package that could be folded to jewelbox size for storage at home. Warner/Elektra/Asylum favored the Eco-pack, a modified Digitrak with a hard-plastic stiffener, but this still generated some non-recyclable trash. Another folding paperboard package, the C-case, had pockets for discs and program booklet. The C-case was said to be totally environment-safe: it used no petroleum-based plastic, its paperboard was made from recycled paper, and even its inks and coatings were nontoxic and biodegradable.

None of these cardboard alternatives dealt with the issues that motivated the design of the jewelbox in the first place. CDs don't wear out, may last for decades, yet require focusing tolerances of only a few millionths of an inch during play. The jewelbox has an expansion hub that supports the CD with no pressure anywhere on its surface, in order to minimize warping or deformation of the disc during years of storage. When it seemed that the industry might be on the verge of abandoning the jewelbox, a counter-campaign began. Surveys showed that, unlike longboxes and blister packs, jewelboxes are seldom discarded. When they are, they can easily be recycled since they are just polystyrene. There were proposals for packages that would display the jewelbox folded open within a transparent plastic wrap, allowing the front and back of the booklet to be seen as well as the disc; but the problem of disposable trash remained.

The RIAA finally capitulated. In April

4 It's still in business, at Route 73 and Cushman Ave., Berlin, NJ 08009. Tel: (609) 753-1929.



AUDIO Alchemy

Digital Drive System

Introduction: The DDS CD Turntable is a high performance top-loading design consisting of two separate enclosures with outboard power supplies. The Transport, with its mechanically correct clamping system, maintains precise laser focus and disc rotation, minimizing data error and 'jitter'. The Controller houses the command processor (accessed directly or via a full function remote) and circuitry to condition the digital stream for transmission. The result: Maximum data retrieval with the minimum of fuss.

Conclusion: The DDS will do for transports what the Engine did for D/A converters . . . turn the industry on its head and the music-lover head over heels with joy. At last, a CD transport that delivers heavenly performance at a down-to-earth price.

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1993 the US will join the rest of the world, packaging the CD jewelbox in nothing more than a cellophane wrapper. Record stores are stuck with the problem of replacing their old LP bins with new CD racks, and of making CDs harder to steal. Shoplifters may find DCC cassettes and MiniDiscs even more tempting, since they are smaller. So, although opponents often claimed that the longbox added a dollar to the retail price of every CD, don't expect to see prices drop when the longbox vanishes. Some of that money may be used to pay for new display racks and anti-shoplifting technologies.

US: Arnis Balgalvis

Say DMP and the response is: "digital." After all, DMP stands for Digital Music Products. It's well known that DMP records nothing but jazz and releases nothing but CDs.

The man behind DMP is Tom Jung, a perfectionist who works incessantly to create the best product possible, with realistic sonics being a very high priority. Having had many conversations with him about playback equipment choices, I know Tom to be a man dedicated to getting the most out of the CD medium. The many accolades accorded his efforts testify to his success.

But DMP is about to release—guess what?—LPs. I kid you not. Just got off the phone with Tom, and they're well on their way.

As I write, DMP is in the process of evaluating D/A converters—after all, their masters are pure digital—in order to get the best possible analog signal for feeding the cutter-head amplifier. The Sony 1630 is not for them, thanks. Mastering will be done at Masterdisc by none other than Bob Ludwig and Tom Jung himself, using the Direct Metal Mastering process. Then it's off to Germany for pressing the LPs, using—get this—220gm vinyl. I told you Tom was serious about his work.

To those surprised by this development, don't be. Tom was recording and producing LPs long before digital. I have on my shelves a Direct-to-Disc LP on the Sound 80 label, recorded by Tom in 1978. And he was actively pursuing that career well before then. It's refreshing to know that Tom's roots are firmly entrenched in analog, and that we'll be able to sample the latest fruits of his work on LP.

Four titles are scheduled for the initial release: *Tricycle*, *Different Strokes* with the Robert Hohner Percussion Ensemble, Warren Bernhardt's new *Reflections*, and a *DMP All Star* LP featuring popular tracks from various previously released works.

When? Sooner than you think. Those who attended *Stereophile*'s High End Hi-Fi Show last month may have gotten a chance to hear the DMP LPs—the plan was to have several sets of test pressings make the rounds at the various exhibits. Tom said they were working to meet that date (for obvious reasons). At any rate, production should be far enough along by now to have finished LPs in time for next month's Chicago CES.

UK: Ken Kessler

Maybe I spoke too soon. Last month, I told you of vinyl's demise; this month, would you believe pro-vinyl backlash? And not just from loonie-tunes audiophiles?

You know that the audiophiles haven't given up, and that turntables, arms, and cartridges continue to—at least—warrant reviews. But who'd have thought that one of the few retailers coping well with the recession is a shop which stocks *only* analog sources and tube equipment? Not I, but that would be to disbelieve sources I know to be dependable. And if someone can run a decent business stocking just tube gear and turntables, then there's hope for all of us.

I'm at a loss to explain just why LPs seem to be enjoying a comeback, other than attributing it to the shock-horror nature of W.H. Smith's announcement to stop selling them. Maybe that inspired the diehards (non-audiophile variety) to come out of the closet. Hell, this morning when a photographer came by to do a shoot for one of the magazines, he was pleased to see my turntable a-spinning, commenting that he still couldn't come to grips with CD and had yet to buy a CD player. And this guy was a civilian, not a card-carrying hi-fi casualty. But his reluctance to go for CD sounded just like the utterings of any analog-committed audio casualty.

In this morning's post, I received the latest mailing from Demon Records' mail-order service, Blackmail. These semi-regular mis-

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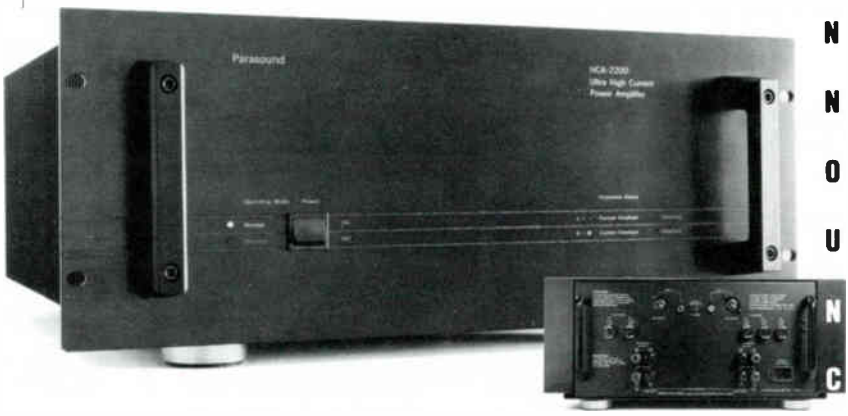

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sives are a godsend for those who don't have access to other than the kind of shops which think that "back catalog" is some kind of profanity. As Demon is, first and foremost, a reissue label dealing with cult or special-interest artists, it's to their benefit to offer their releases directly to the consumer. The catalog contains material from Elvis Costello, Nick Lowe, Al Green, Graham Parker, and others, plus killer reissues from Ace Records, so it's not some desperate company trying to flog medieval music or trendy ethnic dross. And still they have to supplement the major retailers, which are unequaled in their competence.

And what's emblazoned across the front of this six-page folder? "*Vinyl Is Not Yet Liquidated*." I quote further: "On the inside pages of this brochure you will see a list of some 300 albums, a selection from a total of over 1000 titles of which the majority are still available on vinyl, a format that we will continue to support." The list goes on to include every title with the available formats indicated after each entry. Oh, and there's even an inducement to "Buy Four and Get One Free," which means that five LPs can be purchased for £5.99 each, cheap by today's standards.

Now I'll admit that a casual remark from a civilian and a mail-out from a record company aren't sufficient grounds for celebration. And I hadn't really thought too much about the increase in the number of black vinyl LPs I've received lately for review, after a couple of years when nearly 97% of the review copies arrived on CD. And then I picked up the March issue of *Record Collector* and just had to think again.

Record Collector is the UK's Number One collector's magazine, sort of like a British *Goldmine*. It's noted for its discographies, broad taste, and (one major weakness) an obsession with the market value of collectibles, usually with prices which have no bearing on reality. But that's something easily ignored. Anyway, the magazine has always been evenhanded about LPs and CDs, merely accepting the latter as another format to collect. And while it has always monitored vinyl's demise, the magazine has never dealt with the topic other than matter-of-factly.

With nothing but admiration for their researcher (and a free plug by telling you that *Record Collector* can be ordered from 43–45 St. Mary's Road, Ealing, London W5 5RQ, England), I learned that a pressure group has been formed, calling for "a halt in the rush to coerce everyone to switch to CD," and casting doubt over the "falsely hyped, so-called perfect sound of Compact Disc." This is heavy stuff to publish in a magazine with an advertising base made up almost entirely of dealers, many of whom stock expensive import CDs, and reissue labels heavily into digital.

Among the sigh-inducing points in this news item were:

- Tony Wadsworth, in charge of current releases at BMI, confirmed the label's support of vinyl as long as there's demand.
- A survey by industry magazine *RPM* showed that, of sales for the Top 75 albums for rock acts, 20% were on vinyl (this confirms remarks made to me by an Our Price Records employee who preferred to remain anonymous), but that vinyl sales for major acts like Tina Turner and Queen were low.
- 7″ singles still sell in decent quantities, primarily if a single hits the Top 10; below that point, CD singles are the preferred format.

But on to the pressure group: Analogue Addicts has been around for a year, and exists to support the specialist shops which haven't followed the lead of the majors in axing vinyl. Amusingly, the group cites activity in America (*eg*, CBS reissues such as the Robert Johnson box, which was not released in the UK on vinyl) as proof that consumers still want the option to buy LPs. What this group can do, besides lobby for the shops stocking vinyl, is unclear. I'd be the last person to suggest holding record-company executives hostage, but AA is seriously committed to restoring freedom of choice to the music-buying consumer. If you want to add your support, contact Analogue Addicts at 22 High Street, Keighley, West Yorkshire BD21 2AA, England.

Again, I don't want to create false impressions; you'd be disappointed if you visited the UK expecting it to be awash in LPs. The real world is gearing up for DCC and CD-I, even though the launch of the former has been delayed until "autumn," while the latter's UK launch date is also unspecified. What might preempt both is CD-R (recordable CD), with Meridian and Mission trying to be first in the shops. Apparently, Meridian already has review samples of their CD-R player prepared and about to be dispatched.

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No one has yet answered the question, "Why bother?" For the professional sector, CD-R will have quite realistic applications, especially for studios sending out working roughs for musicians to hear at their leisure, for record labels wanting to send out advance CDs rather than cassettes to important reviewers, and for radio stations doing small runs for limited distribution. But for the home user? It seems like a mighty expensive way to put together your own compilations, or to rip off someone else's CD/LP/tape.

One quite amusing defense of CD-R, running counter to the glimmer of a vinyl revival, is the use of the format to archive one's LP library. Tape all your records and play the CD-Rs. I seem to recall a similar argument for DAT, which now stands for "Defunct And Terminated."

As for the costs of the blank CDs, well, they'll have to sell for less than half the price of the CD being, er, copied. That's why the blank cassette did so well as a home recording medium: a top-quality C-90 costs a third of the price of an LP, a fifth the price of a CD. If the blanks sell for £8 or more, the format will have about as limited an audience as a system can have without being declared a total non-starter. But, unlike DAT, CD-R has one saving grace: Even if you end up not recording with it after the novelty wears off, at least it will play conventional CDs.

So expect a very confusing Autumn '92 in the UK, what with CD-I, DCC, and CD-R all vying for the limited disposable income available for hi-fi purchases, and from customers who barely understand CD, let alone the rest. To make matters even more amusing, Pioneer—according to the Channel 4 TV show "Video News"—will be relaunching laserdiscs with renewed vigor.

Leaving aside PAL-related problems with establishing the format, the reason why laserdiscs never took off in the UK is down to choice. Put politely, there was "bugger all" choice of titles, unless Dire Straits videos are your cup of tea. The smart buyers purchased the Pioneer dual-standard player (NTSC and PAL) and ordered software from the laserdisc-rich US, or even Japan (an activity which UK labels hate with a passion). So despite the UK's reputation as video-mad (which it is), the best home video system has never had any impact here.

Why should 1992's relaunch be any different? Think about this magic expression: "combi-player." Theta got in there with its audiophile transport, to supplement the Pioneer device which plays all sizes of laser-read discs. But who'll be the first with a laserdisc player which reads normal 5″ and 3″ audio CDs, 8″ and 12″ laserdiscs, *and* CD-I/CD-ROM, with CD-R recording capability as well? My nod is to Meridian, now owned by the wealthy Polk. Produce a machine like that, with at least five years' intrinsic non-obsolescence, price it at under £1000, and you've got a license to print money.

US: Peter W. Mitchell

In the April *Stereophile*, you found reports from the 1992 Winter CES (held in January in Las Vegas) from my colleagues, who wore out the soles of their athletic shoes trudging throughout the entire show searching for every new high-end product. As usual I took a more selective approach, trying to identify the most important new developments in electronics and the loudspeakers that seem most deserving of a full review.

Beginning with the semi-trivial, the **Fisher** division of Sanyo surprised everyone with an innovation. (Sanyo is better known for having some of Japan's lowest-cost manufacturing facilities than for inventing new product ideas.) The new Fisher PCD-7 portable CD player ($499) actually featured two innovations: 1) Its operating controls are not on the player itself, but on the headphone cord. So if you're strolling in the park with the player concealed in a belt pack, tote bag, or padded carrying case, you no longer have to reach into the bag to find the Pause control; the buttons and LCD display are halfway down the cord. Borrowing from Sony's Mini Disc, the PCD-7 has an anti-skip mode in which the disc spins at double speed and more than a half-second of read-ahead data is stored in a four-megabit memory. If vibration causes the player to skip, the pickup has time to get back on track before the memory's contents have been dumped out to the decoder. Don't be surprised to see this feature in many CD portables next year.

In a more esoteric vein, I was attracted to a demonstration of the **Duotech** Cable

Enhancer ($179) by a brochure whose headline read "Sounds like snake oil, but works like magic." This product "burns in" new cables more rapidly and thoroughly than simply playing music through them would. It exercises the cable with a relatively high-level signal (10V peak-peak and 0.5A), consisting of harmonically rich squarewaves that are varied randomly in frequency over a wide range. I'm generally skeptical regarding claims made about cables; would I hear a difference? In three sets of A/B comparisons between a burned-in cable and one that had been used only slightly, I did hear a clear difference in the character of the sound. In two out of three I preferred the un-burned-in cable, but that's not the point. What counts is that this device does appear to make an audible difference.

In the years before the CD was launched many listening tests were done, involving audiophiles in Japan as well as the US and Europe, to discover their high-frequency limit of hearing. Typically these studies began with a wide-range recording made with microphones and recorders extending to 40kHz or so; then various filters were switched in and out to discover at what cutoff frequency people began to hear a subtle difference in "air" or timbre. Many adults were unable to hear filter cutoffs as low as 15kHz, while younger listeners heard differences up to 18 or 20kHz. These studies led to the choice of a 44kHz sampling rate for digital audio with a maximum recorded bandwidth of 21kHz for music.

Despite this body of research, a minority of audiophiles have always insisted that a wider bandwidth sounds subtly better. A recent study, mapping electrical activity in the brain, indicated that ultrasonic harmonics may have an effect even in listeners who cannot hear discrete tones above 20kHz in a test. New **Pioneer** Elite CD players contain a "Legato Link Conversion" circuit that attempts to address this issue by synthesizing the ultrasonic harmonics that are missing from digital recordings. It's the obverse of a decade-old dbx product, known as the "sub-harmonic synthesizer" or boom-box, which detected bass tones and added "missing fundamentals" an octave lower. Evidently the Legato Link detects high-frequency tones and generates harmonic overtones. Such a process is, of course, a form of distortion. Indeed, the difficult part of this notion is to devise a way to synthesize harmonics without producing harsh-sounding intermodulation distortion products at the same time.

The **Marantz** CDR-1 compact disc recorder crowns a new series of components, based on Philips technology and built in Japan, with gold front panels resembling the legendary products produced by Saul Marantz a quarter-century ago. Distribution is limited to only two dozen US dealers. Like Pioneer's CD recorder, the CDR-1 is said to be totally Red Book–compliant, meaning that CDs recorded on it will play on any consumer CD player—unlike a few earlier CD-R machines whose discs will work in most players but perhaps not in all.

Like the Denon CD-R deck introduced last summer, the Marantz CDR-1 is aimed mainly at recording studios. Typical applications: reference discs of mixdowns for performers to audition at home, compilation CDs of commercial jingles for radio station use, and limited-production runs (50 or 100 CDs) of special-purpose recordings. But in contrast to the $20,000 Denon, the $7000 price of the Marantz is approaching the level at which some audiophiles might want one for personal use.

CD-R is a "write-once" format; after a disc is recorded with its final TOC (table of contents) track, it can't be altered, erased, or re-recorded. So why would you want one? Two possible reasons come to mind: 1) Besides recording CDs, it also plays them, and thanks to its industrial-grade low-jitter transport it might prove to be a superior-sounding player. 2) According to David Birch-Jones of Marantz, CDs recorded on the CDR-1 exhibit a cleaner "eye" pattern than most mass-produced discs. (This refers to the actual radio-frequency signal at the optical pickup.) Also the deck has a calibration mode that records a test track in a reserved area on each blank disc and automatically adjusts the intensity of the recording laser to generate pits of optimum depth.

Result: Discs recorded on the CDR-1 may sound better than conventional pressings. Meridian's Bob Stuart was even quoted in England's *Audiophile* magazine to the effect that a CD-R copy of a mass-produced CD can sound better than the source disc! If this proves to be so, perhaps we can envision special audiophile CDs that are manufactured

individually on CD-R decks rather than being mass-produced in a molding press. Or, in view of the limitations of the U-Matic VCRs used to make most CD master tapes, perhaps it's time to revive the popular "direct-to-disc" movement that worked so well in the 1970s: Bypass any master tape and record direct to a CD-R from the microphone preamp.

To demonstrate the CDR-1 and the new DCC recorder, Marantz was using a pair of **Snell** Type B loudspeakers, which have been reviewed both pro and con in these pages. After praising the Snell B sound that I heard at last June's CES, I was shocked at how poor the review pair sounded in *Stereophile*'s Santa Fe listening room a few weeks later. Besides the sluggish bass and thick lower-midrange that Larry Greenhill described in his insightful February 1992 "Follow-Up," the imaging was surprisingly flat, lacking any depth or "air." Remarkably, in the Marantz exhibit room I again heard the excellent qualities that had so impressed me last June. Not only was the bass not fat, it even seemed a little lean for my taste. (I like a more bass-rich balance than some folks do.)

My colleague E. Brad Meyer noticed a clue to this puzzle: Like most industrial buildings, the CES demo room had a false ceiling. Above the acoustical-tile panels were an airspace, ventilation ducts, and a rigid roof. Such an arrangement—a lightweight boundary with an air cavity behind it—is known in recording studios as a "bass trap." Wood-frame houses often contain bass traps: inadequately stiff walls, ceiling, and floor that transmit bass energy to adjacent spaces. The Snell B seems to be "voiced" for such environments, which are very common in the northern half of the US. However, in a modern high-rise apartment building (with a precast-concrete floor, ceiling, and outer walls), or the style of housing common in the Southwest (a solid concrete floor, no basement, and heavy exterior walls that don't flex), all of the bass energy stays in the room, producing a bass-heavy sound. In such housing you're better off with a speaker that has a leaner bass balance, or with a separate subwoofer whose level and contour can be tailored to match the room.

Meanwhile the Snell exhibit featured the B Minor ($3300/pair), a less bulky version of the B with a single woofer in a four-sided enclosure instead of two woofers in a five-sided box. It seems to have many of the B's qualities, but with its less overwhelming bass, it might work better in Santa Fe.

When I wandered into the **Swan's Speakers** room on the second day of the show I was surprised and delighted to encounter proprietor Jim Bock, visibly suffering from lung cancer but alert and happy to be there. When he told me that he had fine-tuned the balance of the $6000/pair Cygnus speaker system, strengthening its lower midrange slightly to undo the slight forwardness that I'd heard at the previous CES, I sat down expecting some serious listening pleasure. But the sound of familiar CDs was disappointingly bright and hard. The former slight excess around 1kHz had seemingly been replaced by a 2kHz peak; yet a quick pink-noise measurement with my Ivie spectrum analyzer revealed smooth response in that region. Jim's on-axis MLSSA response curves confirmed my measurement. Could there be an off-axis mid-treble hump that was being reflected off the side walls?

Jim suggested a different hypothesis: The unpleasant quality might be due to the Wadia X-32 decoder which he had borrowed and was not happy with. I was skeptical; I've heard differences among D/A converters, but never one that so obviously resembled a frequency-response peak. To persuade me, Jim played a familiar LP (Jennifer Warnes singing Leonard Cohen's "Bird on a Wire"). The speaker's sound was rich, warm, and liquid-smooth—no trace of a peak. Obviously there was something not right with the D/A, so I promised to come back after they had obtained another from a different company. (When I returned home I looked up the X-32 in last October's "Recommended Components" and read, ". . . a forward presentation in the mid-treble." It was forward, all right—like a poke in the eye!)

The next day the new D/A was in, but it needed to be burned in for a few hours. So I returned again on the last day with the same CDs, and experienced sound that was shockingly wonderful. That the Cygnus speaker is capable of gorgeous sound was not a surprise; Jim Bock is a wise designer with an excellent ear, and the Cygnus deserves your attention. But I was shocked by the size of the sonic transformation that had been wrought by a change in D/A processor. We're not talking about a subtle improvement here,

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folks. This was some of the best sound I've ever heard from CDs, anywhere—with "bloom" and air and surging dynamics that seemed to breathe with each musical phrase. It took a lot of willpower to drag myself away to cover the rest of the show. The D/A that accomplished this wonder was from the **Valve Amplification Company**, whose power amps have been praised in these pages. The VAC DAC ($4990) combines jitter-resistant passive logic circuits and dual-differential Bitstream D/A with class-A triode output stages. Its front-panel indicator is instant nostalgia: a "magic eye" tube like those in FM tuners of 30 years ago!

Irving "Bud" **Fried** believes that impulse response is the best test of a loudspeaker. If the impulse response is truly correct, more conventional measurements such as frequency response will also be right. Fried favors transmission-line loading, not only for subwoofers but also for midrange drivers. With such loading the driver is free to accelerate quickly without having to work against back-pressure in the enclosure. Some Fried designs have impressed me more for lively dynamics than for tonal accuracy, but the D/2 system is an unqualified triumph. This slim tower speaker consists of the Fried C-3/L minimonitor atop the matching D/2 subwoofer. Familiar CDs achieved that magical quality, which I seek but seldom find, of airy transparency and great resolution of inner detail without excess brightness. Voices and instruments were located in space with amazing specificity, enveloped in air that I could almost reach out and touch. Musical timbres had an authentically lifelike texture, without "hi-fi" hype. Highs glistened like sunlight sparkling on dew, without grit or edge, and piano was genuinely percussive without becoming strident or penetrating. Did I like the sound? I wanted to stay there all day, listening to one CD after another. The D/2 system lists for $4500/pair, but if you're skilled at carpentry you can assemble it from a kit for less than half-price.

The Peak One and Peak Two speakers from **Wavefront Acoustics** look and sound like many studio monitor speakers. The cabinets feature an internal lattice construction that, like the B&W "Matrix" design, stiffens the cabinet to prevent resonance. The speakers play very loud, with a lot of dynamic impact and an impressively clear, analytic presentation of well-resolved detail. But the image seemed shallow and the treble too bright, with slightly wiry strings and a pinched quality to the saxophone. I found myself wondering whether the **RoomTune** panels that had been placed near each speaker might be aggravating rather than alleviating the problem of reflected off-axis sound.

Forty years ago an acoustics textbook by Olson illustrated why building speakers in rectangular boxes is a bad idea. Flat front panels affect a driver's radiation pattern, and edges act as secondary re-radiators because of diffraction. But most speakers are still built this way because a molded, cornerless, semi-rounded cabinet is a very expensive form to make, especially if it also has to be rigid and non-resonant. Case in point: the Pro-Klaim I, produced by a company called **Speaker Art by Spectrum Dynamics**. On one hand it's a basic two-way dynamic speaker, with an 8″ woofer and 1″ soft-dome tweeter. On the other hand it costs $15,000 and sounds like it. This is one of the most transparent, airy, uncolored, mud-free speakers I have heard. Bass is clean and strong to below 25Hz, highs seem to go on forever, and the midrange is as clear as polished crystal. My first thought was that a speaker this transparent belongs in every mastering studio, so that engineers would know exactly what's in their recordings. The speaker is 15″ wide and deep, stands 4′ tall, and appears to have been sculpted out of polished stone with a sloping front and rounded corners. The enclosure, actually a dense molded polymer composite, also sounds like stone when rapped with a knuckle. My sole reservation was that the speaker's overall tonal balance was slightly too bright, at least for playing CDs; it might be just right for LPs, which usually have a slightly mellower balance. But after the show ended and the exhibitors were packing up, I ran into designer Bill Gross in the hall. He reported that rearranging the RoomTune panels in the room had alleviated the excess brightness.

The Beolab 8000 from **Bang & Olufsen** resembles an organ pipe, or perhaps a big aluminum pencil with its sharp point embedded in a black cast-iron base to keep it upright. Only 6″ in diameter by 4′ tall, with a flat black grille on the front, it seemed calculated to create low expectations. The company's previous metal-column speaker, the

Penta, didn't impress me much, so I was prepared to dislike this shiny cylinder as well. The room was almost empty and too reverberant, which I suppose is appropriate for a speaker whose appearance cries out "Danish Modern." In spite of everything, the speaker sounded really good. Highs were smooth and spacious, lows went a lot deeper than you'd expect from a pair of 4″ woofers in a slim cylinder, and the midrange was well balanced. I suppose I shouldn't have been surprised. B&O products always represent a radical design statement, but they sometimes produce fine sound too. The 8000 is an active system with internal equalization, an electronic crossover, and two built-in 80W power amps for the tweeter and dual 4″ woofers in the popular D'Appolito configuration.

The Clearfield Metropolitan ($6000/pair) from **Counterpoint** makes a different statement. Five feet tall by 2′ wide, this is not a system that disappears into the decor. Fortunately it's available in several fine wood finishes, including Rosewood; since you can't avoid seeing it, it may as well be a beautiful piece of furniture. It also sounds exquisitely smooth and musical, though not especially airy. Its lows may be a bit too rich in rooms that hold bass, but it was a pleasure to hear.

The **Philips** DSS930 digital active (self-powered) loudspeaker resulted from a three-year development project. It employs digital signal processing to make a time-coherent, phase-correct crossover, and also uses DSP to equalize its driver irregularities and low end. This yielded a system that measured flat within 0.5dB in the anechoic chamber but really didn't sound good. Philips then spent another year fine-tuning the design to yield an optimum combination of accurate on-axis output and smooth off-axis room sound. Since Bitstream D/A and bi-amplification are built in, the speaker accepts a digital signal from a CD player or other source. Logic circuits identify the speaker as the left or right channel and as one of three systems, so that you can have a multi-room setup fed from a single digital source or control center, operated by remote control from anywhere. If the CD player is in another room but is a current Philips model, the digital connecting cable will carry remote commands from any room back to the player. Price: $2400/pair for the amplified speakers plus $520 for an optional DSC950 system controller that accepts a variety of analog and digital inputs. The sound of the system, badly sited at one end of a room in front of a picture window, did not have the vivid clarity of some audiophile speakers, but it was consistently smooth and spacious. Its voicing was skillfully done, producing a musically natural balance from a broad range of CDs. Overall it appears to be an uncomplicated, easy-to-use system designed for people who are more interested in musical pleasure than in the complex technology in the box.

The **Pfleid** FRS-20S, named for German designer Peter Pfleiderer, is billed as a full-range point-source speaker. Like the concentric Tannoy and KEF Uni-Q systems, the Pfleid aims to avoid the complex phasing problems and peculiar radiation patterns caused by using multiple drivers. Most of the sound comes from a single wide-range coaxial driver. Electronics compensate for its phase shift, yielding a phase-coherent output that evidently is able to produce acoustic squarewaves. Supplementary tweeters on the top and sides of the cabinet add user-adjustable energy to the room's reverberant field, compensating for the coaxial's off-axis droop and the absorption of the room. The sound of this unorthodox system was strikingly clear, well-balanced, and spacious. Even when playing quite loud, it didn't exhibit the intermodulation distortion I would expect from what is basically a single-driver system.

ATC, the British maker of superb tri-amplified active studio monitors, introduced a non-amplified two-way home speaker two years ago, the SCM20, which sounds remarkably similar to its big studio cousins. Its little brother, the new SCM10, uses a 5″ woofer (with ATC's usual extra-deep magnet gap for low distortion at high SPL) with a 1″ Vifa tweeter in an 8″ by 10″ by 15″ enclosure, priced around $2000/pair. ATC demonstrated it with a DAT of a live BBC broadcast of Mahler's "Resurrection" Symphony, and the sound was simply staggering in its impact, realism, and soundstaging. This minimonitor handled the huge dynamics of the symphony without strain. It even reproduced the last movement's low organ-pedal tones at believable, if not room-shaking, levels. Like earlier ATC designs, the SCM10 combines both pinpoint imaging and well-resolved detail with plenty of depth and air.

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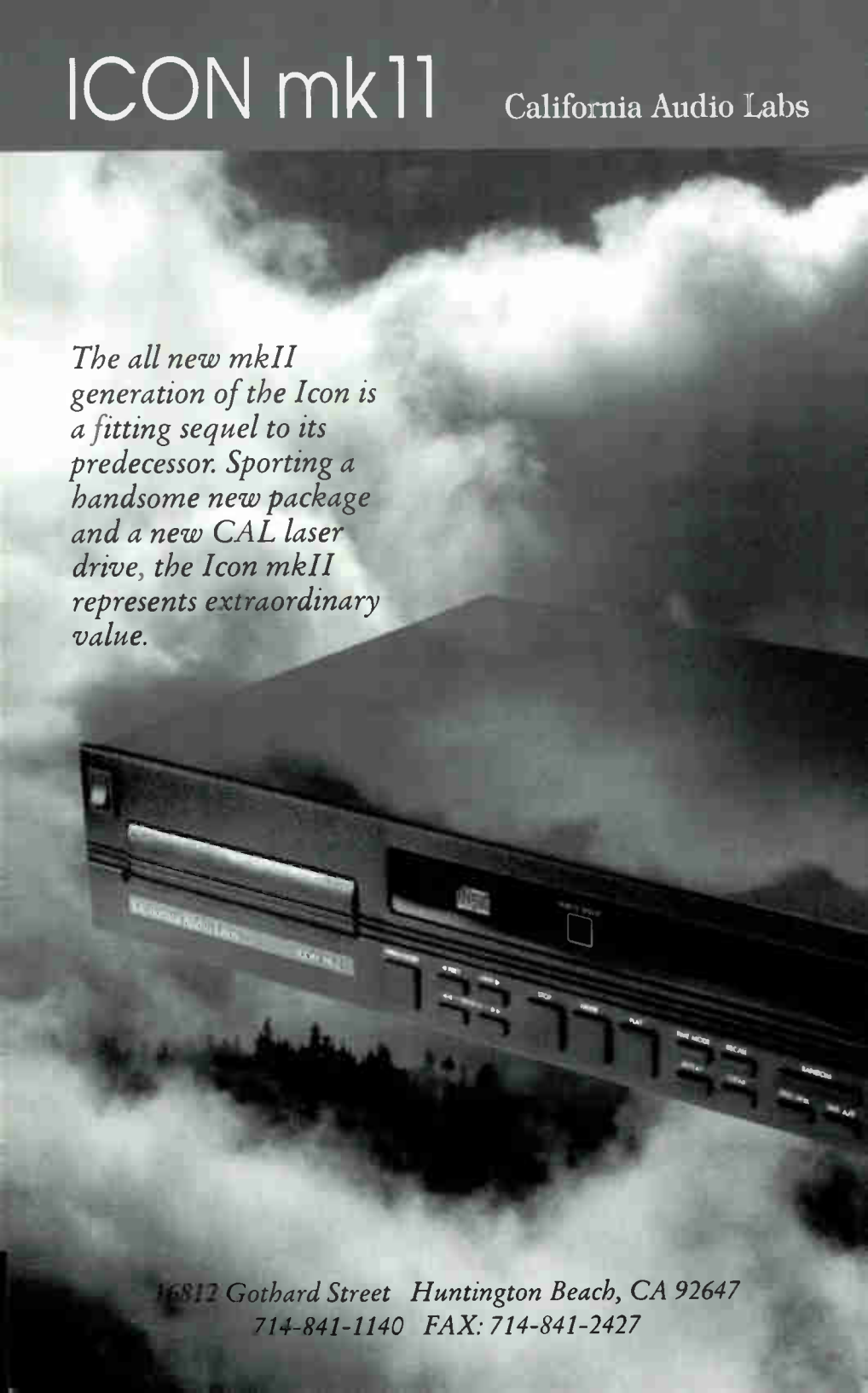

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Last year I criticized the TARDIS speaker from **Soundsmith** for midrange coloration and dull highs. Redesigned and renamed the Timelord ($5100/pair plus $3500/pair for matching subwoofers), this system is a slim 6′ column with a curved front that places its tweeter and four 6″ midwoofers at a uniform distance from the listener. It now has gorgeously smooth and spacious highs, a transparent midrange with plenty of dynamic impact, and a well-focused soundstage.

One of the biggest surprises at the show came from one of the smallest and cheapest speakers. The **PSB** Alpha costs only $199/pair. The first model in a new series from PSB, the Alpha promises to be a new entry-level best-buy. Only 9″ by 9″ by 13″ with a 6″ woofer and ½″ tweeter, the Alpha was impressively articulate, detailed, and remarkably uncolored for its price. (Don't get me wrong: the PSB Stratus Mini, at $1000/pair, sounds a lot better. In some ways the Stratus Mini sounds better than the big Stratus that TJN reviewed favorably in these pages last year. But the Alpha is a helluva speaker for someone who has only $200 to spend.) I told designer Paul Barton that he should marry the PSB Alpha with the room-shaking $500/pair SW10 tubular subwoofers from Definitive Research. That combination, bi-amplified with a couple of budget amps from Adcom, Rotel, NAD, or Parasound, would yield truly full-range sound and amazing performance for less money than many Japanese rack systems.

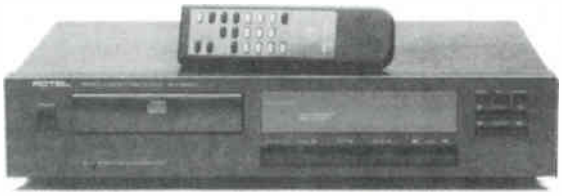
It has become a traditional mantra of audio writers to bemoan the scarcity of good-sounding new products at a typical CES. We often characterize CES with phrases like "the wake by the lake" (Chicago) and "just a lot of high-tech glitter" (Las Vegas). But at this show I was impressed by the relatively large number of good-sounding exhibits, many featuring new speaker brands not previously seen. I don't think I'm being generous here, or that I've suddenly lost my critical faculties. The reality, I suspect, is that within recent years the major driver manufacturers (Vifa, SEAS, Dynaudio, Audax, Peerless, *et al*) have acquired new measuring tools like MLSSA that revealed just how bad most of their woofers and tweeters really were. As a result, loudspeaker system designers now have a much better selection of high-performance drivers to choose from. With the aid of better-sounding capacitors and several computer programs that eliminate a lot of trial and error from the tasks of designing an enclosure and crossover network, an excellent loudspeaker is no longer a lucky accident.

US: Thomas J. Norton

Guy Lemcoe recently noticed that his barely used bottles of Kontak, a contact cleaner listed in "Recommended Components," had nearly evaporated. I pulled out my own two as-yet-unsealed sets: of the four bottles, one was nearly empty, one less than a quarter full, and two nearly full. According to John Hunter of Sumiko, Kontak's distributor, the plastic stopper inserted in the bottle under the cap should be kept to prevent evaporation. (There was no correlation in my samples between evaporation and stopper insertion.) We expect new samples, and will investigate further. Meanwhile, Kontak users should make sure all seals are tight; little enough precaution, considering Kontak's $50 cost. **S**

Rotel RCD-965BX

Best Buy



Rotel's original *RCD-865* whipped up a storm, especially from Philips which was a trifled miffed at someone else pipping it to the post with its own technology! And then there were the golden-eared reviewers who thought bitstream would never amount to much anyway.

We know better now of course, and so do the UK arm of Rotel which has spent the intervening two years working on its replacement - the *RCD-965BX*. Visually it's hardly a departure from the original, though the satin-black alloy fascia with its clear fluorescent display is a little softer on the eye. Extra features include index skipping which joins traditional track skip, search, repeat, random and program play options. There's a new slimline remote too, an attractive little handset that adds direct track access to the tally of widgets.

Inside it's all change with Philips' new *SAA7323* PDM DAC replacing the *SAA7320* used before. The *7320* family are all single-ended DACs using a total of 256 times oversampling and second order noise-shaping. Nevertheless the *SAA7323*, with its 352kHz dither, is much closer in execution to the *7320* than the intermediate *7321*.

Meanwhile Rotel has a completely new and wholly symmetrical board layout for this combination of *SAA7310* decoder, *SAA7323* DAC and analogue filter.

Lab report

This player conforms to accepted standards with a nominal 2V output, though its performance elsewhere is still far from conventional. In particular although the *SAA7323* DAC avoids the sporadic high-level idle tones of the *SAA7320*, various fixed signals, including the CLV reference tone of 7.35kHz, are still present. This drone is visible on the -70dB plot and, naturally enough, compromises the signal-to-noise ratio to the tune of about 5dB or so.

Meanwhile the 3D plot highlights the third and fifth harmonic distortions that mark the *7320* family while extended hum products can be seen to influence the player's frequency response at low levels. Interestingly, the new 1Hz noise modulation test reveals the *965BX* to be the least affected of the group even if figures for linearity and stop-band rejection are far from state of the art.

Sound quality

There was no mistaking the calibre of this player, which was greeted with unanimous applause from our panel. Yet if one over-riding feature of its sound struck our listeners, other than its generally engaging character of course, then this was its sheer poise and elegance in handling all percussive sounds. Whether it was the lone cymbal from Mary Black's *Columbus*, the harpsichord from Pachelbel's *Canon*, or the vibes and percussion from Marty Paich, all possessed an uncommon delicacy and clarity.

This sense of control and integration of even the most complex passages seems almost intuitive, for though the music has a comfortable 'at home' feel, the overall presentation is far from over-civilised or dusty. Our listeners complimented the player for its bubbly but incredibly refined performance, the music sparkling with enthusiasm and vitality but always tempered with a remarkably realistic sense of proportion.

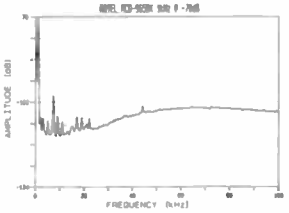
More importantly, although our listeners were duly impressed with its technical proficiency, they were utterly transfixed by the sheer conviction and passion of the music itself.

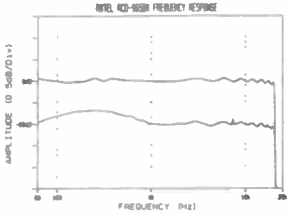
Conclusion

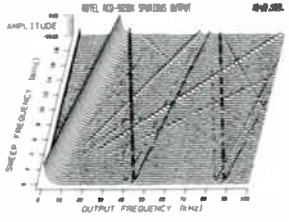
Every group test has its star performer and, this time around, it's Rotel that carries home the honours. The *RCD-965BX* is a shrewdly balanced player, equipped with a sensible range of facilities, solidly built and engineered to produce the sort of sound that many high-end products wouldn't have a hope of achieving. This is a Best Buy with knobs on.

TEST RESULTS

	20Hz	1kHz	20kHz
Channel Balance	0.01dB	0.01dB	0.00dB
Channel Separation	92.6dB	101.4dB	96.4dB
THD vs Level, 0dB	-95.5dB	-93.6dB	-70.8dB
-30dB	-79.1dB	-78.7dB	-68.6dB
-60dB	-51.4dB	-47.6dB	-40.1dB
-80dB	-24.2dB	-24.0dB	-17.6dB
Dithered, -90dB	-4.95dB	-11.2dB	-6.25dB
Resolution @ -60dB		-0.07dB	-0.08dB
-80dB		-0.60dB	-0.83dB
-90dB		-3.52dB	-3.85dB
-95dB		-1.62dB	+0.95dB
-100dB		-1.05dB	
Peak Output Level, L		2.075V	
R		2.077V	
Relative Output Level		+0.32dB	
Output Impedance		208ohm	
Radio Frequency Spurioe		2.1mV @ 11.3MHz	
1Hz Noise Modulation			+0.91dB
CCIR IMD, 0dB			-95.5dB
Suppression of stop-band IMD			55.2dB
De-emphasis Accuracy, 1kHz			-0.04dB
5kHz			0.00dB
16kHz			-0.01dB
S/N Ratio (A-wtd), w emp, 0LSB			94.3dB
w/o emp, 0LSB			93.1dB
w/o emp, 1LSB			93.6dB
Digital Output			Coaxial
Crystal Clock Accuracy			+8.8ppm
Track Access Time (99)			3secs

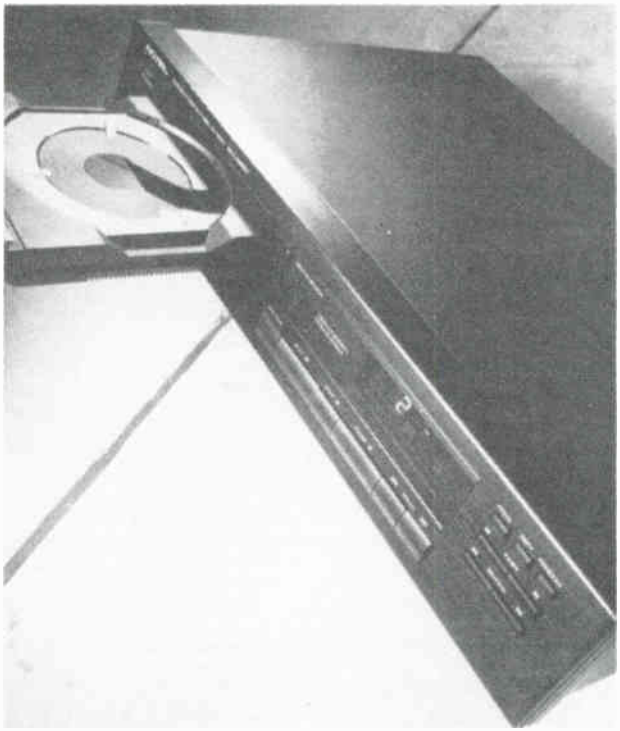






THE NEW CLASSICS

ROTEL RCD-965



In crafting a successor to its classic RCD-865 CD player, Rotel did not throw away the mould but chose instead to build upon the original's most attractive qualities. So not only is there a visual resemblance, with the 965's elegant fluorescent display and manageable battery of controls, but the sonic hallmark of the original – the lush, inviting quality – still exudes from this latest incarnation.

The RCD-965 (which carries the BX suffix) uses the very latest version of Philips' original SAA7320 PDM DAC. This is called the SAA7323, a chip that shares many of the technical and subjective features of its grandfather, thereby forging a link between the RCD-865 and RCD-965BX.

If you were to compare the two players back-to-back then you'd find the RCD-965 was the more neutral, the more evenly balanced of the two. Nevertheless, both players share the ability to communicate, to project the music in such a convincing way that the sheer presence of the individual instruments eclipses any incidental colouration of the whole.

It's not that the RCD-865 is cloaked or veiled exactly, but the RCD-965 is certainly the more transparent and delicate of the two. The 865 is warm and richly detailed, but the 965BX is capable of reaching down and drawing out the deepest bass while also soaring to the highest treble with astonishing poise and control.

If I had to choose one word to describe the RCD-965BX then that word would be 'natural'. Not natural as in neutral, civilised and boring, but natural in the sheer authenticity of its sound. The purity of its mid and treble is particularly impressive, sustaining the pristine crispness of percussion and the bite of acoustic guitar. Everything takes on an engaging clarity.

This is certainly the case with Christy Moore's *Smoke and Strong Whiskey* where the typically robust timbre of his voice can easily blunt the delicate sparkle of both strings and percussion. Not so with the RCD-965 which contains the tension and presence of his voice near the centre of the stage, while simultaneously teasing out the most exquisite detail from sax and guitars. More importantly, all this is achieved without the music appearing in any way obvious or contrived. It is, once again, so very, very natural.

Here's a player capable of throwing open a very wide and deep soundstage. But instead of simply stretching the fabric of the music it manages to pull out all those subtle inflections, the murmur of a bass guitar, the gentle decay of piano or the shimmer of a hi-hat. All those elements, in fact, that contribute to the atmosphere and ambience of a recording, sustaining the generous soundstage with a natural, captivating vibrancy.

'The 965BX is capable of reaching down and drawing out the deepest bass while also soaring to the highest treble with astonishing poise and control'

There's a restyled remote control for instance, new index skip keys and even a coaxial digital output round the back. Best of all, Rotel has now beefed-up the player's output from one volt to the standard level of two volts. This makes comparison between the new Rotel and other CD players rather easier when it comes to the crunch at your hi-fi dealer.

Personally, however, I don't think this latest Rotel need fear much serious competition. It's not just good – it's the most captivating integrated player I've heard below £1000. And as you may know, I've heard a great deal of 'em!

Paul Miller

BEST POINT natural sound
WORST POINT no 'phone input

SPECIFICATIONS
Type integrated
Outputs fixed and digital (coax)
Processor PDM Bit Stream
Remote yes

TESTED WITH
Deltec 50S pre/power
Snell Type JII speakers

RECORDINGS USED
Christy Moore: Smoke and Strong Whiskey (Newberry 50-99161-000221)
Yello, Baby (Mercury 848-791)

RATINGS

Value for money	★★★★★
Performance	★★★★★
Build quality	★★★★☆
Compatibility	★★★★★
Overall verdict	★★★★★

BEST BUY

Devastating...effortless...touch of the high life...what do you call a CD player that literally screams quality at you from beneath its silky black exterior? Our Best Buy winner this year — the Rotel RCD-965BX — has shed all but the bare essentials in single-minded pursuit of a sound that sets some extremely tough standards

What Hi-Fi Awards, 1991

Selected Rotel RCD-965BX Stocking Dealers

ALABAMA
Campbell Audio & Video
(205) 539-9806
ARIZONA
Sounds Like Music
(602) 993-3351
CALIFORNIA
Beverly Hills Audio
(213) 276-2001
Catania Sound
(707) 526-7555
Musical Images
(209) 449-0707
Optimal Enchantment
(213) 393-4434
Recycled Stereo Plus
(408) 425-7587
Sound Distinction
(415) 944-4740
Sound Goods Inc
(415) 949-4300
Stereo Plus
(415) 861-1045
COLORADO
Audio Alternative
(303) 221-1496
Mountain Music
(303) 949-5060
Sound Hounds
(303) 722-3200
The Stereo Image
(303) 442-2166
CONNECTICUT
Robert's Audio Video
(203) 442-5314
FLORIDA
Architectural Audio Inc
(305) 477-1819
Audio Center Inc
(305) 566-0233
Audio Visions
(813) 871-2989
Sound Components Inc
(305) 232-8848
Sound Terrific Inc
(813) 538-2266
GEORGIA
Audio Solutions Inc
(404) 381-0778
Music Audio
(404) 565-2205
ILLINOIS
Audio Consultants
(708) 864-9565
Paul Heath Audio
(312) 549-8100
Pro Musica Inc
(312) 883-9500
Select Sounds A/V Inc
(708) 717-1100
The King Stereo
(217) 523-5656
INDIANA
Three Rivers Audio Co
(219) 422-5460
Tone Studio
(317) 257-0601
KANSAS
Audioport Ltd
(913) 341-2222
Golden Stereo
(913) 648-3750
KENTUCKY
Musical Images
(502) 339-9000
LOUISIANA
Wilson Audio
(504) 866-3457
MAINE
HiFi Exchange
(207) 781-2326
MARYLAND
Myer-Emco
(301) 921-0700
Rayco Sound Inc
(301) 840-0747
Sound Scapes
(301) 889-1134
Soundworks
(301) 589-1191
MASSACHUSETTS
Goodwin's Audio
(617) 734-8800
Pres Speakers
(413) 247-3349
Tweeter, Etc
(508) 777-5100
MICHIGAN
Almas Hi Fi Stereo
(313) 584-1860
Jemstone Audio
(517) 332-1230
MINNESOTA
Audio Perfection
(612) 866-0083
NEW HAMPSHIRE
Audio Ensemble
(603) 886-4742
NEW JERSEY
Audio Nexus
(908) 277-0333
Hitech Stereo & Video
(908) 542-3334
NEW YORK
Accent on Music
(914) 242-0747
Alpha Stereo
(518) 561-2822
Audio Classics
(607) 865-7200
Audio Visions Hightech
(516) 661-3355
Ears Nova Hi Fi
(516) 466-5674
Esoteric Snd Systems
(516) 689-7444
Fairport Soundworks Inc
(716) 264-0410
Innovative Audio
(718) 596-0888
Island Audio
(516) 673-1124
New Paltz Audio
(914) 255-6004
Park Place Audio
(212) 964-4570
Square Deal Radio & TV
(516) 475-1857
Stereo Exchange
(212) 505-1111
NORTH CAROLINA
Audio Advice Inc
(919) 881-2005
OHIO
Audible Elegance
(513) 793-3788
Audio Encounters Inc
(614) 766-4434
Home Ent Systems Inc
(216) 381-6700
OKLAHOMA
K-Labs Premium Audio
(918) 665-1113
OREGON
Corner Audio
(503) 227-1943
Northwest Audio Labs
(503) 753-0472
PENNSYLVANIA
The Audio Gallery
(412) 521-9500
David Mann Ltd
(215) 922-3000
Sound Service Co
(215) 725-1177
PUERTO RICO
Novo Audio
(809) 723-8687
RHODE ISLAND
Ocean State Audio
(401) 521-1140
SOUTH CAROLINA
Sound Advice
(803) 798-9150
Wise Audio
(803) 288-4293
TENNESSEE
Cumberland Audio Group
(615) 297-4700
TEXAS
Preston Trail Audio
(214) 248-9104
The Sound Wave
(806) 792-7299
VERMONT
City Stereo
(802) 863-4372
Scientific Stereo
(802) 257-5855
VIRGINIA
Gifted Listener Audio
(703) 818-8000
Preferred Sound Ltd
(804) 296-5696
Silvermans
(804) 792-6946
WASHINGTON
Hawthorne Stereo
(206) 881-3916
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Few players offer this sort of 'you-are-there' realism, but it is unprecedented for an affordable model to scale these heights. More than just the best in its category, it represents a benchmark to which other products should aspire

Rotel is pleased to be able to reprint the entire reviews from *Hi-fi Choice* and *What Hi-fi/High Fidelity*, both of these British magazines can now be bought in America. We know from our mail bag that many readers would like to be able to see where particular product "quotes" originate, so we have obtained permission to reproduce two reviews from Britain's largest circulation magazines.

Rotel anticipates reprinting more full reviews on Rotel products from other European publications. We hope this will give you, the reader, a greater perspective on editorial styles and another authoritative opinion upon which to judge Rotel.

Hi-fi Choice is edited by Andy Benham and published by Dennis Publishing. Each month the publication takes a detailed, in-depth look and listen to 25-30 competitive units from the audio industry. *Hi-fi Choice* is an invaluable impartial guide to selecting the best Amplifiers/Speakers/Tuners/CD players, etc.

Subjective performance evaluation is carried out by a carefully organized listening panel who listen blind. Panels of listeners are chosen from the trade and industry. They record their views unaware of model or origin, all they know is the price grouping they listen to. Preferred models are selected as "Best Buys."

All products submitted for review are rigorously measured by qualified electronic engineers to establish the true performance figures.

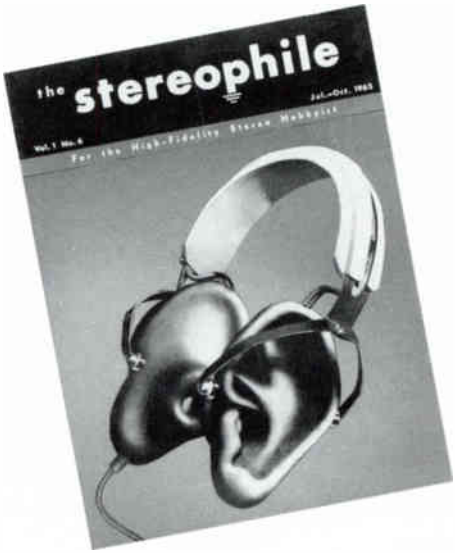
High Fidelity is part of Britain's biggest audio magazine *What Hi-fi* and is published by Haymarket Publishing. *What Hi-fi* contains Britain's hottest hi-fi buying guide, all the news and information about current hi-fi trends in Europe together with up to the minute reviews.

For a wealth of information about audio in Britain, multiple "Supertest" reviews and recommended system combinations, *What Hi-fi* and *High Fidelity* are unrivalled.

Rotel RCD-965BX

Rotel of America, P.O. Box 653, Buffalo, NY 14240 1-800-387-5127

IT WAS 30 YEARS AGO TODAY



We continue our celebration of 30 years of continuous publication by featuring articles by J. Gordon Holt from the early days, including a guide to review terminology and his snapshots of record-company "house sounds" from Vol.1 No.8, cover-dated August 1964. Incidentally, the cover of Vol.1 No.6 (pictured above) generated howls of protest from readers, including that from Mr. Bradley reprinted this month, leading Gordon to conclude that "Audiophiles, it seems, do not *like disembodied ears."*

A popular feature in our first issues was the final-page graph or nomogram. This month's potpourri includes the graph from Vol.1 No.7, which examined the fundamental relationship between a sound's frequency and its wavelength, a relationship that remains as true today as it was in 1965. —JA

REPORT DIVINATION

We have, on occasion, heard audio enthusiasts complain that test reports in other hi-fi publications are useless because they don't come right out and label components good, bad, or indifferent. Not so, we maintain. It *is* possible to divine the true feelings of equipment reviewers in other publications through their use of certain carefully chosen key phrases. For the benefit of those of our readers who wish to glean opinions from other equipment reports, then, we append a short glossary of equipment report doubletalk.

"A fine piece of equipment."—I can't find anything specific to criticize, but I don't like it.

"Worthy of consideration."—This is really pretty mediocre.

"Worthy of serious consideration."—One of the best I've ever come across.

"Among the very best."—Absolutely and indubitably the best available.

"A nice component for the money."—A terrible component, but it's just what you deserve if you aren't willing to pay for good equipment.

"Its sound is quite rich."—It is muffled and boomy.

STAX® FREE COMPACT DISC OFFER!

The Lambda Signature is the benchmark earspeaker by which all other headphones are judged. The Signature employs the most accurate acoustical transducer in the world today. That is why the Lambda Signature reproduces all of your music with perfection and grace.

Stax binaural recordings capture the sensation of ambience present during original performances. The sensations are recorded live in Europe, digital, and employ sophisticated dummy head recording techniques, to ensure natural timbre and the most realistic sonic perspective ever produced. The results of this recording technique will put you in that listening environment.

Stax would like to offer the "being there"experience of binaural compact disc recordings to you. Any audiophile purchasing a Lambda Signature/SRM-T1 earspeaker system from any authorized Stax dealer listed is entitled to receive eight free AudioStax binaural compact discs. If you purchase the SRE-17 Signature Extension Cord along with Lambda Signature System, you can take one additional free binaural disc selection.

This free binaural software promotion is valid thru May 31, 1992.

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Arizona
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Audio by Design/Costa Mesa
Audio Visions/Santa Barbara
Beverly Hills Audio/Beverly Hills
Century Stereo/San Jose
G N P. Audio/Pasadena
Precision Audio/Moorpark
Reference Audio Video/Torrance
Sound Factor/Encino
Sounding Board/Berkeley
Stereo Design/San Diego
Systems Design/Redondo Beach
Western Audio/Palo Alto
Wilson Audio/Woodland Hills
Colorado
Listen Up/Denver
Conneticut
Take 5 Audio/New Haven
Florida
Exotic Sound/Miami
Sound Advice/Dania
Sound Components/Miami
Hawaii
Audio Direction/Honolulu
Iowa
Hawkeye Audio/Iowa City
Idaho
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Paul Heath Audio/Chicago
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Masachusetts
Pro Music Systems/Boston
Marvland
Absolutely Sound/Rockville
Michigan
Audio Advisor/Grand Rapids
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Minnesota
Audio Perfection/Minneapolis
New Jersey
Audio Nexus/Summit
CSA Audio/Upper Montclair
Sound City/Kinnelon
New Mexico
Sound Ideas/Albuquerque
New York
Grand Central Radio/New York
Innovative Audio/Brooklyn
Lyric Hi Fi/New York
Sound by Singer/New York
Stereo Exchange/New York
Ohio
Hoffman's House of Stereo /Warrensville
Progressive Audio/Columbus
Pennsylvania
Hi Fi House/State College
Soundex of Willow Electronics /Willow Grove
South Carolina
Read Brothers Stereo/Charleston
Tennessee
Cumberland Audio/Nashville
Texas
Central Audio Systems/Austin
Dallas Audio Concepts/Dallas
Houston Audio Concepts/Houston
Virginia
Gifted Listener/Centreville
Wisconsin
Salon One/Wisconsin Rapids
University Audio Shop/Madison

"It is somewhat crisp-sounding."—It is unbearably shrill.

"Its sound is undistinguished, which of course is true of live music."—I don't like it.

"Some listeners may prefer it to most competing units."—I don't like it.

"Musically-oriented listeners will like it."—I like it.

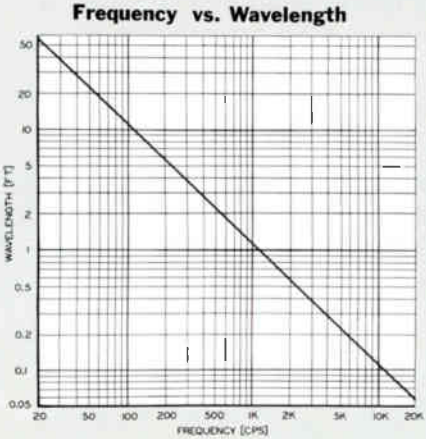
"This would be a fine component, were it not for that one little shortcoming."—It stinks. —JGH

STEREOPHILE'S 1964 RECORD COMPANY RATINGS

Every record company turns out an occasional lemon and an occasional masterpiece, and most of them manage to produce passable discs most of the time. Some, however, have an unusual record for producing substandard or better-than-average discs, and it is on the basis of each firm's average output that we have prepared the following list of record ratings, with record brands listed in order of descending quality. . .

BBC Broadcast Transcriptions: Without a doubt the most realistic-sounding, musically natural recordings we have heard. Extremely wide dynamic range, full frequency coverage, and a minimum of audible gimmickry. Some of these have set standards that no other commercial discs have approached. Unfortunately, they are available only to radio stations; consumers can't buy them.

FREQUENCY VS. WAVELENGTH



Sound waves travel through air at a speed of about 1100 feet per second, so each compression wave of a 1100Hz sound will follow 1′ behind the preceding compression wave. Thus, a 110Hz sound will have a wavelength of 10′, and an 11,000Hz sound will comprise waves 1/10 of a foot long. The wavelengths of other audio frequencies may be read from the graph above.

In a multi-way loudspeaker system, drivers that are electrically in phase may produce *acoustical* misphasing if the sound from one driver unit must travel farther to the listener than the sound from another. If the difference in path length equals one half of the wavelength of the crossover frequency, the tweeter's rarefaction waves will coincide with the woofer's compression waves, causing cancellation. Multi-way systems should be constructed so that all driver-element diaphragms are the same straight-line distance from the listener's head.

In the listening room, sounds reflecting from between parallel walls set up standing waves at frequencies which are related to the distance between the walls, producing zones of exaggerated pressure and zones of reduced pressure in the room. The deepest standing wave occurs at that frequency whose wavelength is twice the distance between the reflecting walls which are farthest apart. Other standing-wave resonances occur at multiples of the lowest frequency resonance, and these combine with the standing-wave patterns of other room boundaries to create a complex pattern of "hot spots" and "dead spots" at different frequencies throughout the listening area. Judicious loudspeaker placement and acoustical treatment can usually minimize standing-wave response irregularities, but if two or more room dimensions are the same, the augmented standing-wave patterns are almost impossible to smooth out. The best possible listening room will be dimensioned in a ratio of 1 to 1.25 to 1.6, as this will give the broadest, smoothest distribution of standing-wave patterns.—**J. Gordon Holt**

English Columbia/EMI: Similar in overall sound to the BBC discs, but with rather less dynamic range. Quiet surfaces.

Vanguard: Natural, musical-sounding, with very wide frequency range and fairly wide dynamics. Good surfaces, few tracing problems. Most Vanguards have an easy, ungimmicked quality that allows the listener to enjoy the music without having his attention continually drawn to the fact that he is listening to a "hi-fi" recording.

Deutsche Grammophon: Generally good balance, with nice sense of perspective and wide frequency range. Dynamic range moderate (comparable to domestic Columbia). Surfaces very good, generally clean tracing.

London: Some high-end tip-up and low-end boost, with obvious but not usually offensive evidence of multimiking. Very wide dynamic range; widest dynamics of any commercial firm. Full-range, very slickly recorded, not entirely natural-sounding but, in general, musically appropriate. Very quiet surfaces.

RCA Victor: Until Dynagroove came along, Victor was close to the top of the list for sound quality among US manufacturers. Some sizzle at the high end of most discs, but sound was generally natural and rich, with good low-end range and fairly wide dynamics.

Dyer-Bennet: This label must be included here for the simple reason that Ye Editor is responsible for the mastering and processing of folk-singer Richard Dyer-Bennet's records.

All of Dyer-Bennet's discs, from Number 1002 to the latest, were taped and disced "straight," without any tonal compensation of any kind (except for RIAA equalization). Differences that exist between different discs stem from the use of different microphones, different recording locations, and different disc mastering services. The latest two releases—Numbers 9 and 10—have the best sound on them, although they are quite dissimilar. Number 10 is probably closest to being a perfectly natural representation of the singer's voice.

Rittenhouse: This small, shoestring operation has produced only two discs to date, one on mono only, the other on mono and stereo. Neither one has fully captured the sound of the master tapes (which we had an opportunity of hearing), but they both have a sense of spaciousness and openness that indicate that the producers are definitely trying to make honest, natural, musical-sounding discs. The stereo disc (of Dubois' *Seven Last Words of Christ*) has a more natural illusion of depth and spaciousness than any commercial disc we have heard for a long time.

Kapp: Brilliant, razor-sharp sound, but surprisingly natural nonetheless. Fairly wide dynamic range, good surfaces, realistic stereo illusion. Recordings are larger than life, but appropriate to the music.

Westminster: The first releases from this company were excellent on all counts. Later efforts, particularly the more recent stereo releases, have been very variable, ranging from quite natural but rather lacking in depth, to shockingly gimmicked, with sudden and drastic manipulations of instrumental balance.

Surfaces generally good, tracing generally clean, overall frequency range good but not spectacular. Dynamics about on a par with domestic Columbia.

Command Classics: Super-high-powered sound, but not very natural. Low bass attenuated, highs hard and wiry, with frequent tracing problems. Little or no sense of instrumental perspective. Excellent surfaces.

Mercury: Rather close-up, hard sound, with slightly steely high end and rolled-off low end. Wide dynamic range (almost comparable with London's discs), quiet surfaces, and nearly always some tracing problems, particularly in inner grooves.

Everest: A few of these are excellent, but many are plagued with very severe distortion, which sounds like a combination of tracing problems (due to poor cutting or processing) and plain, ordinary electrical overload distortion. Wide dynamic range, good surfaces, but generally hazy, grainy sound despite razor-sharp highs.

Domestic Columbia: Very variable. The best are rich, warm, and very natural-sounding, with fairly respectable dynamic range. The average is shrill, steely, and plagued with shockingly conspicuous manipulations of microphone balances. Surfaces only moderately good.

Angel: Much the same as Capitol, but with good sense of perspective. Surfaces generally good.

Capitol: Relatively limited dynamic range, thin low end, and an artificially brilliant,

steely-sounding high end, with tracing problems. Surfaces variable. Orchestral sound has no perspective.

Vox: This firm has the dubious distinction of having never produced a really good recording. Stereo illusion is often good, but all Vox discs we have heard have had a grainy, veiled quality and limited dynamic range.

RCA Victor Dynagroove: These have varied from horribly shrill and distorted to quite pleasant-sounding, but none of them has ever come close to re-creating the sound of a live orchestra. Surfaces good, tracing clean (most of the time), and dynamic range almost nonexistent. —J. Gordon Holt

ANATOMICAL ALLERGY

Sirs:

Your cover on the July–Oct. 1963 issue was the most disgusting thing I've ever laid eyes on. This is one copy of *The Stereophile* that isn't going to grace *my* coffee table. A few more covers like that and I for one am going to cancel my subscription.

W. Bradley
Syosset, NY

What do you have against ears? —JGH

DOWN WITH EFFICIENCY

Just received my first copy of *The Stereophile*, and it caused a riot and complete work stoppage in our office and lab. You should have a "Caution—Do Not Open Except In Complete Seclusion" sticker on the envelope. The next time I'll be prepared. Great stuff—you pull no punches!

A. L. Schmidt
Las Vegas, NV

We're glad to hear you enjoyed your first issue, and are gratified that The Stereophile *did its bit, however small, to reduce office efficiency.* —JGH

WRONGHEADED REVIEWS

I've bought several recordings on the basis of your recommendations, and while I suppose I have to agree with you about their sound, I am damned if I agree about the interpretations.

You seem to think that everything must have "fire and drama" to be worth listening to. There is more to music than unbridled emotionality, and I for one prefer more restrained, introspective readings.

I still like the rest of the magazine—it is something that's been sorely needed for a long time—but your record reviews are hopeless.

D. L. Winters
Brooklyn, NY

We can't espouse "fire and drama" for Claire de Lune, *but we do like to hear it when a work calls for it. To us, far too many recorded performances lack spontaneity, and it is this that we seek, rather than any specific emotional qualities. At least our record reviews are fairly consistent in interpretive viewpoint, so any reader can, by trying a few of the recordings we recommend, ascertain whether or not he agrees with us and can fairly safely trust (or distrust) our future recommendations.* —JGH

HI-FI DISCS

Bravo for your article about the lousy sound on commercial recordings. I am damned happy to see someone finally speaking up about the highhanded tactics of these record companies that purvey all that sonic garbage under the name of "high fidelity."

I am afraid, though, that we perfectionists are too small a minority to be able to bring any pressure to bear on the record makers. The only thing they understand is ledger sheets, and there just aren't enough of us to influence their sales measurably.

Roy Hume
Denver, CO

A happy consumer almost never writes letters to express his appreciation. So a few thousand letters from dissatisfied ones are likely to look like a significant groundswell of opinion, particularly to companies as conscious of their public image as the record manufacturers.

Again, we urge our readers to write to the erring record firms and give 'em hell, politely but firmly. —JGH

FEELTHY FI

For the benefit of those sheltered souls who haven't already heard this, we cite the report of the tourist who, on returning from a vacation in France, was accosted by a customs inspector who asked bluntly, "Are you bringing in any pornography?" To which said tourist allegedly replied, "Heck no, I don't even own a pornograph." —JGH

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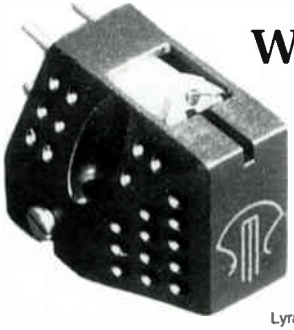

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Bold listings available in New York exclusively at Sound By Singer.

Stereophile's Second Test CD

Back in the Spring of 1990, Stereophile *introduced its first Test CD. Featuring a mixture of test signals and musical tracks recorded by the magazine's editors and writers, it sold in large numbers—around 50,000 had been produced at last count. Even as we were working on that first disc, however, we had plans to produce a second disc that would expand on the usefulness of the first and feature a more varied selection of music. The result is our Test CD 2, introduced this month for just $7.95 plus $2 postage and handling (see the advertisement elsewhere in this issue for ordering details). With a playing time of over 74 minutes, the new disc should prove an invaluable tool to help audiophiles optimally set up their systems and rooms by ear—and the music's pretty good, too!*

—JA

TRACK INFORMATION

[1] Channel Identification (DDD) **0:37**
Left then Right, John Atkinson (Fender Precision bass guitar), with spoken introduction by Richard Lehnert
[2] Channel Phasing (DDD) **0:46**
Out-of-phase, then in-phase, John Atkinson (Fender Precision bass guitar fitted with Rotosound round-wound strings), with spoken introduction by Richard Lehnert
Instrument amplifier: Fender Bassman 50, fitted with ARS tubes
Microphone (voice): B&K 4006 omnidirectional
Microphone preamplifier: EAR 824M
Recorder: Manley Analogue to Digital Converter, Aiwa HD-S1 DAT, AudioQuest Lapis balanced interconnects

No matter how purist the engineer's approach, all recordings are at least one step removed from the real thing in that the sound has to be picked up by a microphone. An electric instrument, however, allows the opportunity of recording its electrical output without any original sound being produced. In this way, the low-frequency phase integrity of the original "sound" would be preserved absolutely, something audiophile playback systems almost never have to deal with. The result is a reference sound with a high peak:mean ratio, meaning that even though it requires a system with a large dynamic-range capability to be passed through without distortion, it doesn't sound very loud.

JA therefore decided to use a Fender Precision bass guitar for this disc's traditional channel and phasing checks. He ran off a couple of riffs, recording the instrument's output in mono in three different ways: taking a direct feed from the instrument; taking a tap from the Fender Bassman amplifier's output terminals; and, as a check, miking the speaker cabinet. The second version was the one which ended up on the CD, the amplifier's tone controls being used to add a degree of treble bite to the sound and boosting the level of the instrument's bottom octave but not otherwise significantly changing its fundamental character.

Fig.1 shows the first 4s of the final "pop" on the instrument's E string in Track 2, produced by slapping the string hard with the right thumb, while fig.2 shows the first 40ms (1/25s). (The scale has been expanded in fig.1, cutting off the top of the initial transient, to show more clearly the way in which the note's envelope changes as it decays.) You can see that the waveform starts with an almost square, positive-going pulse, running nearly all the way up to the 0dBFS level. This enharmonic, positive-going click is the sound of the string hitting against the fretboard, and is followed by a complicated waveform, the low-frequency (41.2Hz) fundamental being overlaid with considerable and slowly changing amounts of higher harmonics (each harmonic has a frequency an integer—whole number—multiple of the fundamental: 2x, 3x, 4x, 5x, etc.).

The Fender Precision bass, tuned one octave lower than the lower four strings of the regular guitar, was introduced in 1951 by the late Leo Fender as a more portable, less unwieldy substitute for the double bass or bass fiddle. In the ensuing 40 years the Fender has solidly established itself in virtually every field of music other than classical, its combination of percussive transients coupled with a unique, woody tone becoming one of the foundation stones of rock music. JA bought the instrument used on these tracks second-hand in 1968; it served him faithfully during

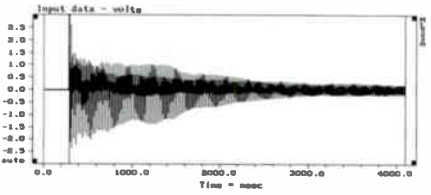


Fig.1 Fender Precision bass guitar, E-string transient at end of Track 2 (4s time window)

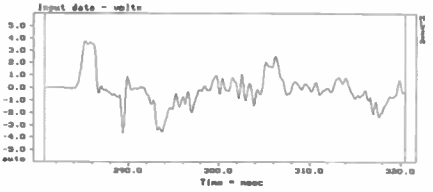


Fig.2 Fender Precision bass guitar, E-string transient at end of Track 2 (40ms time window)

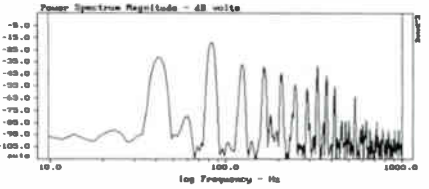


Fig.3 Fender Precision bass guitar, spectrum of E-string transient during initial decay period (10Hz–1kHz)

his career as a session musician. It was actually made in 1964, before Fender was bought by CBS, and has been re-fretted twice in that time. (The wide vibrato JA uses on these riffs is anathema to long fret life, particularly when the bass is fitted with "round-wound" strings.)

Despite what might be thought, the frequency spectra of electric (as opposed to electronic) instruments is complex. Fig.3 shows the spectrum of the low E string of the Fender bass, taken directly from the instrument's output. The fundamental frequency is 41.2Hz—the left-most peak—but the second harmonic at 82.4Hz is actually 11.8dB higher in level! (You can also see that the bass, being a high-impedance, inductive source, picks up a little 60Hz hum—the small peak at –80dB between the fundamental and second harmonic.) Harmonics sticking up above the FFT analyzer's noise floor can be seen all the way up the 17th at 700Hz, which lies 65dB below the fundamental level; as with any instrument, it is the precise ratio of the harmonics, detailed in Table 1, that gives the Fender bass its characteristic tone.

It is important for a hi-fi system to be able to pass the harmonics of recorded sounds with the ratio of their levels, which corresponds to the "timbre" of the sound, intact. As Ron Streicher and F. Alton Everest say in their 1992 book, *The New Stereo Soundbook*, "Preservation of spectrum is essential to the presentation of timbre. . . to maintain the illusion for the listener."[1]

Later along in this CD, you'll be able to

1 Published by TAB, this book is an excellent guide to the pros and cons of the various microphone techniques used on this CD.

Table 1
Fender Precision bass guitar, round-wound strings:
Harmonic Spectrum of open E string (fundamental = 41.203Hz)

Harmonic	Note	Frequency		Level/Percentage of fundamental	
1st	E	41.2Hz		0.0dB	100.00%
2nd	E	82.4Hz		+11.8dB	390%
3rd	B	123.6Hz[1]	(123.471Hz)	–5.8dB	51.5%
4th	E	164.8Hz		–7.8dB	40.8%
5th	G#	206Hz	(207.652Hz)	–13.3dB	21.5%
6th	B	247.2Hz	(246.942Hz)	–23.0dB	7.1%
(Middle C, the note on the ledger line between the bass and treble staves, has a frequency of 261.626Hz)					
7th	D	288.4Hz	(293.665Hz)	–26.6dB	4.6%
8th	E	329.6Hz		–7.3dB	43.0%
9th	F#	370.8Hz	(369.994Hz)	–15.8dB	16.6%
10th	G#	412Hz	(415.305Hz)	–24.7dB	5.7%
11th	A	453.2Hz	(440Hz)	–52.6dB	0.23%
12th	B	494.4Hz	(493.883Hz)	–52.4dB	0.24%
13th	C#	535.6Hz	(554.365Hz)	–32.6dB	2.35%
14th	D	576.8Hz	(587.33Hz)	–59.5dB	0.1%
15th	D#	618Hz	(622.254Hz)	–51.9dB	0.26%
16th	E	659.2Hz		–58.8dB	0.12%
17th	F	700.4Hz	(698.456Hz)	–64.5dB	0.06%

1 Musicians will notice that these are *not* the frequencies of the notes in the Equal Tempered Scale, which divides the octave into 12 equal intervals, the frequency of each being that of the previous note multiplied by the 12th root of 2. (These frequencies are shown in brackets.) The 7th, 13th, and 14th harmonics, in particular (D, C#, and D), are noticeably flat compared with the equivalent note produced by equal temperament tuning, while the Bs are all slightly sharp. A stretched string, knowing nothing of mathematics, gives a "natural" harmonic series where each note is an integer multiple of the fundamental. Once you've heard music played with such a "natural" tuning, equal temperament will always sound out of tune. So why doesn't everyone use natural tuning? Because you need to retune your instrument for every key you need to play it in, which is hardly convenient for music composed after the time of Scarlatti.

hear how much of each of various kinds of distortion are audible. It's not giving any secrets away to reveal that second-harmonic distortion—*ie*, the distorting component is adding a tone one octave above every note of the music—is inaudible even in large quantities. Fig.3 shows you why: a real instrument like the bass guitar already has large amounts of second harmonic present in its spectrum; adding a little more can hardly be expected to change the instrument's basic tonal quality. But because adding even small amounts of high-order harmonics changes the ratio of harmonics—hence the timbre of the instrument—by a relatively large amount, they will be more audible.

Incidentally, because distortion harmonics are "natural" harmonics—see Table 1—with the exceptions of the second, fourth, eighth, sixteenth, etc., they will not be in tune with the same notes occurring in the music, assuming it has been played on instruments with equal-temperament tuning. This might well lead to a more-than-expected increase in "graininess" to the sound of the distorting device.

MUSIC TRACKS

[3] Acoustic Drum Solo (DDD) 3:37
Russ Henry (Yamaha drums)
[4] Acoustic guitar solo (DDD) 3:07
Gavin Lurssen (steel-strung Martin D-28 guitar)
Recording Venue: David Manley Recording Studio, Chino, CA
Recording Date: November 9, 1991
Recording Engineers: Robert Harley, David Manley
Microphones: Manley Gold Reference Stereo in crossed, coincident figure configuration
Recorder: Manley Analogue to Digital Converter, Panasonic 3700 DAT

Robert Harley writes that when the idea of making a second *Stereophile* Test CD was proposed, he "jumped at the chance to record some fresh tracks. The plan was to record acoustic instruments in a fairly live studio with a single pair of microphones and a very pure and simple signal path. No artificial reverberation, no 'accent' mikes, no signal processing, no equalization, and no compression. In short, I wanted to capture the natural sound of the instruments in the room without electronic 'enhancement'—the engineer as transcriber rather than creator. The session would also give me the opportunity to describe and photograph the performers' and microphones' positions in the room, giving Test CD listeners a visual perspective of the sounds they were hearing.

"There was no better place to do this than David Manley's recently built recording studio a few miles from the Vacuum Tube Logic factory in Chino, California. Everything about the studio was ideal for this project, from the room's acoustic design to the recording signal path. The recording room, which is 29′

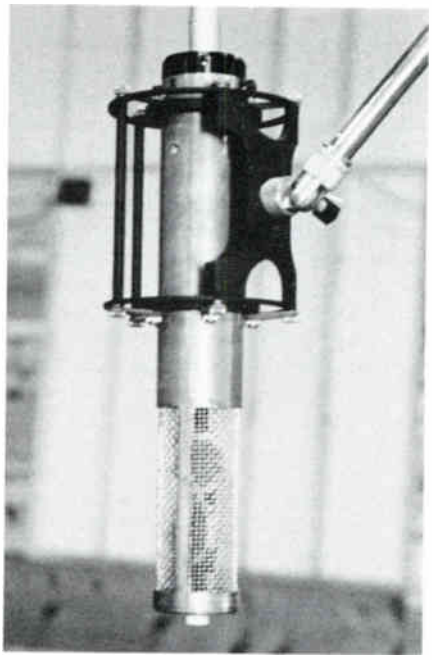
Russ Henry sits at the drums


Gavin Lurssen

wide, 38′ long, and has a 12′ ceiling that peaks at 17′, was designed by David for making purist recordings. The room is *very* live as recording studios go, with wood walls and ceiling. The four side walls form low-frequency slat absorbers (60% of their area) to control the low-frequency reverberation time. Solid construction and double-doors provide acoustic isolation.

"Although the room is superb, what really sets this studio apart is the microphones and signal path. Every piece of electronics in the signal chain is tubed and designed by David—microphones, mixer, monitoring electronics, and analog tape machine electronics. The microphone used in these two recordings was the Manley Gold Reference Stereo (tracks recorded with the mono version, the Gold Reference, weren't included on the Test CD). Both types were built from scratch—including having the 3μm diaphragms sputtered with gold. The dual-capsule stereo microphone was used in its figure-8 pattern, in a Blumlein (vertically coincident crossed figure-8) configuration. Inside the stereo microphone are eight triode tubes (in four envelopes), which amplify the microphone level signal to line level. The microphone preamp is thus *in* the microphone. This technique not only obviates the need for a transformer in the microphone, but also eliminates the usual practice of sending tiny microphone-level signals (a few millivolts) down long cables to the microphone preamp, usually found in the recording console. The microphones are mounted in upside-down microphone stands and hung on beams suspended from the ceiling. The entire beam assembly can be raised and lowered by a pulley system. This arrangement keeps cables off the floor and prevents footfalls and other structure-borne vibration from getting in the mikes.

"David's recording console is very different from those found in today's recording studios. Modern consoles are usually the size of a pool table and covered by many hundreds of buttons and knobs—with many hundreds of corresponding components underneath. These often include dozens of op-amps (5532s are very popular), cheap capacitors, carbon resistors, and yards of pcb traces—all powered by supplies with poor isolation and regulation. By contrast, David's console is a small rectangular box the size of



David Manley's stereo microphone

a preamp with 10 knobs to adjust the levels of up to 10 microphones, two master level controls, and monitoring level adjustments. The all-tube circuit is based on the VTL Ultimate Preamplifier and uses the new (and very expensive) MIT capacitors. The mixer's stereo output drives the Manley Reference A/D converter (which in turn drives two DAT machines) and the input of a vintage Studer C37 ½″ analog tape machine retrofitted with David's custom tubed record and playback electronics. Also on hand is a Mitsubishi X-86 HS open-reel digital 2-track. The 'HS' stands for high sampling rate (96kHz), and the machine has 20-bit A/D converters, 20-bit storage, and 20-bit D/A converters. We chose not to use the Mitsubishi for this session: besides having to throw away the four extra bits of resolution when making a 16-bit CD master tape, we would have had to sample-rate-convert from 96kHz to the CD's 44.1kHz, a major sonic compromise. When making the CD master tape, we used the DAT masters as the source.

"The electronics, tape machines, and monitoring system are in a motor home parked next to the studio. Large windows in each permit visual interaction between the musicians and engineer. This motor home

arrangement has advantages: greater acoustic isolation between the recording room and control room, and easy transportation of these special electronics to a concert hall for on-site recording. All the recording electronics are powered by 240VAC instead of 110V.

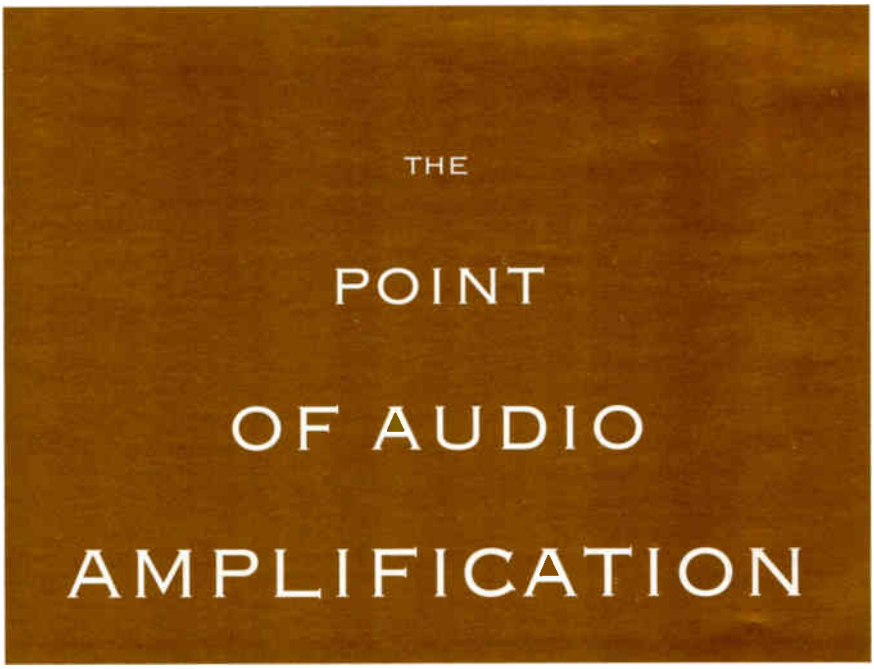
"David has installed a mastering room next door and is now rebuilding several Scully lathes. These lathes, with their new custom air-bearing turntables and modified cutting heads, would be almost unrecognizable to their designers. Having a mastering room next to the studio provides a terrific opportunity: cutting direct-to-disc records. The entire facility was built to keep purist recording alive and to make LPs and CDs for release on VTL's ViTaL label.

"I was particularly eager to record drums using purist techniques. Nearly all my experience as a recording engineer has been in multi-track studios where the drums are close-miked (using as many as a dozen microphones), equalized, gated, reverb'd, and spatially positioned with the recording console's pan pots.[2] I had previously recorded drums with as few as three or four mikes (stereo overhead pair with individual mikes on the kick drum or kick and snare drums), but never by themselves in a live room with just two mikes.

"When I listened to the drums before putting up any microphones, I was encouraged; this was one of the best-sounding kits I'd heard. Drummer Russ Henry had spent the previous week installing new heads and tuning the studio's house Yamaha kit. No matter how good the room, microphones, electronics, or recording techniques, the secret to getting good drum sounds is to use good-sounding drums.

"After some experimentation with microphone placement (and lots of experimentation with placement of the drums in the room), the crossed figure-eight pair ended up 2½' above, and slightly forward of, the drummer's head. The stereo mike was behind the drums rather than in front of them to achieve a better ratio of drums to cymbals. We recorded several takes with varying levels

2 I was at a session in which the output from each drum microphone triggered preset electronic drum sounds from banks of drum machines. To prevent the sound of one real drum mistakenly triggering the wrong electronic drums, noise gates were put on each microphone. Getting all this to work—including finding the right threshold for each gate—was a *20-hour* ordeal. Do you think anyone was in the mood for making *music* after that? **—RH**



of the spaced omnidirectional microphones mixed in, but, after auditioning the tapes in Santa Fe, JA and I both preferred the greater image specificity and dynamics heard from the crossed figure-eights alone, despite the slightly reduced sense of space.

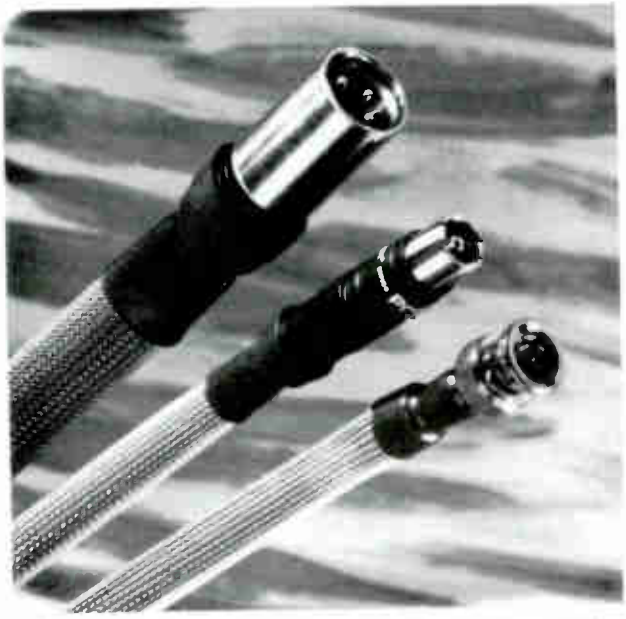
"Old habits die hard; I was briefly tempted to put another microphone on the kick drum to get more punch and impact. I quickly came to my senses; this project was about capturing the natural sound of the instrument in a real room, not creating artificial hype. What you hear is what actually existed in the room. Incidentally, this track should be played back at as high a level as you can manage—live drums are *very* loud. This drum track is a good test of a system's dynamic range, LF extension, image specificity, and ability to differentiate pitch. The various toms should each have a distinct pitch and appear at individual points in space rather than sounding homogeneous."

Because the mikes were behind the drums, the kick drum is recorded with the wrong "absolute phase"—its sound starts with a rarefaction rather than a compression. See if you can hear a difference when you reverse the polarity of the waveform by changing the red and black connections to both loudspeakers.

About the guitar recording, Bob writes that "it was made with the single Manley Gold Reference Stereo microphone (in crossed figure-8 pattern) about 8' from guitarist Gavin Lurssen, who sat in the middle of the studio. Again, the Blumlein technique was chosen over the pair of spaced omnis; image specificity and the impression of the instrument existing independently *inside* the room was far more realistic with the crossed figure-8 configuration. The Martin D-28 guitar should be surrounded by the acoustic, with the room 'lit up' by sharp transient attacks, especially when Gavin hits the strings hard. The guitar had a very wide dynamic range, a quality the recording seems to have captured."

---

[5] Igor Stravinsky: *L'Histoire du Soldat* (excerpt) (ADD) **0:56**
Performers unknown
Recording Venue: Wilmington Music School, Wilmington, DE
Recording Date: 1968
Recording Engineer: J. Gordon Holt
Microphones: two Sony C37 cardioids in ORTF configuration



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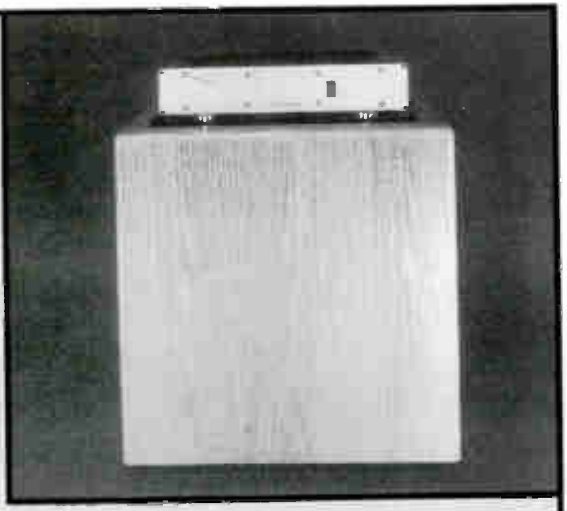

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Digital Transfer Engineer: Robert Harley

"ORTF" refers to a technique devised by the French broadcasting organization (*Office de Radiodiffusion-Télévision Française*) whereby two directional ("cardioid") microphones are angled at 110° and spaced about 7" apart, the average distance between a human being's ears. The two microphones basically encode the directions of the voices and instruments by the different loudnesses they pick up. In itself this would give a very narrow stereo image—"fat mono," one writer described it—but by spacing the microphones apart, a little time information is added which ensures that the image extends across the full spread of the loudspeakers. (Sound reaching the microphones from the left, for example, will reach the left-facing microphone approximately 0.7ms before it reaches the right.) This is but one of a number of "purist" techniques, all of which share the characteristic of being able to capture a "real" soundstage, so that the listener's loudspeakers seem to disappear.

Featuring much smaller forces than the immensely scored ballets which preceded it, *L'Histoire du Soldat* ("The Soldier's Tale") was composed by Stravinsky in 1917. The music illustrates a poem by the French writer Charles Ramuz in which a violin-playing soldier on leave is tempted by the Devil to trade his instrument for a magic book. One thing leads to another: though the soldier at one point wins back his violin from the Devil at cards and marries a Princess, he ultimately loses everything dear to him and ends up in the Devil's thrall. This brief excerpt, featuring the rude sound of the trombone and a mellow trumpet, opens the "Royal March" tableau.

[6] **Sergei Prokofiev:** Flute Sonata in D, Op.94, *Allegro con brio* (AAD) 7:00
Gary Woodward (flute), Brooks Smith (New York Steinway piano)
Recording Venue: Allan Hancock Foundation Auditorium, University of Southern California, Los Angeles, CA
Recording Date: June 12, 1989
Recording Engineer: Kavichandran Alexander (Water Lily Acoustics)
Producers: John Atkinson, Richard Lehnert
Analog tape editor: Hugh Davies
Microphones: two EAR The Mics (prototypes), set to figure-8 pattern, coincident at 90°

Kavi Alexander adjusts his crossed EAR figure-8 mikes during the *Poem* sessions

Brooks Smith and Gary Woodward, as seen by the mikes

Microphone preamplifier: EAR 824M
Recorder: Ampex MR70 ½" open-reel recorder at 15ips
Tape: Ampex 456
Transfer to digital: Bob Katz 128x-oversampling A/D, Ampex ATR-100 open-reel machine
Digital Transfer Engineer: Bob Katz

The tube microphones were approximately 9′ back from the flute, with the piano (its lid on the short stick) around 5′ further back (see photo). The use of a "purist" microphone technique means that on a good system, the image of the musicians should "float" free of the loudspeakers, with the space between and behind them suffused with the somewhat cavernous sound of the empty hall. The flute image should be both very narrow and very stable. If it "wobbles," then possibly strong sidewall reflections of the sound from the loudspeakers, or reflections of that sound from a centrally placed equipment cabinet, are interfering with the way the direct sounds from the loudspeakers reach the listener's ears. The piano should have a slightly "boxy" character compared with the similar Steinway on Tracks 11 and 12, due to the rear wall of the stage, being some 3′ or so behind the instrument. The piano image should extend from half-left (which is where the keyboard is) to half-right.

The finale of Prokofiev's Op.94 Sonata (written in 1943) features Prokofiev's most extravert and playful writing, with a profusion of ornament for the flute and typical percussive effects in the piano part. "The flute is rarely silent, the piano never, and the entire impression is one of sheer exuberance and impetuosity," notes Denis Stevens, while JA loves the heroic broken chords at the start of the second theme. The complete sonata is included on *Stereophile*'s *Poem* album.[3]

[7] Franz Schubert: *Ave Maria* (DDD) **4:35**
Takaoki Sugitani (violin), William "Pat" Partridge (Aeolian-Skinner organ)
Recording Venue: Christchurch Cathedral, St. Louis, MO
Recording Date: October 1990
Recording Engineer: John M. Blaine
Microphones: Three B&K 4006s (black grilles) in spaced-omni configuration, with a Schoeps MK4 cardioid on violin
Microphone preamplifier: Schoeps CMC 5
Recorder: Sony PCM-601ES A/D converter, Sony Beta VCR, transferred in the digital domain to Panasonic 3700 DAT recorder
[8] Traditional (arr. Charlie Caranicas): *St. James Infirmary* (DDD) **3:39**

3 The recording of *Poem* was described in *Stereophile*, Vol.12 No.9, September 1989. As well as Prokofiev's Flute Sonata in D, the LP includes Reinecke's Flute Sonata in E ("Undine"), and the title work by the 20th-century American composer Charles Griffes. *Poem* is available on either LP or CD for $11.95 plus $2 shipping and handling: order from *Stereophile*, LP/CD Department, P.O. Box 5529, Santa Fe, NM 87502.

The Brassworks: Christopher Krummel (trumpet), Christopher Olson (trumpet), Frank Groome (horn), Thomas Vincent (trombone), Dana Hofer (tuba), Darren Saner (percussion)
Recording Venue: Christchurch Cathedral, St. Louis, MO
Recording Date: March 1991
Recording Engineer: John M. Blaine
Microphones: Two Schoeps MK4 omnis in spaced-omni configuration, with a central pair of coincident Schoeps MK4 cardioids, crossed at 90°
Microphone preamplifier: Schoeps CMC 5
Recorder: Sony PCM-F1 A/D converter, Sony Beta VCR, transferred in the digital domain to Panasonic 3700 DAT recorder

Medically retired at a relatively early age, John Blaine is a *Stereophile* reader from St. Louis who has been interested in recording since he bought an Ampex cassette recorder in the '60s to make tapes for his car. The Ampex didn't have Dolby, but it did come with a couple of "terrible" microphones. Friends asked him to record a concert at Christchurch Cathedral, and he has been recording there ever since. He replaced the Ampex first with a Tandberg open-reel machine, then a plethora of digital gear, and its mikes with first Shure dynamics, then AKG D200 dynamics, then finally the mix of B&K and Schoeps condenser mikes he now uses.

"As cathedrals go, Christchurch is quite small, at 140′ by 65′, with a 95′ ceiling," notes John, "but it has a decay time of around 3s. When you're not recording too close to the sidewalls, it gives a wonderful sense of spaciousness, without being so large as to sound swimmy." John positions his mikes "to give the listener a sense of what they would hear in the optimum position in the hall." For this Schubert arrangement, he used three omnis for his main pickup, widely spaced around 50′ from the violinist, who was standing next to the organ console in the gallery with the instrument's pipes around 8′ behind him. To get a better sense of immediacy, John placed a spot microphone, a Schoeps cardioid, about 8′ from the violin. Its level was 30dB down from the main pickup, however. The organ itself, a superb, classically voiced Aeolian-Skinner from 1966, is about 45′ wide and has 77 stops and 67 ranks of pipes, these about 40′ from the main floor of the cathedral.

For the brass recording, John used two Schoeps MK4 microphones, set to a cardioid pattern, coincident and crossed at 90°, coupled with a second pair of Schoepses switched to omnidirectional pickup and about 6′ apart, all four mikes being 20′–25′ back from the ensemble. He chose to use the main pair as crossed cardioids because of their warmer sound, though they ultimately ended up about 10dB quieter than the omnis. John feels that this recording offers "a delicious sense of space." Indeed it does!

[9] J.S. Bach: Trio Sonata BWV 525, *Adagio* (ADD) 5:13
James Johnson (Flentrop organ)
Recording Venue: Busch-Reisinger Museum, Harvard University, Cambridge, MA
Recording Date: 1979
Recording Engineers: Peter W. Mitchell, E. Brad Meyer
Microphones: four Nakamichi CM-700s, two cardioid capsules in ORTF configuration, two widely spaced omnidirectional capsules
Microphone preamplifier: Mystic Valley Audio custom mixer
Recorder: ReVox A77 ¼" open-reel recorder at 15ips, with dbx noise reduction
Transfer to digital: Sony PCM-F1 (modified)
Digital Transfer: E. Brad Meyer & Northeastern Digital Recording
Original commercial release: 1988, *James Johnson Plays Bach*, Titanic TI-162 CD. (Titanic Records, P.O. Box 204, Somerville, MA 02144-0204. Titanic recordings are distributed in the US by Harmonia Mundi USA.) TI-162 was also available as an Ashmont LP.

Harvard's Busch-Reisinger Museum is a small chapel whose stone surfaces produce strong reverberation. The small organ, installed in 1958 by the Dutch company D.A. Flentrop, has a "positiv" rank of pipes (often used for the melody) mounted on the front rail of the Museum's balcony, plus additional ranks of pipes 10′ further back. To obtain an accurate recorded image of this spatial relationship, a semi-coincident pair of directional cardioid microphones was used in an ORTF array. Widely spaced omnidirectional mikes were mixed in at a lower level to enhance the sense of ambience and to reinforce the bass frequencies. (Unlike cardioid microphones, which tend to have a rolled-off bass except when very close to the sound source, omnidirectional microphones have a flat response to single-digit frequencies, in theory even to DC.)

JA chose this track, not only because it is one of his favorite Bach pieces for the organ, but also because of the lovely registration chosen by Mr. Johnson. The organ pipes have an appealing "chiff" or "chirp" at the onset of each note. Peter Mitchell points out that listeners may perceive some of the rhythms as oddly disjointed, because low pedal notes often sound slightly behind (in time) the melodic line. This is an acoustic attribute of

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"tracker" (not electronic) organs: it takes a fraction of a second longer for sound-pressure waves to build up and emerge from the large 8′ and 16′ pedal pipes at the back of the organ than from the small "positiv" pipes in front. This presents an artistic choice to the performer: whether to play the pedals slightly ahead of the beat, in order to make them sound on the beat. Brad and Peter discussed this question with James Johnson; he chooses to play all the notes on the beat, regarding "late" bass as part of the natural character of the organ.

Peter notes that he has also noticed a similar situation in symphony orchestras. He once heard Erich Leinsdorf, in an interview, state a lesson he learned from Toscanini about bass fiddles: they take a little longer than mid-range instruments to develop their tone at full amplitude. So if the conductor wants bass entries to sound exactly on the beat—giving the performance a sense of urgency and momentum—the basses actually have to play slightly ahead of the beat. This, he said, was one of the secrets behind Toscanini's exciting performances.

[10] Mapping the Soundstage (ADD) **1:04**
Larry Archibald (acoustic voice, footsteps, handclaps)
John Atkinson (Cambridge SoundWorks Ambiance loudspeaker)
Recording Venue: Universalist Unitarian Church, Santa Barbara, CA
Recording Date: January 29, 1990
Recording Engineer: Kavichandran Alexander (Water Lily Acoustics)
Microphones: two EAR The Mics set to figure-8 pattern, coincident at 90° and spaced vertically by 2″
Microphone preamplifier: EAR 824M, Cardas microphone cables
Recorder: Ampex MR70 ½″ open-reel recorder at 15ips
Tape: Ampex 456
Transfer to digital: Manley Analogue to Digital Converter, Aiwa HD-S1 DAT, Ampex ATR-100 open-reel recorder, AudioQuest Lapis balanced interconnects
Digital Transfer Engineer: John Atkinson

Before we embarked on the formal sessions for *Stereophile*'s *Intermezzo* piano album, we recorded Larry Archibald "mapping" the soundstage in the church, illuminating the bounds of the acoustic to be later excited by the piano with his footfalls and handclaps (see fig.4). The Blumlein microphone technique, using two figure-8 microphones "crossed" at 90°, accurately captures the directions of soundsources, though the slight degree of vertical spacing Kavi Alexander used somewhat widens the center of the stage.

Larry walks from the far left of the church to the far right, facing out from the altar,[4] a total distance of about 35′. In both cases the position of the images should lie well outside the loudspeaker positions (*if* you have a pair of speakers that can image accurately). He then walks back to the center of the nave, then to the rear of the church about 60′ from the microphone array. Clapping his hands, he then walks back up the nave to the microphone position and around the microphone (left to right), ending up in front of the piano. (Because stereo microphones cannot discriminate between soundsources in front of them and behind them, you should hear Larry move back behind the speakers rather than behind your listening chair.) JA's voice comes from a small foldback loudspeaker placed on a chair to the left of center of the stage, right behind the piano stool and next to the pulpit.

All through this track you should hear unambiguously where Larry and the loudspeaker are. You should hear Larry's image well beyond the speaker positions, when appropriate, and well back in the distance when he is at the back of the hall. When he walks around the microphone position, you should also hear his image lurch to the far left, then back, then recede a little. If his position at any place seems confused or vague, then something in your system is not imaging as it should.

The microphones were left in the same position for both of the following tracks. In a sense, therefore, this "mapping" sets the context for the image of the 9′-long piano.

[11] Brahms: *Intermezzo* Op.117 No.1 in E-flat (AAD) **5:24**
Robert Silverman, New York Steinway D
Recording Venue: Universalist Unitarian Church, Santa Barbara, CA
Recording Date: January 30, 1990
Recording Engineer: Kavichandran Alexander (Water Lily Acoustics)
Producer: John Atkinson
Analog tape editor: Hugh Davies
Microphones: two EAR The Mics set to figure-8 pattern, coincident at 90° and spaced vertically by 2″
Microphone preamplifier: EAR 824M, Cardas microphone cables
Recorder: Ampex MR70 ½″ open-reel recorder at 15ips
Tape: Ampex 456
Transfer to digital: Pygmy AD-1, Panasonic 3700 DAT, Ampex MR-20 open-reel recorder, Cardas Hexlink balanced interconnects
Digital Transfer Engineer: Robert Harley

4 As Larry was facing away from the altar, he refers to far left as "stage right" and far right as "stage left."

Robert Silverman at the 9' Steinway, framed by the mike array (see fig.4)

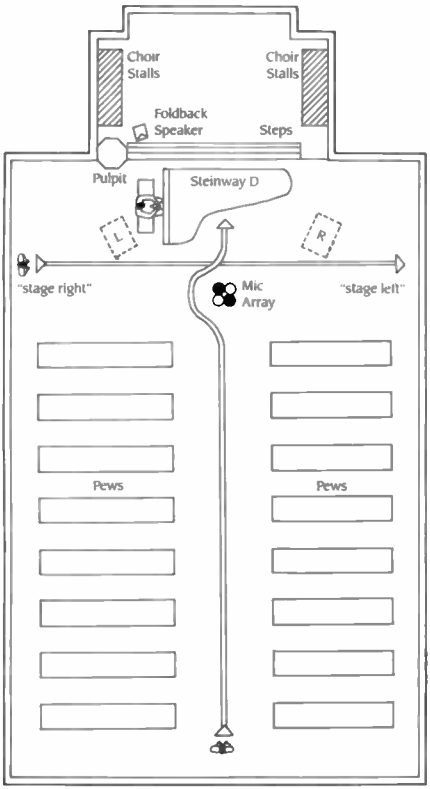

Fig.4 The Universalist Unitarian Church, Santa Barbara, showing positions of the piano, mike array, and LA's path in Track 10

For this piano recording, Kavi Alexander had wanted to capture a bold, powerful piano sound, particularly as the instrument was exciting the church acoustic to a rather excessive degree. The microphone array was placed quite close, about 8' back just below the line of the lid (see photo). The image of the Steinway should therefore be just behind the plane of the speakers, extending from the inside edge of the left-hand speaker, which is where Robert is sitting, to the inside edge of the right (fig.4). The use of a Blumlein technique means that the image should be "solid," though there is a slight pulling to the sides noticeable with loudspeakers possessing sufficient resolving power, due to the slight vertical spacing of the mikes.

Regarding the recording's tonal quality, those used to the typically bright sound of "commercial" piano recordings will find its treble to be a little soft. This accurately represents the true sound of the instrument in the hall at the microphone position, however. The complex manner in which notes decay, their harmonics intertwining, should be readily apparent, while the midrange should be evenly balanced, with no notes "jumping" forward at the listener. In the bass, there should be a strong feeling of weight to low frequencies, low bass notes having some of the quality of a deeply tolling bell.

The dynamics of the instrument's sound

were well captured: in the words of Alfred Brendel, its volume ranges "from a whisper to a roar." Kavi hit the ½" tape hard, reaching 14dB over the 250nWb/m 0VU mark, meaning that tape hiss was nonexistent even without noise reduction. The limiting factor affecting the recording's dynamic range is actually the intrinsic noise of the microphones rather than that of the analog tape; at a realistic playback level—96dB at the most at the listening seat for the very loudest passages—this can be noticed as a soft hiss. Not surprisingly, if you turn up the playback level so that what should be quiet passages become more "impressive," the microphone noise will become intrusive.

Whereas *Stereophile*'s CD release of the three Op.117 *Intermezzi*, coupled with the Sonata in f, Op.5,[5] was mastered using the Manley Analogue to Digital Converter, this track was transferred to digital using the Pygmy AD-1, another well-respected unit. RH tried to keep the levels identical with both the A/D converters, so any differences you hear between this track and the same recording on *Stereophile*'s *Intermezzo* CD will be due to the difference in converters. Remember: "Bits is bits"—or are they?

The first of the three Brahms Op.117 *Intermezzi* was written in 1892 and is prefaced by the opening couplet of "Lady Anne Bothwell's Lament," an old Scottish ballad:

Schlaf sanft, mein Kind, schlaf sanft und schön!
Mich dauert's sehr, dich weinen sehen.
(Sleep soft, my bairn, now softly sleep!
My heart is wae to see thee weep.)

"Brahms used to call this lovely melody 'the lullaby of my griefs,' " wrote Denis Stevens, "and those who know anything of his life will be well aware of the sorrows he had to bear. Yet this is music to soothe all humanity, and has been capable of doing so ever since it first saw the light."

[12] Beethoven: "Mozart's Minuet in G" (ADD) **0:44**
Robert Silverman, New York Steinway D
Recording Venue: Universalist Unitarian Church, Santa Barbara, CA
Recording Date: January 30, 1990
Recording Engineer: Kavichandran Alexander (Water Lily Acoustics)
Microphones: two EAR The Mics set to figure-8 pattern, coincident at 90° and spaced vertically by 2"
Microphone preamplifier: EAR 824M, Cardas microphone cables
Recorder: Ampex MR70 ½" open-reel recorder at 15ips
Tape: Ampex 456
Transfer to digital: Manley Analogue to Digital Converter, Aiwa HD-S1 DAT, Ampex ATR-100 open-reel recorder, AudioQuest Lapis balanced interconnects
Digital Transfer Engineer: John Atkinson

As a contrast to the Brahms *Intermezzo*, but again also to set the sound and image of the big Steinway within its acoustic context, we have included this bit of fun, recorded during the same sessions, with piano and microphones in the same place. With this lurching exception, due to a music publisher's mental aberration, a minuet is *always* in ¾ time. Robert provides the appropriate emphasis on every fourth beat, but if you try counting aloud "1-2-3-4," starting on the work's very first note, you'll find that it all works out: "Mozart's Minuet in G," in 4/4 time.

[13] Edward Elgar: *The Dream of Gerontius*, Part 1 (conclusion) (ADD) **7:07**
Stephen Roberts (bass), Oundle & District Choral Society, St. Ives Choral Society, St. Neots Choral Society, Huntingdonshire Philharmonic, conducted by Christopher Brown, with Arthur Willis at the organ of Ely Cathedral
Recording Venue: Ely Cathedral, Ely, England
Recording Date: July 7, 1984
Recording Engineers: John Atkinson, Ivor Humphreys[6]
Microphone: Calrec (AMS) SoundField Mk.III, set to coincident figure-8 pattern at 90°
Recorder: ReVox A77 Mk.IV ¼" open-reel recorder at 15ips (NAB EQ) with dbx II noise reduction
Tape: TDK GX
Transfer to digital: Manley Analogue to Digital Converter, Aiwa HD-S1 DAT, ReVox PR-99 open-reel recorder, dbx 224 noise-reduction unit, AudioQuest Lapis balanced and unbalanced interconnects
Digital Transfer Engineer: John Atkinson

The Calrec Soundfield microphone, a single-point, multi-capsule design originally developed to make Ambisonic recordings, is supplied with a sophisticated control center that, in addition to Ambisonic pickup, allows the user to select many different coincident stereo patterns. For this recording John Atkinson used the control center to synthesize a pair of figure-8 microphones pointing left and right with an angle of 90° between them. This gives an extremely accurate recreation of the original soundfield, but as such a pair of microphones picks up all the sounds to their rear as well as to their front, it's hard for the engineer to strike exactly the right balance between the direct sound of the instruments and the echoes of that sound from the hall's

5 The recording of *Intermezzo* was described in *Stereophile*, Vol.14 No.2, February 1991. *Intermezzo* is available on either LP or CD for $16.95 plus $2 shipping and handling: order from *Stereophile*, LP/CD Department, P.O. Box 5529, Santa Fe, NM 87502.

6 These days Audio Editor of *Gramophone* magazine.

The audience's view of *Gerontius* in Ely Cathedral: the SoundField mike is on the tall stand above the conductor's head; the orchestra overflows into the arches each side of the nave.

walls, ceiling, and floor: the "reverberation." Small forward and backward movements in microphone positioning also yield large changes in the recording's soundstage perspective.

Because of restrictions imposed by the Cathedral staff, who were worried about the microphone falling on members of the audience, the only place it was possible to place the SoundField mike was on a high stand about 12′ above the conductor's head (see photo). This means that the image of the solo bass, who portrays the Priest, is set far left, in theory beyond the outside edge of the loudspeaker. The large orchestra, on the floor, is relatively much closer to the microphone than the 200-strong choir (who were on risers), which means that the strings, in par-

Gerontius in rehearsal, with flautist Peter Walker of Quad just visible at the right of the photograph

ticular, sound somewhat dry. The orchestral image is also very wide, with the tympani, double-basses, and harp at the edges of the soundstage. Note that what Gordon Holt calls the "brassy blattiness" of the trombones and trumpets is captured intact by the relatively distant miking. It's rare to hear these instruments this "brassy" and "blatty."

Overall, however, a tremendous sense of space has been captured by the single-point technique, and the choir should sound distinct but set well back in the Cathedral's stone-faced acoustic. The organ pipes are positioned on the middle left, in the vast altar space behind the choir. Elgar uses the instrument's pedals to underpin the work's tonal foundations at strategic points; sitting where JA was, beneath the choir risers, he remembers the live sound of the 16′ and 32′ bass pipes shaking him to the core at the end of the work's first part.

As indeed this music, part both of the greatest work in the English choral tradition and of one of the greatest Roman Catholic pieces, should. Elgar wrote *Gerontius*, based on a poem by Cardinal Newman concerning the travails the soul of an ordinary man endures after death on the way to judgment and Purgatory, in the closing days of the Victorian era. Both the music and the spirit of the work have strong ties to Wagner's *Parsifal*, while the "Go forth upon your journey Christian soul" theme heard in this extract is based on one Elgar had composed with General Gordon of Khartoum in mind—Gordon had been deeply moved by Newman's poem—for use in a symphony but which he then rejected. "This is the best of me. . .this, if anything of mine, is worth your memory," Elgar quoted from Ruskin on the work's manuscript score. Which makes it all the more surprising that the first performance, conducted by an unprepared Hans Richter at the Birmingham Triennial Music Festival in October 1900, was a complete disaster. It did not take many years, however, for the work's quality to shine through, and it is now widely regarded ("Pomp & Circumstance" aside) as being the work most closely identified with the greatest English composer.

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[14] Corey Greenberg: *Eden* (AAD) 3:14
Corey Greenberg (electric guitars)
Recording Venue: KBTS-FM Studio B, Austin, Texas
Recording Date: December 16, 1987
Recording Engineer: Corey Greenberg
Microphone: none (uh-oh. . .)
Recorder: Otari MX5050B-II ¼" 2-track and MX5050B-III 4-track open-reel recorders at 15ips (NAB EQ)
Recording Equipment: Tascam board, Yamaha SPX-90 digital effects unit, Chandler Tube Driver guitar preamp, Urei LA-4 compressors, Canare cable
Transfer to digital: Manley Analogue to Digital Converter, Aiwa HD-S1 DAT, ReVox PR-99 open-reel recorder, AudioQuest Lapis balanced interconnects
Digital Transfer Engineers: John Atkinson, Corey Greenberg

"I've always loved the music of Jimi Hendrix," writes Corey Greenberg. "Beyond his

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swashbuckling image lay an awesome compositional mind, coupled with perhaps the most gifted instrumental technique in the history of the guitar. Whether it was Jimi's ferocious blues power or his soulful rhythm playing, his music affects me like no other's; in my opinion, he's *still* the high-water mark.

"So when my friend Tracy asked me to help her with a project for her Beginning Recording class at UT's Radio-TV-Film department, I was eager to lay down a tribute to the man who made me pick up a guitar in the first place. The project was: to come up with a recording that 'evoked a mood'; I chose 'unbridled rage,' and took my idealized vision of the just-born Eden as the visual equivalent of my aural statement. *Jeez*, that sounds New Age-y.

"Anyway, it soon became apparent that studio tricks like backwards guitar solos weren't part of UT's course curriculum, so Tracy suggested that I just take over the recording duties as well as the playing; I had to *swear* never to reveal to her professor that it was *I* who had actually pressed the 'Record' and 'Stop' buttons, and after a solemn ritual involving swapped bloody handshakes and this weird butt-bumping dance to seal our unholy vow, Tracy went to get a sandwich and I got down to work.

"While I would've preferred to mike my Fender Bassman guitar amp, the studio I recorded *Eden* in is *right* next to KBTS-FM's main studio; although the concept intrigues, screaming banshee freakout guitar leaking out over the DJ's mike is *not* the stuff of which Arbitron ratings are made. So instead of miking the speaker of a tube guitar amp, I plugged my guitar (and its attendant effect devices) directly into the board, and tried to get as cool a tone as I could with creative EQ, reverb, and a few other tricks.

"In addition to the 'solo' guitar, a lot of the ambient swell is also backwards guitar. This technique involves physically flipping the analog tape over and listening to the backing tracks *backwards* while you lay down the new track. Why on God's Green Earth would anyone want to record anything *backwards*, you ask? Because, aside from the obvious phrasing reversal, recording a guitar backwards changes its inherent transient envelope; what's normally a loud note followed by a sustained die-off becomes a faint cry off in the distance that builds into a BANG and then—*whup!*—it's gone. As the tape is actually progressing from the end of the music to the beginning, a certain amount of conceptual planning is a good idea, lest the backwards track end up as random-sounding as some of CS&N's experiments along these lines. According to Hendrix's producer Eddie Kramer, Jimi had the uncanny ability to record a solo backwards, all the while knowing *exactly* how it would sound after the tape was flipped back over. This is more the approach I was shooting for, so I had to play the ending coda *first* and the beginning primal burps *last*. Confused? Try DOING it sometime!

"All the sounds on *Eden* are guitar, including the repeat-delayed volume-knob swells in the beginning that sound like voices 'ahhh'-ing,' but excluding the water and seagulls, which were courtesy of a sound-effects record we had lying around the studio. Incidentally, if you have access to an open-reel deck, you can record *Eden* and flip the tape over to hear the solo 'forwards,' although you'll also hear the subliminal message 'Eat lots of pork products.'

"By placing the various guitars and reverbs all over the place, I tried to create a deep, spacious soundstage. Of course, this depth is entirely artificial, created as it was with a Yamaha SPX-90 digital reverb twiddled to produce an extra-long reverb algorithm. The movement of the solo distorted guitar came from a heavy hand on the pan pot and fader, and *not* me running back and forth through the studio with my amp strapped to my back as suggested by TJN. All the guitars are first-takes, the total time between actual recording and final mixdown being about two hours; I'm a firm believer in the Elvis Ethos: 'Take Care of Business, Lightning-Quick.'

"The day John and I spent transferring the ¼" 2-track master to digital was both enlightening and unnerving. Because while we had the privilege of using the edge-of-the-art Manley A/D converter, a unit as superior to what's used for most commercial recordings as a Goldmund is to a Fisher-Price, there was STILL audible degradation when comparing the DAT copy to the analog master! I mean, it's not like we were using a mega-tweaked tube Ampex 300 for the analog and a $99 Walmart CD player to solve the Great Analog/Digital Debate; the Aiwa DAT machine fed the super-bad Manley Reference D/A converter, while we played the analog master

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of *Eden* back over John's stock Revox PR99 deck. A better digital transfer setup doesn't exist, yet John, TJN, RL, and I *all* heard a distinct loss of depth. This was *especially* apparent at the end of the solo, when the raging guitar suddenly implodes; I purposely rammed down the fader during the original mixdown to create a massive surge of reverb toward the 'rear' of the soundscape. With the analog master, my intended effect of a huge wave of ambience soaring out into space was clear; the DAT version, however, curtailed this last gasp of reverb, making it sound like the wave was suddenly soaked up by the beach a good 50 yards before it was supposed to be. Tonally, the DAT copy is very faithful to the original master, but the sense of ambience I worked very hard to create with the various reverbs and production techniques is somewhat foreshortened. As John said while we listened to the playback, 'If you never heard the original analog master, the digital transfer sounds *damn good*!' Which it does. But for *this* listener, the whole issue of 'digital sounds drier cuz analog exaggerates ambience with resonant spuriae/phase anomalies/increased distortion' has been settled for good.

"And last, even though this recording features electronically produced sounds, massive intentional distortion, completely unnatural backwards guitars, tons of multi-tracking with absolutely no regard for correct polarity, and a totally artificial ambient environment, the audible tape hiss and AC hum are there because I refused to use Dolby; I am, after all, a *purist*."

SUBJECTIVE ROOM & SPEAKER DIAGNOSTIC TRACKS

[15] Pink Noise at -20dBFS (DDD) 1:24
Correlated between channels, then uncorrelated from 0:42

[16] Bass Decade 1/3-octave warble tones at -20dBFS (DDD) 2:47
Center frequencies: 200Hz (Index 1), 160Hz (Index 2), 125Hz (Index 3), 100Hz (Index 4), 80Hz (Index 5), 63Hz (Index 6), 50Hz (Index 7), 40Hz (Index 8), 31.5Hz (Index 9), 25Hz (Index 10), and 20Hz (Index 11)

[17] Midrange Decade 1/3-octave warble tones at -20dBFS (DDD) 2:32
Center frequencies: 250Hz (Index 1), 315Hz (Index 2), 400Hz (Index 3), 500Hz (Index 4), 630Hz (Index 5), 800Hz (Index 6), 1kHz (Index 7), 1.25kHz (Index 8), 1.6kHz (Index 9), 2kHz (Index 10)

[18] Treble Decade 1/3-octave warble tones at -20dBFS (DDD) 2:32
Center frequencies: 2.5kHz (Index 1), 3.15kHz (Index 2), 4kHz (Index 3), 5kHz (Index 4), 6.3kHz (Index 5), 8kHz (Index 6), 10kHz (Index 7), 12.5kHz (Index 8), 16kHz (Index 9), 20kHz (Index 10)

[19] Music Articulation Test Tone (DDD) 1:19

These tracks are intended to enable audiophiles to get a handle on how their systems and loudspeakers interface with their listening rooms, even if they don't have any test equipment.

The sound on Track 15 is random noise with equal energy per musical octave, recorded in dual mono. Called "pink" noise by engineers, it easily enables the listener to hear loudspeaker problems. It *should* sound like absolutely smooth rushing water with no band of frequencies sticking out any more than any other. It should also not sound hollow or colored in any way, while the image of the noise should appear to come from a narrow point midway between the speakers. If the sound of this track fails to meet any of these criteria, then try sitting higher or lower, closer or farther away, or moving the speakers and/or nearby furniture. The second noise signal is the same as the first except that each channel of noise was recorded independently. The overall sound should therefore appear to be very spacious. Listen, however, to see if any frequency bands stick out or appear to give a central image, particularly in the treble. If this happens, then your speakers probably have some resonant problems in those regions.

The warble-tone tracks (which roughly illustrate the extent of the terms "bass," "midrange," and "treble") were recorded on a JVC XD-Z1010TN DAT recorder from the output of an Old Colony Sound Lab warble-tone generator, the frequency quoted being the approximate center frequency of each. The generator contains a sinewave oscillator that is frequency-modulated at a rate of 5Hz or so; this is fast enough that the effect of low-frequency room resonances on the perceived level will be minimized, the test tone changing sufficiently quickly that the resonance doesn't have time to fully develop.

The bass warble tones can therefore be used to give a good idea of a loudspeaker's subjective bass extension in the listening room, either by listening or by using a sound-level meter—Radio Shack sells quite a good one for around $30. Set a reference level with Track 17, Index 7, the 1kHz band, then note by how much the sound level drops with

each successive warble tone.[7] (If your cassette deck came with a microphone, put the mike at your listening chair, set the recorder to "Record," and monitor the sound level with its meters.) The 200Hz–100Hz bands can be considered the upper bass, 80Hz–40Hz the midbass, and the remaining bands the low bass. If these bass warbles sound or measure uneven, with some either sticking out more than others or missing in action, then try moving the speakers or your listening chair around the room. The object is to get the tones as even-sounding/measuring as possible.

Tracks 17 and 18 offer sets of warble tones covering the Midrange and Treble decades,[8] so that you can measure the in-room response of your loudspeakers without having to pop for an expensive spectrum analyzer. The 1kHz warble tone can also be used to get a relative idea of a loudspeaker's sensitivity: measure the sound-pressure level with a loudspeaker whose sensitivity you know, then, without changing the playback level, measure the spl of an unknown loudspeaker substituted into the system.

The Music Articulation Test Tone was supplied by Acoustic Sciences Corporation, the progenitor of the Tube and Studio Traps (see *Stereophile* Vol.9 No.3 and Vol.15 No.2), and again allows you to get a handle on your loudspeaker positioning and your listening-room acoustics. Essentially a "musical range intelligibility" or "Modulation Transfer Function" test, according to Acoustic Sciences' Arthur Noxon, the test signal consists of a rapid sequence of tone bursts that starts at 28Hz, rises in pitch to a peak at 780Hz, then descends back down the scale to 28Hz (see fig.5). Each burst is 2Hz above the previous one, there are eight bursts every second, and each burst last 1/16s, followed by 1/16s of silence. The frequency at any point in the test is easily determined with a stopwatch, therefore, as the tone burst changes frequency by 16Hz every second. For ascending tones, the frequency = 28 + 16t Hz, where t is the time in seconds; for descending tones, the frequency = 1532 – 16t Hz.

The best way to audition the MATT test is to first listen to the quality of the tone sequence over headphones, then over your loudspeakers. (The sound level should be set to your normal listening level.) "It is always a surprise how unintelligible audio playback systems can be," notes Arthur Noxon. "Some sections of the test will sound out articulate 'TAT, TAT, TAT,' representing clean, fast attack transients, stable sustains, and rapid decays. But interspersed among these articulate passages will be heard totally garbled 'BUDDULA, BUDDULA, BUDDULA' sounds. If you listen close to the speakers, the garbled passages will disappear, but as you back away from them into the room, the amount of garbled signal will increase rapidly."

The Radio Shack SPL meter can be used with the MATT signal. Set the speed to FAST and the weighting network to C SCALE. Adjust the speaker volume and meter gain so that the display does not peg the meter. Simply watching the meter needle is instructive: first experience a fully articulate signal by holding the meter a couple of feet from the speaker, on-axis. The needle will vibrate rapidly as it follows the rapid loud-quiet-loud-quiet of the tone-burst sequence. Now move back to the listening position and the needle will not move nearly as wildly. It will barely quiver during the inarticulate passages and mildly fluctuate during the more articulate passages.

The object of the test is to move your speakers and/or listening position and/or add acoustic treatment to your listening room to obtain the most articulate sound/SPL meter reading across the entire frequency range of

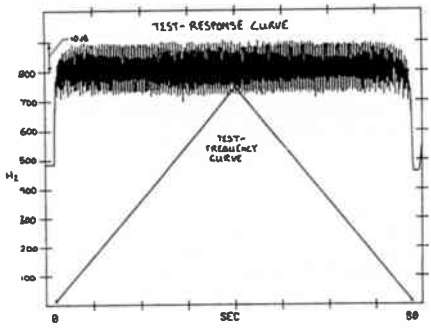

Fig.5 ASC Music Articulation Test Tone, plotting toneburst frequency (triangular curve) and amplitude (ragged curve) against track playing time

7 Whereas the warble tones on the succeeding tracks increase in frequency, those on Track 16 decrease, to make it easier to judge bass extension by ear.

8 The 20kHz warble tone is included for completeness's sake, but because of its proximity to the edge of the CD passband, its actual center frequency measures closer to 18kHz.

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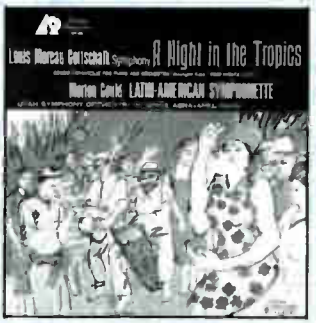

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DISTORTION & JITTER DEMONSTRATION TRACKS

[20] The Harmonic Series, 500Hz fundamental (L+R) (DDD) 0:24
500Hz, 1kHz, 1.5kHz, 2kHz, 2.5kHz, 3kHz, 3.5kHz, 4kHz, 4.5kHz, 5kHz, 5.5kHz, 6kHz, 6.5kHz, 7kHz, 7.5kHz, 8kHz, 8.5kHz, 9kHz, 9.5kHz, 10kHz, at –10dBFS

[21] Second-harmonic distortion (L+R) (DDD) 1:42
500Hz at –10dBFS + 0% second-harmonic distortion (Index 1), then 10%; 0% (Index 2), 3%; 0% (Index 3), 1%; 0% (Index 4), 0.3%; 0% (Index 5), 0.1%

[22] Third-harmonic distortion (L+R) (DDD) 1:42
500Hz at –10dBFS + 0% 3rd harmonic distortion (Index 1), then 10%; 0% (Index 2), 3%; 0% (Index 3), 1%; 0% (Index 4), 0.3%; 0% (Index 5), 0.1%

[23] Seventh-harmonic distortion (L+R) (DDD) 2:02
500Hz at –10dBFS + 0% seventh-harmonic distortion (Index 1), then 10%; 0% (Index 2), 3%; 0% (Index 3), 1%; 0% (Index 4), 0.3%; 0% (Index 5), 0.1%; 0% (Index 6), 0.03%

[24] Typical amplifier distortion signatures (L+R) (DDD) 0:32
500Hz at –10dBFS (Index 1), 500Hz at –10dBFS + tube THD (Index 2), 500Hz at –10dBFS + solid-state THD (Index 3)

[25] Harmonic & sub-harmonic distortion (L+R) (DDD) 0:22
1kHz at –10dBFS pure (Index 1), 1kHz + high-level panel speaker THD (Index 2).

[26] Jitter demonstration track with spoken warning (L+R) (DDD) 0:48
11kHz at –10dBFS (Index 1), 11kHz affected by 10ns p-p jitter of 4kHz tone (Index 2), 11kHz pure (Index 3)

Audiophiles will be familiar with the term "Harmonic Distortion," but how many are really comfortable with what it means? When a signal passes through a hi-fi component, not only will it be reproduced, but so will higher-frequency "images" of that signal at integer multiples of its frequency (track 20). (These are also the notes that a player can produce from a natural horn or trumpet, by varying the tension of his lips.) To show this effect, fig.6 is the spectrum of a pure 500Hz sinewave tone, a single peak being visible at the fundamental frequency. If a hi-fi component adds what is termed "second-harmonic distortion," then it will add a spurious tone at twice the fundamental frequency. This can be seen in fig.7, which indicates 10% of second-harmonic distortion by the peak at 1kHz. Another way of describing this would be to say that the spurious 1kHz tone lies at –20dB (decibels) with respect to the fundamental. This is why the distortion spectra featured in *Stereophile* and other magazines often have a vertical scale calibrated in dB. Similarly, figs.8 and 9 show 10% of third-harmonic (3 x 500Hz = 1500Hz) and seventh-harmonic distortion (7 x 500Hz = 3500Hz).

Tracks 21, 22, and 23 allow you to compare different levels of second-, third-, and seventh-harmonic distortion with the pure tone, so that you can test yourself as to how much of each kind of distortion you can hear. Make a note at where you can no longer hear any difference between the pure and distorted tones.

In general, the audibility of any particular harmonic will depend on the distance between it and the fundamental on the spectrum's horizontal scale. For manufacturers and reviewers merely to quote a single distortion specification—0.1% or –60dB, for example—is therefore no guide as to whether that distortion will be audible or not (something that *Stereophile*'s founder, J. Gordon Holt, has said for many years). To demonstrate this phenomenon, tracks 24 and 25 compare the sounds of a pure tone with distortion "signatures" typical of a classic tube amplifier near its clipping point (fig.10), an inexpensive class-B solid-state amplifier (fig.11), and a panel speaker near its overload point (figs.12 and 13). (While all these spectra were generated purely in the digital domain by the Audio Precision System One Dual Domain, they were taken from review measurements of real amplifiers and speakers from the last few years.)

The tube amplifier's distortion is high in level, around 3%, and includes some 120Hz power-supply hum, while the THD of the solid-state amplifier is 10 times lower in level, at around 0.3%. Note, however, that the latter

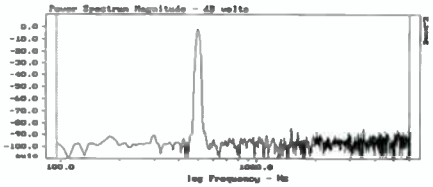

Fig.6 Spectrum of pure 500Hz tone at –10dBFS (100Hz–6kHz)

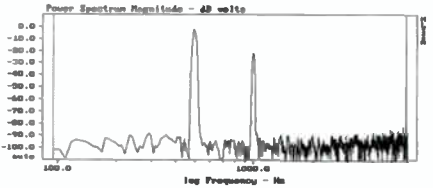

Fig.7 Spectrum of 500Hz tone at –10dBFS with 10% 2nd-harmonic distortion (100Hz–6kHz)

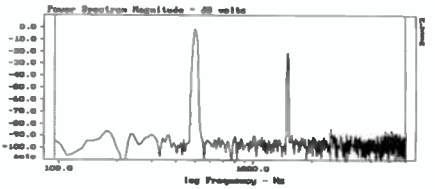

Fig.8 Spectrum of 500Hz tone at –10dBFS with 10% 3rd-harmonic distortion (100Hz–6kHz)

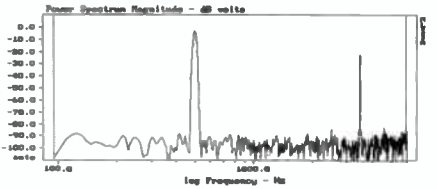

Fig.9 Spectrum of 500Hz tone at –10dBFS with 10% 7th-harmonic distortion (100Hz–6kHz)

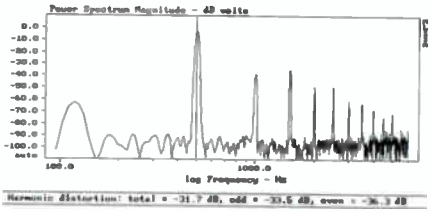

Fig.10 Spectrum of 500Hz tone at –10dBFS with hum and distortion typical of a classic tube amplifier near clipping (100Hz–6kHz)

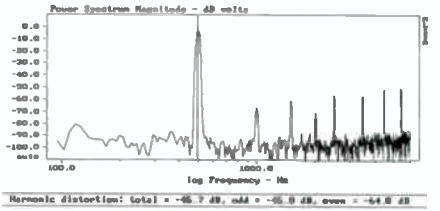

Fig.11 Spectrum of 500Hz tone at –10dBFS with distortion typical of an inexpensive solid-state amplifier operating in class-B (100Hz–6kHz)

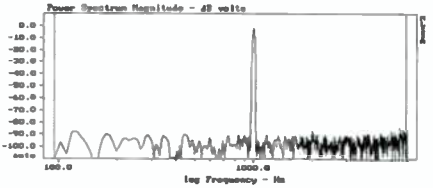

Fig.12 Spectrum of pure 1kHz tone at –10dBFS (100Hz–6kHz)

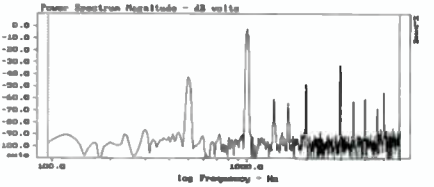

Fig.13 Spectrum of 1kHz tone at –10dBFS with distortion typical of a planar diaphragm near its overload point (100Hz–6kHz)

is as audible—if not more audible—despite its lower level, because its spectrum favors the higher harmonics. Track 25 is interesting because a panel speaker is a fundamentally chaotic system: when it distorts, it also adds *sub*harmonic and enharmonic components—the mathematician Manfred Schroeder has said that the production of subharmonics is always an indication of chaotic behavior. Normal harmonic-distortion components of the 1kHz fundamental can be seen at 2kHz, 3kHz, 4kHz, and 5kHz, with the third harmonic being the highest in level at –30dB or 3%, but a strong component at *half* the fundamental frequency can be seen, as well as a couple of enharmonic components between 1kHz and 2kHz. The 500Hz component is 40dB down or 1%, but is very audible because its frequency is lower than that of the fundamental.

A different kind of distortion is that occurring in the digital domain due to timing

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uncertainty in the datastream. "Bits is bits," say many engineers, but they're really only correct when those bits occur at precisely defined intervals. Any regularly occurring timing imprecision in the digital data words will result in spurious tones appearing in the signal when it is finally converted to analog (see *Stereophile*, May 1990, pp.49–55 and 81–85; December 1990, p.179; and October 1991, pp.63–69). The effect is worse at high levels and at higher frequencies. To demonstrate this, track 26 offers first a pure tone at 11kHz—***WARNING: DON'T PLAY THIS TRACK TOO LOUD***—followed by the same tone with the effect of the data words representing the tone being jittered at a frequency of 4kHz (figs.14 and 15, respectively).[9] Each data word should be precisely spaced at 22μs (0.000022s) intervals; the uncertainly in the data word timing is 10ns (0.00000001s) peak-peak. This is a little higher than that encountered in typical CD players, but it has been exaggerated to make the effect clearly audible. In real life, too, the jitter uncertainty would not necessarily be a pure tone, but a mixture of tones as well as noise and hum. Nevertheless, we hope that you can hear the roughness in the decoded sound of the tone due to a purely digital phenomenon. (If the two halves of track 26 sound identical, then it is likely that the difference is being obscured by high levels of jitter in your player and/or processor.)

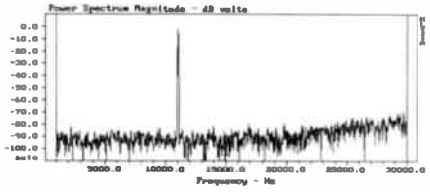

Fig.14 Spectrum of pure 11kHz tone at –10dBFS (1kHz–30kHz, linear frequency scale)

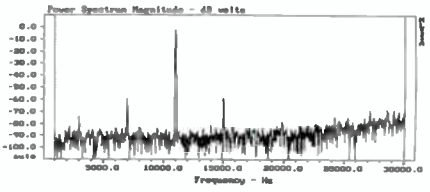

Fig.15 Spectrum of 11kHz tone at –10dBFS, jittered with 10ns p-p of 4kHz (1kHz–30kHz, linear frequency scale)

CD PLAYER & TAPE RECORDER ALIGNMENT TEST TRACKS

[27] Spot frequency tones at –20dBFS (L+R) (DDD) **6:15**
10Hz (Index 1), 12.5Hz (Index 2), 16Hz (Index 3), 20Hz (Index 4), 25Hz (Index 5), 31.5Hz (Index 6), 40Hz (Index 7), 50Hz (Index 8), 63Hz (Index 9), 80Hz (Index 10), 100Hz (Index 11), 125Hz (Index 12), 160Hz (Index 13), 200Hz (Index 14), 250Hz (Index 15), 315Hz (Index 16), 400Hz (Index 17), 500Hz (Index 18), 630Hz (Index 19), 800Hz (Index 20), 1kHz (Index 21), 1.25kHz (Index 22), 1.6kHz (Index 23), 2kHz (Index 24), 2.5kHz (Index 25), 3.15kHz (Index 26), 4kHz (Index 27), 5kHz (Index 28), 6.3kHz (Index 29), 8kHz (Index 30), 10kHz (Index 31), 12.5kHz (Index 32), 14kHz (Index 33), 15kHz (Index 34), 16kHz (Index 35), 18kHz (Index 36), 20kHz (Index 37)

[28] De-emphasis test tones at –20dBFS, (L+R) (DDD) **0:52**
100Hz (Index 1), 1kHz (Index 2), 4kHz (Index 3), 10kHz (Index 4), 16kHz (Index 5)

[29] Noise Modulation Test Tones (L+R) (DDD) **1:02**
41Hz at –50dBFS (Index 1), –60dBFS (Index 2), –70dBFS (Index 3), –80dBFS (Index 4), –90dBFS (Index 5), –100dBFS (Index 6) with dither

Track 27 consists of 37 sinewave tones, each lasting 10s, covering frequencies from below audibility to the top of the audio band, all recorded at the same level. These will enable anyone with an accurate voltmeter—we can confidently recommend the handheld Fluke 87 series as being flat in the audio band—to assess the frequency response and crosstalk of their amp, preamp, and tape decks. By contrast, the tones on track 28 have been recorded with a treble boost. Termed "pre-emphasis," this boost is canceled by a complementary cut in the treble when the CD is played back, due to the CD player detecting what is termed the "pre-emphasis flag," if set in the datastream. The result is that HF distortion and noise are reduced in level (though there is an unfortunate tradeoff in high-frequency headroom, which is why most discs are not pre-emphasized). If your CD player's de-emphasis circuitry is operating correctly, these tones should all measure as being identical in level. If not, then any pre-

9 Because of the practical impossibility of us applying specified amounts of jitter in your CD player, this track actually contains the mirror-image situation: the data representing the 11kHz tone have been altered by calculating the effect of the same jitter added at the original A/D conversion. Jitter is jitter, however, no matter where it actually originates, though in this case, the bits are no longer the same bits.

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emphasized CDs will not be reproduced with the correct tonal balance. (Track 9 on this CD, for example—Peter Mitchell's organ recording—is recorded with pre-emphasis.)

Track 29 will enable those with access to a spectrum analyzer to examine their CD player's performance with a new test proposed by Audio Precision's Dr. Richard Cabot[10] at the February 1991 Audio Engineering Society Convention in Paris. The test, based on psychoacoustic principles, attempts to predict the audible performance of a player's D/A conversion by measuring its noise modulation.[11]

The technique is straightforward: the D/A section is driven with the code representing a low-frequency sinewave, the player's output is high-pass filtered to remove the test signal, and a ⅓-octave spectral analysis of the analog output is performed. The result is plotted as noise level *vs* frequency. The measurement is repeated at different input-signal levels, with each curve overlaid on the previous curves for easy comparison.[12]

The test-signal frequency is 41Hz, chosen because it is not an integer sub-multiple of the sampling frequency. The test signal will thus exercise the greatest number of steps in the DAC. Six signal levels are used, from −50dBFS (FS = Full Scale) to −100dBFS, in 10dB steps.[13]

Basically, the technique measures noise-floor shifts (a result of quantization distortion) as a function of signal level. There is a direct correlation between low-level linearity and performance in this test. In addition to how *much* the noise floor is modulated by signal level, the measurement reveals shifts in the noise floor's *spectral balance* with changes in signal level. Ideally, the noise-floor spectrum should remain constant with level, producing curves that exactly overlay each other. Psychoacoustic research by Louis Fielder at Dolby Labs indicates that noise-floor shifts of 2dB are audible. Further, Dr. Cabot's paper asserts that the ear is very sensitive to shifts in the noise floor's spectral balance; changes on the order of 1dB are reportedly audible.

HIGH-LEVEL TEST TRACKS

[30] 19+20kHz at 0dBFS with spoken warning (L+R) (DDD) 0:21
[31] 20kHz at 0dBFS with spoken warning (L+R) (DDD) 0:31
20kHz at −20dBFS (L+R)

These tracks—which must not be played at high levels—will be of no concern to the audiophile who is just interested in music, but will be found very useful to those with spectrum analyzers. Track 30 tests a CD player or D/A processor for intermodulation distortion—see *Stereophile*'s reviews for more information. While only small children and bats will be able to hear the 19kHz and 20kHz tones, poorly performing CD players and amplifiers will produce audible tones much lower in frequency. Differences from the expected THD+noise differences between the two halves of Track 31 should be related to the amount of jitter in the digital datastream. S

10 See Robert Harley's interview with Dr. Cabot in *Stereophile*, Vol.14 No.1, January 1991.

11 "Noise Modulation in Digital Audio Devices" is available for $3 from the Audio Engineering Society, 60 E. 42nd Street, Room 2520, New York, NY 10165-0075. Tel: (212) 661-8528.

12 See *Stereophile*, February 1992, Vol.15 No.2, p.143.

13 To record digital data representing signals at or below the theoretical resolution limit of the 16-bit CD system, the appropriate amount of shaped dither noise was used.

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MICROMEGA TRIO CD PLAYER

Robert Harley

Micromega Trio CD player

Three-box CD player with Bitstream D/A conversion. No other technical specifications provided. Dimensions: 13⅛" W by 8¼" H by 14" D (including rear panel cables). Weight: 16kg (35 lbs). Price: $7500. Approximate number of dealers: 4. US distributor: Versa Dynamics, 36 West 20th Street, New York, NY 10011. Tel: (212) 243-8553.

"Technical details provide no useful information about the sound of the player and we therefore have nothing to say about the product's internal workings."

That was John Bicht's reply to my technical questions about what makes the Micromega Trio CD player tick. His response was unique; manufacturers are usually happy to tell me anything I want to know about how their products work. Designers are often like proud parents, exulting in their creation as they talk me through the unit's topology. They want *Stereophile* readers to know all about the little tweaky tricks and esoteric

components used in their handiwork.

Not so Versa Dynamics' John Bicht.[1] He has a disdain for specifications and the technical descriptions of products found in reviews. Versa Dynamics' view is that what really matters is how the product reproduces music—something that no amount of technical understanding or description can convey. John's advice to me was, "If I were writing the review, I'd say, 'It's three boxes and this is how it sounds.' "

He has a point: some audiophiles tend to be swayed by a product's technical description rather than by a personal musical evaluation. Indeed, some high-end advertising appeals to this tendency by printing a laundry list of the product's technical highlights: number of power-supply regulation stages, D/A conversion method, etc. This type of specmanship is more suited to Japanese mass-market equipment than true high-end products. John Bicht's fundamental premise—that specifications say nothing about the product's ability to communicate the music—is right on the money.

On the other hand, technical descriptions provide an insight into the designer's philosophy; the product is the direct physical embodiment of what he feels is important in high-end design. In addition, a technical understanding of a wide range of products sometimes suggests correlations between certain techniques or technologies and musical characteristics. To me, understanding what the designer did and why he did it offers a fascinating glimpse into the whole process of high-end product design. This is especially true in the rapidly changing field of digital processor design; the technology is so new that every designer has a different idea about what's important in making a musically satisfying product. By understanding and presenting each designer's approach, a clear consensus may emerge about what matters musically in digital to analog conversion.

While a technical understanding can be useful, it must not substitute for listening to your favorite music through the product under consideration. Even a review that reports on the product's sonic and musical characteristics cannot answer the fundamental question at the very core of high-end audio: "Do I *enjoy* music more when it is reproduced by this product?"

Indeed, it was the answer to this question that shaped my opinion of the Micromega Trio.

TECHNICAL DESCRIPTION

The Micromega Trio CD player is an unusual design. The unit comprises three slim black boxes—power supply, D/A converter, and CD transport—stacked atop one another. The top-loading transport is covered by a hinged plexiglass top, this concept created by Micromega and now used by Krell and others. Electrical connection between them is through a 9-pin D connector (power supply to transport) and a 37-pin D connector (power supply to digital processor). Micromega provides both standard RCA coaxial and Toslink S/PDIF interfaces between the transport and processor. A braided ground lead connects the power supply to the transport and processor. These ground wires' slip-on connectors permit a variety of grounding arrangements. An additional braided ground cable permits ground connection to a preamplifier. Analog output is via a pair of high-quality gold-plated RCA jacks.

A row of membrane-type touch switches runs across the transport's front panel. These provide transport control functions such as Play, Stop, Skip, and Fast Forward/Reverse. The transport can be programmed to play up to 20 tracks. An LED display shows track and index number, and can be switched from the front panel to display time information instead (but not both simultaneously). The small remote control provides Stop, Pause, Play, Skip Forward, Skip Backward, and Repeat functions.

The power-supply front panel has a power on/off switch, voltage selector (120V or 240V), ground lift switch, and four user-accessible fuse holders. Each of these fuses is accompanied by an LED to indicate if the fuse has blown.

The D/A conversion box itself has four switches: polarity inversion, mute, attenuation (12dB), and coaxial/optical input selection. A row of three small LEDs indicates which of three sampling frequencies is being received.

An unusual mechanical grounding scheme

1 John is the designer of the state-of-the-art Versa Dynamics turntables, and the founder of that company. With the market for LP playback equipment declining, he has turned his attention to the digital arena, starting with distribution of the French-made Micromega line of digital products.

is used in the Trio: each piece has two rubber feet and one spike. The transport's spike rests on a solid metal cylinder in the power supply that is slightly taller than the chassis. This metal cylinder is attached to the power supply's spike, which rests on the D/A converter's metal cylinder. The D/A converter's spike rests on the equipment rack. This arrangement provides rigid coupling straight through the three units in the front left-hand corner, and elastic coupling at two other points.

Looking at the unit in more detail, the power supply contains five transformers but little else. One of these transformers is part of a circuit that prevents the unit from blowing up if it is plugged into a 240VAC supply and the front-panel switch is set to 120V. The other four transformers supply 16 regulated supplies, only one of which is located inside the power supply itself. The only regulation in the power-supply box is a 7805 (+5V) regulator attached to a very large heatsink. All other voltage regulation is performed in the transport and processor, next to the circuits they supply. Sixteen electrolytic capacitors (either 2200μF or 3300μF) are bypassed with what appear to be film types. The power-supply box provides rectified and filtered DC for regulation in the other two boxes (transport and processor) via the D connectors. Four of the supplies go to the transport, and 12 to the digital processor. With the front-panel ground switch in the "GND" position, the negative-polarity side of the circuitry is pulled to ground level.

The transport is built around a Philips CDM 3 mechanism. A clear plexiglass top opens for placing the CD on the spindle, and a heavy clamp goes on top of the CD. Like the mechanical grounding arrangement on the three boxes, the transport mechanism itself is mounted rigidly on the front left-hand corner with a ball-and-socket system and elastically at two other points. A damping material covers the bottom exterior and portions of the chassis interior. The decoder and control chip is from Philips. Although it appears that four of the 16 supply stages go to the transport, I counted nine three-pin (TO-220 type) voltage regulators on the transport control board. I've never seen so many regulators in a CD drive.

The Trio's digital processor is based on the Philips SAA7321 Bitstream chip. Rather than use one chip for both channels, the Trio employs two 7321s (one per channel) for differential operation. An unbalancing circuit follows each 7321, converting the differential signal to single-ended, thus rejecting unwanted noise and distortion common to both signals. The output stage is fully discrete and uses high-quality film caps and metal-film resistors. Two rows of logic chips run the unit's length, separating the left and right audio signals and correcting their timing for input to the two Bitstream DACs. The popular Yamaha YM3623B S/PDIF chip is used in the digital input circuit. Most of the processor's voltage regulators are discrete rather than the ubiquitous three-pin IC type.

Overall, the Trio's design is, shall we say, idiosyncratic. The three-box approach, top-loading drive mechanism, D connectors, and elaborate mechanical grounding system all contributed the impression that the Trio was not designed with a "follow-the-pack" mentality. Ergonomically, I found the transport's small pushbuttons (with their even smaller type) somewhat inconvenient. I also felt the manual was lacking; the English translation was rough, the remote control wasn't even mentioned (there was one button on the remote marked "ALEA" whose function I never discovered), and the warranty terms were provided in French but not in English. Further, there is no mention that the three units should be stacked for the mechanical grounding to work as intended, or any other indications of how the Trio should be set up. True, most of these omissions have nothing to do with the product's sound, but I think for $7500 the purchaser is entitled to more complete documentation.

A few notes about setup. When John Bicht brought the unit to my listening room, he imposed three conditions: 1) that all microprocessor-based equipment throughout the house be turned off (VCR, microwave, clocks); 2) that all light dimmers be turned off; and 3) that the Trio be installed on a solid stand. None of these was a problem: the first two conditions were easily accommodated, and I have a lead-shot–and-sand-filled (and spiked) Merrill Stable Table. John Bicht's response to the Stable Table was, "Well, it will have to do." ". . . have to do?" What does John Bicht put *his* equipment on? I asked. Very short slabs of granite custom-cut by a tombstone maker!

He was right to be concerned about setup: the Trio is very fussy. In addition to the above conditions, the unit sounded its best only after a full day of warmup. Further, the clear plexiglass transport top should be covered with a cloth to prevent light from getting in. Covering the unit made a noticeable difference in the presentation. The Trio also sounded better with all the cables physically separated from each other, especially the coaxial digital cable and analog output cables. It's probably also a good idea to keep the digital cable away from the power-supply links. Finally, because of the plexiglass cover and top-loading design, the Trio needs the uppermost space in a solid rack—unfortunately the place where most of us have our LP turntables.

LISTENING

Power amplifiers auditioned with the Trio included the VTL 225W monoblocks, Boulder 500AE, McCormack DNA-1, and Parasound HCA-2200. Most of the listening impressions reported here were obtained with the VTLs. The preamp was an Audio Research LS-2 line stage, and loudspeakers were primarily the Hales System Two Signatures augmented with a Muse Model 18 subwoofer. Loudspeaker cables were biwired runs of AudioQuest Sterling/Midnight and interconnects were Expressive Technologies IC-1 (Trio to preamp) and AudioQuest Lapis (preamp to subwoofer). Other digital products on hand for comparison included a Wadia 2000, Kinergetics KCD-55 Ultra, and PS Audio's new UltraLink. Transports driving these stand-alone processors included the Nakamichi 1000mb (full review next issue) and a Theta Data, both via the glass fiber interface. All AC power to the system (except the Muse Model 18 and the VTLs) was conditioned by a Tice Power Block and Titan.

When John Bicht was visiting with the Trio, I was less than impressed by the unit. It sounded a little rolled off in the treble and lacking in detail. Moreover, the Trio didn't grab me musically. Manufacturers' visits, however, are not the ideal conditions for auditioning components; besides the reviewer being under JA's constraint of not giving the manufacturer any indication of what he thinks of the product, the conditions are generally not conducive to immersing oneself in the music.

I liked the Trio a little better during the first few short analytical listening sessions, in which I attempted to get a handle on the Trio's "sound." It was, however, only when I spent long sessions with the Trio and my favorite music that this product's special qualities emerged.

During these sessions I found myself intensely involved in the music, not the Trio's "sound." While I realized I would have to analyze and describe the Trio's character for this review, this way of listening was thrown out the window in favor of enjoying the music. I thus ended up with two sets of notes: sonic and musical impressions. I'll start with the musical.

First, the Trio didn't allow passive listening. It was the antithesis of bland and boring. I found myself swept up in the music, involved in every note and nuance of the performance. The Trio provided what seemed like a more direct connection between the musicians' expression and me. Discs brought out for one or two tracks were listened to and enjoyed in their entirety. There was the urge to play disc after disc, extending the listening sessions without regard for the passage of time. The Trio was one of those rare products that leaves you exhilarated and tapping your foot from the previous disc while the next disc is chosen and put on the transport.

Moreover, this kind of involvement continued throughout long listening sessions. The Trio was one of the most fatigue-free and easy-to-listen-to digital products I've auditioned (joining the Linn Karik/Numerik and Mark Levinson No.30). There wasn't the sense of relief when the music stopped or was turned down—always the sign something is wrong with a product. Instead, there was the urge to turn the music up and keep listening.

In short, the Trio was superbly musical. I eventually had a hard time putting my finger on what the Trio does that makes music so compelling, but its fundamental ability to involve the listener in the music was extraordinary and without question.

Moving on to the specific performance attributes, the Trio's most salient characteristic was its laid-back presentation. The music seemed to exist more behind than in front of the loudspeakers. The treble was exceptionally smooth and free from digital hash. The white-noisy grain that often overlays the tre-

ble was mercifully absent. Further adding to the relaxed presentation, the Trio had noticeably less high-frequency energy than other digital processors, yet didn't sound closed-in in the top octave. Instead, it rendered HF-rich instruments with a warmth and naturalness reminiscent of good analog. There was, however, a reduction in high-frequency detail when compared with, say, the Kinergetics KCD-55 Ultra. Through the Trio, fine detail tended to be more subdued than salient. This characteristic is perhaps partly responsible for the Trio's unfatiguing presentation, but I felt the KCD-55 Ultra presented more information to the listener. I should add that the Trio lacked an artifact I've heard from other Bitstream-based digital processors: a tendency toward treble hardness as level increases and on transient peaks (especially snare drum).

The mids were wonderfully warm, liquid, and lacking in hardness. Instrumental textures were soft and unforced, further adding to the overall sense of ease. Massed voices and instruments were more like curtains of silk than sacks of burlap. That analogy is an overstatement, but nevertheless conveys the Trio's remarkably smooth and natural portrayal of musical textures. There was no hint of the roughness or irritating brittle character many digital front ends impose on the music. In comparison with the KCD-55 Ultra, the Trio's midrange presentation was much more soft, liquid, and laid-back.

Bass presentation was reminiscent of another digital processor that uses the 7321 Bitstream chip: the Meridian 203. The Trio's bass was warm and full rather than taut and punchy. Its portrayal of bass was in line with the rest of its characteristics: a little soft, less precisely articulated, and with a distinct sense of bloom. This was very different from the bass presented by the No.30, the KCD-55 Ultra, Theta, and Wadia processors. Those products tend to have a rock-solid punch, tautness, and clear pitch articulation. The Trio also had less extension—that "center-of-the-earth" depth wasn't there—and was missing the sense of effortlessness and "snap" in the bass that characterizes the other processors mentioned. Although I preferred the bass rendering of these other processors, the Trio nevertheless conveyed the music's values.

I was particularly impressed by the Trio's resolution of space and soundstaging. The presentation was expansive, deep, and conveyed the sense of the recorded acoustic. Moreover, the apparent depth and width of the presentation changed with each recording. It was as though the Trio was accurately revealing what was recorded on the disc. On Robert Lucas's *Usin' Man Blues* (AudioQuest AQ-CD1001), a disc that can throw a palpable sense of space, the Trio was clearly superior to the KCD-55 Ultra. The acoustic surrounding Robert's guitar and vocal was beautifully fleshed out, seeming to envelop the instrumental outlines. The Trio also had a more immediate sense of Robert sitting in the listening room. On my guitar and bass recording from the first *Stereophile* Test CD, the instruments had more bloom around them, and the sense of space was greater and more like the actual acoustic of Santa Fe's Loretto Chapel where the recording was made. On CDs in which the space is generated electronically—Ahmad Jamal's *Crystal* (Atlantic 781793-2), for example—there was a greater expansiveness and feeling of openness. Moreover, the Trio presented music as individual instrumental images, not one synthetic continuum in which all outlines are homogenized.

In one sense, the Trio's presentation of dynamics was excellent; in another, it was merely ordinary. The first aspect in which the Trio was superb was in its ability to convey the fine dynamic structure of music. This includes, for example, reproducing hand-held percussion (not a drum kit) with an immediacy and sudden attack. The leading edge of small-scale transients gave music an immediacy and vibrancy. In the second meaning of dynamics—sheer slam and overall impact—the Trio was not on the same level as the other processors mentioned. The Trio lacked the explosive dynamics that give a drum kit, for example, a live feel.

When I forced myself to listen analytically, the Trio seemed good (especially its portrayal of instrumental textures and freedom from HF hash), but not outstanding. It was only when I listened for the sake of the music that I found myself enjoying the Trio immensely. Every time I fired up the Trio, I had the same reaction—forget about reviewing and enjoy the music. This is perhaps the best testimonial to the product. Prospective purchasers auditioning the Trio are therefore advised to spend some time with their favorite music,

not the dealer's audiophile demonstration discs. It is only when the music—not the sound—is paramount that the Trio rises from the good to the superlative.

MEASUREMENTS

The Trio put out 2.21V when decoding a full-scale 1kHz sinewave. This is slightly higher—0.5dB—than the CD standard of 2V, but typical of most CD players and D/A converters. Commendably, both channels had identical output voltages.

Frequency response (fig.1) was flat, but exhibited some ripple in the passband as a result of the digital filtering performed by the SAA7321 Bitstream chip. The rolloff of 0.25dB at 20kHz is negligible, while the de-emphasis error (not shown) was virtually nonexistent. The left and right traces in fig.1 overlap perfectly, confirming the perfect channel balance.

Looking at the Trio's reproduction of a full-scale 1kHz squarewave (fig.2), it exhibits the typical shape of the linear phase digital filter found in the 7321 Bitstream chip.

The channel separation curves (fig.3) revealed good channel isolation (110dB left to right, 115dB right to left at 1kHz), but had an unusual decrease in the low frequencies. This type of curve is usually indicative of low-frequency power-supply-related noise at 60Hz, 120Hz, and 180Hz. Here's why: In the channel separation measurement, one channel is driven and the other channel's output is measured and plotted. Any noise present in the undriven channel will thus appear as a decrease in channel separation at the noise frequency.

Fig.4 confirms this diagnosis. The plot is a spectral analysis of the Trio's output when decoding a -90.31dB 1kHz sinewave. The power-supply-related noise is apparent at 60Hz, 120Hz, 180Hz, and so on. Many processors have this kind of noise if the grounding between the unit and the Audio Precision System One is not optimized for the unit. I thus tried every conceivable grounding connection between them—cheater plugs to lift the mains ground, every possible grounding variation between the units, with and without the power supply's front-panel ground-lift switch activated. No matter what I did, the power-supply frequency components appeared in the spectral analysis. A spectral analysis of the Trio's output when decoding a test track of digital silence (all encoded data words are zero) shows the power-supply-related noise in the lower portion of the audio spectrum, but no converter artifacts or idle tones (fig.5). Note that the upper-frequency limit of this test is 200kHz.

In addition to skewing the results of the channel-separation test, the low-frequency noise also made the Trio's linearity error appear much worse. As can be seen in fig.6, the apparent positive error increases as the level decreases. This is not conversion error in the DAC, but the noise seen in fig.4. This is confirmed by the fact that the dotted trace in fig.4 (right channel) is lower in noise amplitude, and the right channel has less apparent "linearity error" in fig.6.

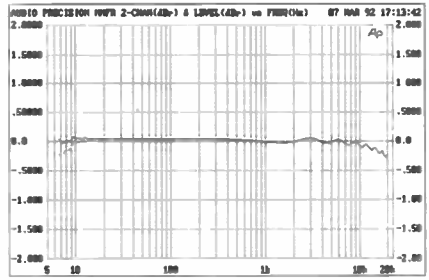


Fig.1 Micromega Trio, frequency response (right channel dashed, 0.5dB/vertical div.)

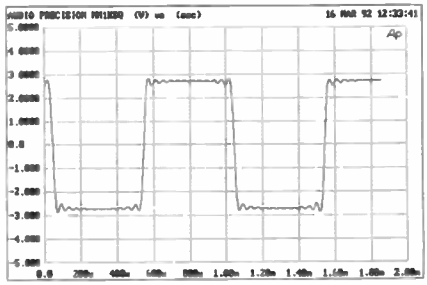


Fig.2 Micromega Trio, 1kHz squarewave at 0dBFS

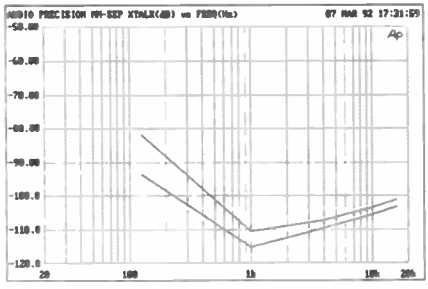


Fig.3 Micromega Trio, crosstalk (10dB/vertical div.)

The Trio's intermodulation spectrum when reproducing a combination of 19kHz and 20kHz at full scale is shown in fig.7. The 24.1kHz component (sampling frequency of 44.1kHz minus 20kHz) is fairly high in level, being 52dB below the test signal. Using a new technique described in last February's *Stereophile*, I measured the Trio's noise modulation (fig.8). In this test, the converter is driven with the code representing a 41Hz sinewave at four levels (–60dBFS, –70dBFS, –80dBFS, and –90dBFS). A spectral analysis of the converter's output is performed and plotted as noise *vs* frequency. The ideal D/A converter would have perfectly overlapping traces and a decreasing noise floor as frequency decreases. The Trio had a higher-than-average noise level, and the tightness of the traces was only moderately good. For some comparison noise-modulation curves and a full explanation of the technique, see pp.143–145 in our February '92 issue.

The Trio's reproduction of a –90.31dB 1kHz sinewave, captured by the Audio Precision's 16-bit A/D converter, is shown in fig.9. It has a slightly unusual shape in that the negative-going portion of the waveform appears a little like a spike.

Unusually, the Trio doesn't invert absolute polarity when the front-panel switch is in the invert position and the LED indicates "180°." I knew about this for some of the

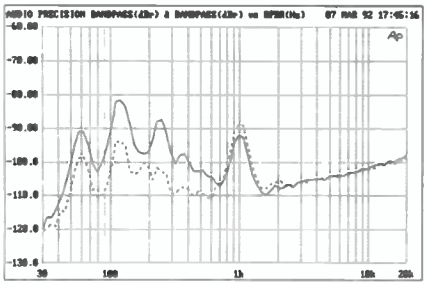


Fig.4 Micromega Trio, spectrum of dithered 1kHz tone at –90.31dB with noise and spuriae (⅓-octave analysis, right channel dashed)

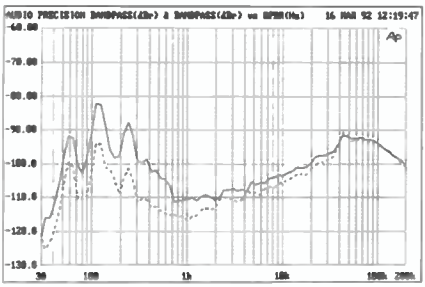


Fig.5 Micromega Trio, spectrum of silent track, 30Hz–200kHz with noise and spuriae (⅓-octave analysis, right channel dashed)

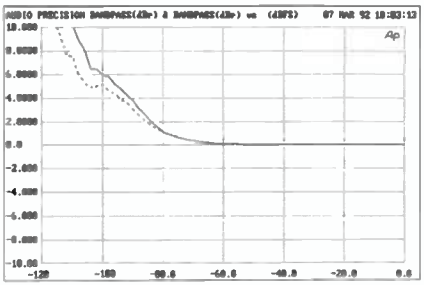


Fig.6 Micromega Trio, departure from linearity (right channel dashed, 2dB/vertical div.)

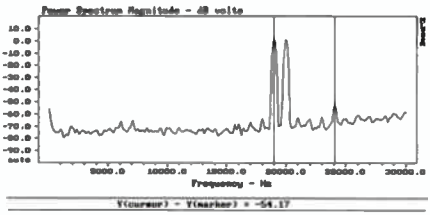


Fig.7 Micromega Trio, HF intermodulation spectrum, 300Hz–30kHz, 10+20kHz at 0dBFS (linear frequency scale)

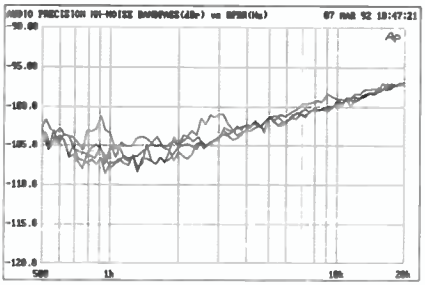


Fig.8 Micromega Trio, noise modulation, –60 to –90dBFS (5dB/vertical div.)

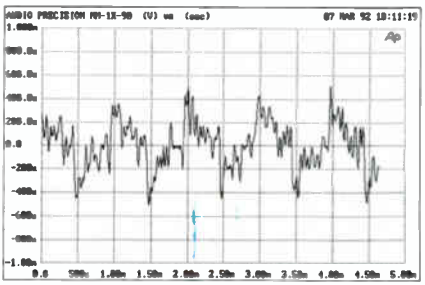


Fig.9 Micromega Trio, undithered 1kHz sinewave at –90.31dB

auditioning and compensated for it when making direct comparisons with other digital processors. Output impedance was a low 7.5 ohms at 20Hz and 8.6 ohms at 1kHz, rising to 18.4 ohms at 20kHz. This low output impedance suggests the Trio will work well with passive level controls.

When playing the Pierre Verany test disc, which has intentional dropouts in the digital data stream to test the CD player's error-correction ability, the Trio played track 30 but stumbled on track 31. As the track number increases, the dropout severity also increases. The higher the track number the player will play without glitching, the better its error correction. The Trio was only fair in this regard; some players get through track 33 or 34.

Finally, I measured a very low level of DC at the output: 200μV at the left channel, 1.1mV at the right.

CONCLUSION

The Micromega Trio is one of those rare products that grabs you musically and won't let go. Paradoxically, the Trio was forward, immediate, and incisive musically, yet smooth and laid-back sonically. Specifically, the Trio's treble smoothness and fundamental musicality made for long, fatigue-free listening sessions. In the individual areas usually used to judge digital processor quality, the Trio was good: the treble was free from hash, midrange textures were rendered with a natural warmth, and the soundstage was expansive. None of these specific attributes, however, could account for the special bond created between music and listener that I experienced with the Trio. It seemed to create a more direct path between the listener and the music's expression. I had some great times with the Trio in the system.

While I liked the Trio, it was not in the same league as the Mark Levinson No.30, a processor clearly in a class by itself. However, I found myself enjoying music more through the Trio than the KCD-55 Ultra driven by a Theta Data (a comparably priced combination), despite the latter processor's obviously greater strengths in bass impact and articulation.

Finally, the Trio isn't a product for tweakers. Although it allows experimentation with different digital interconnects, the product should be thought of as a CD player, not a transport and processor that can be used with other transports and processors.

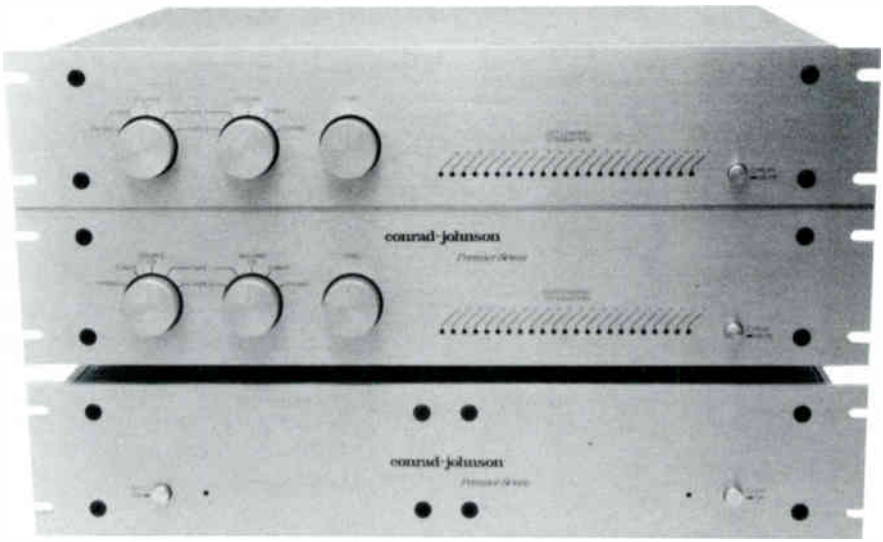
If you want a digital front end with which you can forget about everything except the music, the Micromega Trio may be just what you're looking for. **S**

CONRAD-JOHNSON PREMIER 7A PREAMPLIFIER

Jack English

Vacuum-tube dual-mono preamplifier. Inputs: phono (MC or MM), tuner, CD. Tape: 2 sets of inputs and 2 sets of outputs. Outputs: 2 sets, both phase-inverting, recommended for amplifiers with input impedance of 10k ohms or higher. Level control: 23-position stepped attenuators with front-panel LED level indicators. Tube complement: two 6CW4s and four 6GK5s per channel. Phono section: 40dB gain; overload in excess of 150mV at 1KHz; RIAA equalization ±0.25db (20Hz-20KHz); hum & noise 80dB below 10mV input. Line-level section: 29dB gain; 20V maximum output; bandpass, 2Hz to more than 100kHz; hum & noise 88dB below 2.5V output; distortion less than 0.25% THD or IMD at 1V output; output impedance less than 200 ohms. Dimensions: audio chassis, 19" W by 7" H by 16⅜" D; power supply, 19" W by 3.5" H by 16" D. Net weight: 60 lbs. Price $8950. Approximate number of dealers: 75. Manufacturer: Conrad-Johnson Design, Inc., 2800R Dorr Avenue, Fairfax, VA 22031. Tel: (703) 698-8561. Fax: (703) 560-5360.

Conrad-Johnson launched the all-tube Premier 7 in 1988 as an all-out sonic assault on the state of the preamplifier art. A great deal has happened since then. For starters, C-J has gotten a great deal of feedback from customers, dealers, and reviewers. None other than J. Gordon Holt (*Stereophile*, November 1988, Vol.11 No.11) concluded that: "It appears that nothing which could possibly have improved its sound had been omitted. . . . It is, in fact, about as close as any tubed preamp has come to being perfectly neutral in sound —in nearly all respects." In the now-defunct *Sounds Like*. . . (issue 3), Sam Burstein con-



Conrad-Johnson Premier 7A preamplifier

cluded that "It is, with certain reservations, absolutely delightful to one's musical senses." And, speaking of absolutes, even Harry Pearson gave the Premier 7 a rave in the first round of his preamplifier survey (*TAS*, issue 58). As icing on the cake, John Atkinson (*Stereophile*, Vol.12 No.8) concluded that the 7 had "the requisite degree of sonic magic to make it a Class A recommended preamplifier."

In spite of universal bottom-line accolades regarding the original 7's sonic performance, there were criticisms, the most significant focusing on the 7's inconvenience in use. And, to a lesser extent, various reviewers disagreed on certain aspects of the 7's sonic performance. But for all practical purposes, C-J had clearly achieved their primary objective of offering a preamp that was at the cutting edge sonically.

Meanwhile, C-J continued to learn from the development of other products, and the competition continued to improve. The time had come for a revision. Impressively, C-J has hung tough with their stated objective of concentrating primarily (if not exclusively) on sonic excellence, avoiding ergonomic improvements if they thought such changes would threaten the sonic integrity of the basic design. I think it important to review the criticisms of the 7 to gain the necessary insights into what C-J has created in the 7A.

TECHNICAL BACKGROUND &

ERGONOMICS

JGH discussed at length the Premier 7's technical parameters in Vol.11 No.11. I suggest rereading that description, which remains germane to the 7A; Gordon has done a much better job of tackling this monster product's technical aspects than I could.

There have been two significant changes to the 7. Based primarily upon things learned in the development of other products, C-J has revised the phono stage—the only audio circuit change—and built in line filters based on the opinion that "cleaning up the line is a good thing." But what about all of those ergonomic issues raised by prior reviewers?

• Dual Volume Controls: While two volume controls may be inconvenient, they are essential for a true dual-mono design; the revised model retains them. This also holds true for the separate power cords, on/off power switches, and mute switches. On the other hand, LED indicators are provided for each channel, making accurate channel volume-matching relatively straightforward.

• Stepped Attenuators: Anything discrete will never be continuous. Even if the number of steps were increased from 23 to 100, someone would invariably want a position between two of the settings. The number of steps was not an issue for C-J; the choice of stepped attenuators was. C-J regards the resistive elements of potentiometers to be sonically inferior and, by using stepped attenuators,

has minimized the number of switched contacts in the signal path. The 7A has only a single pair of resistors in the signal path at any time. Their attenuators are neither ladders of resistors nor simply detented potentiometers. While JA found the steps to be too large, I didn't find them to be a problem using either phono or line inputs—with the exception of the very high output Theta DS Pro Generation II.

• Phase Inverting: The 7A's line stage inverts polarity. Another amplification stage would be needed to provide a phase-switching capability, but would compromise the sound; C-J overruled it. If nothing in your system inverts polarity, the inclusion of the 7A will change the system's overall phase. You can simply reverse the leads at your speakers. If your system includes crossovers, separate amps, and/or subwoofer(s), things get a bit more complex. An alternative solution is to simply use the 7A with the C-J Evolution 2000 amplifier, which also inverts polarity.

• Physical Size & Weight: The 7A wasn't designed to be any specific size or weight, but to provide the best possible sound. This held true for the selection of numbers and quality of internal parts, layout, physical construction, etc. A glance inside the unit will make it clear that the available space is well utilized. Still, it's big; shipping weight of the *three* separate chassis is 60 lbs.

• Phono Impedance Selection on Rear of Unit: First, there *is* a phono impedance selection option; this is not a standard feature on all preamps. Second, while it may be on the rear of the unit, it *is* on the outside. For the amount of times this feature should be used, placement on the rear of the unit should pose no great inconvenience.

• Lack of an A+B Mono Switch: While Gordon complained about the lack of this switch, few others do. Lew Johnson told me that he's had only one other such request, on a different product, in 15 years. Listen to your mono records in stereo. The inclusion of an A+B switch would defeat the paramount objective of the true dual-mono design.

• Tape Feedback: No changes have been made to correct this problem identified by JGH in his review. As he described, you can, under certain conditions, experience feedback while taping and switching. Trusting Gordon's explanation, I didn't try to create this feedback.

• Noise: No, the 7A is not dead silent, or even as silent as most solid-state preamplifiers. But relative to most other tubed preamps, it's very quiet. I must point out that most tubed preamps today are significantly quieter than those of a number of years ago. I didn't find the noise to be a problem, but I've been using tubed preamps for a long time.

• Replacing Tubes: While no other reviewer has mentioned this, I feel I must. Replacing tubes in the 7A is a big pain in the butt. The biggest problem is replacing any of the tubes in the right channel. Of the 7A's three chassis, both power supplies are in one box, the left- and right-channel circuitry in the remaining two. However, the left-channel box is fastened to and above the right-channel box. While getting at the innards of the power supply or left-channel circuitry is no big deal, access to the right-channel sockets is difficult enough that I advise having your dealer replace the tubes.

SOUND: 7 VS. 7A

The reviews of the 7 mentioned above presented a fascinating picture of the original Premier 7's sonic performance, areas of general agreement alternating with conflicting opinions. All of the earlier reviews praised the Premier 7 for its superlative soundstaging, ability to recreate spaciousness, and outstanding dynamics. My first concern was whether the 7A had done anything to impair these stellar attributes of the original 7.

Soundstaging: Prior reviews consistently praised the 7's soundstaging, especially its recreation of layers of depth. The 7A has lost none of this wonderful soundstaging ability. Listening to the superlative Athena reissue of Rachmaninoff's *Symphonic Dances* (ALSW 10001), the Dallas Symphony Orchestra occupied a wide, deep soundstage located around and behind my speakers. Clear delineations of different physical spaces were made for each orchestral section. There was no wander or vague positioning.

Results through only the line stage were identical, the must-have Chesky Test CD (JD37) verifying the 7A's soundstaging excellence. There was Bob Enders in the center, then halfway between the center and right channels; then coming out of the right speaker, etc. Yes, there were Bob and David Chesky just behind the speakers at center

stage; then slightly further back, then still further back, etc. Soundstaging width and depth were excellent through either the line or phono stages; nothing whatever was lost in the revision.

Spaciousness: The second area in which the original reviewers agreed concerned the preamp's ability to recreate air, space, and ambience—those ever-so-critical cues of real musicians performing in real spaces. The combination of the Athena recording and the 7A was once again a marvelous illustration of this particular strength. There was a sense of actually being transported to the McFarlin Auditorium of Southern Methodist University, with a sense of space around the performers as well as a sense of the hall itself. The mixture of direct and reflected sounds, coupled with the decaying reverberations from the hall, transported me from my own listening room to the SMU campus.

Returning to the line stage with the Chesky CD, the sense of air and spaciousness on the test tracks was equally realistic. It became crystal-clear when sound segments were turned on or off. When a sound was naturally recorded in a real space, you could *hear* that space. On the "Viola Fora De Moda" track, all of the 7A's soundstaging, spaciousness, and dynamics capabilities came together to convey the performance's realism. The recreation of spatial information remained outstanding through the 7A's phono *and* line stages.

Dynamics: A third area of reviewer consistency related to the original 7's dynamic performance: in short, splendid. The 7A has lost none of this superb dynamic capability. Once again, the Rachmaninoff recording provided a wonderful illustration due to the recording's remarkable dynamics. The 7A was equally adroit at recreating the softest through the loudest passages. The most subtle volume shifts became audible and captivating. David Chesky's tambourine quickly answered any questions concerning dynamics through the line stage. The sound was very fast, very clean, and wonderfully dynamic. Whatever else may have been done to the 7A, nothing has been done to harm the original 7's marvelous strengths. Soundstaging, air/spaciousness, and dynamics were absolutely stunning. In these areas, Conrad-Johnson has indeed achieved their stated objective of assaulting the state of the art.

PRIOR REVIEW INCONSISTENCIES

Bass: Where the original reviewers disagreed on the 7's performance was in the area of tonal character. Starting at the bottom: HP felt the 7's lows were fabulous, with excellent power and articulation; JGH, however, thought there was a slight thinning out below 50Hz; and JA found a "tad too much bass energy." JA's measurements of the 7, however, showed it to be remarkably flat. The 7A does use polystyrene coupling capacitors (4μF). If the amplifier used has a low input impedance, there could be some softening of the deep bass as well as a slight phase shift. Given this interactive effect and the measured accuracy, it's likely that the bass anomalies heard by the different reviewers were attributable to the interaction between the preamp and different power amplifiers.

In my own listening tests, I found the bass performance first-rate. Deep bass was extended and powerful, midbass rich and dynamic, and upper bass was consistently clean and detailed. I formed these opinions listening to music, but tested them using a series of test tones from *The Ultimate Test CD* (Woodford Music, WM CD 1112). With my beloved ProAc Response Threes and my problematic-in-the-bass listening room, I had very strong and flat response down to 60Hz. I estimated the speaker's usable response to be down about 3dB at 40Hz. At 30Hz, the response was audible but significantly lower in level. More interesting, the 20Hz tone was audible, if just barely. Such results imply a tube-like attenuated bass. Fortunately, I also had the Kinergetics SW-800 Subwoofer System on hand (reviewed in Vol.15 No.3). With these monsters, the Premier 7A had absolutely no problem whatsoever in reproducing the 20Hz note as loudly as the 60Hz one. If you don't hear the deepest bass with the 7A in your system, there's something wrong in your system or listening room.

While bass performance with the 7A was indeed deep and powerful, it still exhibited vestiges of the character first identified by JA. While I'm sure that Tom Norton's measurements will show a flat response, there *is* a very minor trace of tube-like bloom in the mid- and deep-bass regions. A good illustration

of this effect can be heard on the gone but not forgotten *Toto IV* (Columbia PC 37728). The bass was just a smidgen richer, rounder, and fatter than the rest of the frequency spectrum, where every other sound was pristinely clean and super-quick. This is *not* to say that the 7A has tube-like bass—it has a remarkably impressive bass that gives virtually no indication of tubes at all—it's just that the character of the bass is very slightly different from the rest of the frequency spectrum.

Midrange: JGH felt the 7 to be "essentially perfect" in the midrange; HP described the performance as having a "tan" coloration; SB felt the lower mids were warm, with a lack of midrange detail and an overall smoothing-out of sounds; and JA described the midrange as clean and detailed.

I had no problems tackling this mini-controversy, as my system is particularly adept at recreating midrange information. What I found was that what most of these reviewers described—with the exception of *Stereophile*'s own JA—simply does not apply to the 7A. The 7A is, as John described, exceptionally clean and detailed through the midrange. In fact, it is in this region that the 7A deviates significantly from the traditionally warm "C-J sound."

Many tubed preamps can be described as being somewhere on the warm, musical, rich side of neutral. The 7A certainly isn't one of them. If anything, it sounds slightly analytical, favoring accuracy over euphonic colorations. Once again, what I heard through the 7A was very much what JA heard through the original 7. The midrange was phenomenally clean and detailed for a tubed product. With relatively simple music without a great deal going on, every little nuance is laid bare. A good example is Marianne Faithfull's *Greatest Hits* (London PS 547), which the 7A dissected surgically. Unfortunately, a lot here is better off hidden. Any trace of the 7's supposed caramel coloration would be greatly appreciated with this recording, but there was none to be found using the 7A.

With more complex material, such as The Art of Noise's *The Fon Mixes* (China WOL 1023), the 7A's ability to unravel information is uncanny. This two-LP set proudly proclaims: "Cut extra-loud at 45rpm for extra noise." The 7A can handle this with no difficulty. It can play it loudly or softly, in either case continuing to keep every note, voice, and line crystal-clear. There is never any confusion, haze, or muddy loss of information.

Since the 7A's avowed intent is to assault the state of the art, I've elected to judge it accordingly. Using this essentially impossible standard, the 7A's midrange offers unsurpassed articulation, detail resolution, and transient speed. But compared to someone performing in your listening room, the 7A is ever so slightly thin in timbral recreation. This is most obvious with the human voice, as in the Marianne Faithfull or Toto recordings. A better example, with more demanding vocals, is The Manhattan Transfer's stunning remake of "Gloria" from their 1975 debut album (Atlantic SD 18133 0698). While the harmonizing vocals are delineated with marvelous clarity, they fall just short of the timbral richness of a live performance. Honestly, I've just got to get one of the newer Benz Micro or Koetsu cartridges to be sure how much of this thinness is attributable to the preamp.

Treble: JGH was very favorably impressed with the 7's trebles; JA said they "soared"; and HP felt there was a trace of high-treble distortion. C-J itself felt that there may have been some minor treble shortcomings in the phono stage. Since it's difficult to tell how much different reviewers used the phono inputs, it's impossible to attribute their disagreements solely to the performance of the phono stage. Nonetheless, C-J feels any possible treble shortcomings have been eliminated in the 7A's revised phono circuitry. My own hearing was the limiting factor here, as opposed to any shortcoming in my system or listening room. The latter measures flat well out beyond 20kHz, though I can only affirm that via test instruments. Using the Woodford CD and a Radio Shack spl meter, the 7A was still putting out plenty of energy through my system at 20kHz.

The 7A left me a bit confused about the quality of this extended treble performance. With some recordings I heard a very slight hardness or distortion; with others, I heard nothing wrong. I may have more treble problems with some of my LPs and CDs than I thought, which the C-J let me hear for the first time; or there may be some very minor anomaly in the 7A's treble region. However,

the 7A did nothing to further exacerbate already "hot" recordings such as Anita Baker's superb *Rapture* (Elektra E1 60444). The hot trebles were pretty much as I expected, with no additional exaggeration or distortion. Everything else was wonderful: the big, powerful bass, very wide and stable stage, and first-rate resolution of detail. But Anita's voice could have been just a tad richer and fuller.

PUTTING IT ALL TOGETHER

The 7A was out of my system for a while during the course of its rather lengthy review process. I put it back, along with my reference ARC Classic 150s. Onto the Versa 1.0/Benz combo went Michael Doucet and Beausoleil's *Bayou Boogie* (Rounder 6015). Unlike much of Beausoleil's earlier work, *Bayou Boogie* is "electrified." While the music remains predominantly acoustic, with accordions and fiddles, there are amplified instruments as well. This Cajun Zydeco music is wonderfully happy-go-lucky. The performance sounds like something you might hear in a local town hall or VFW building. It's natural, exciting, and carefree. You want to call up some friends to have a party.

The 7A didn't draw attention to itself. The performers were placed precisely on a wide stage, back, between, and well behind the speakers. The timbres of the acoustic instruments were natural; the sonic performance was quick, fast, detailed, clean, distinct, and tight. No matter how complex the music became through the performers' exuberance, it never sounded muddled or confused.

As I shifted my attention away from the music and back toward the equipment, I did feel there was something slightly amiss in the trebles. Triangles, in particular, were just a bit hard, their decay a tad foreshortened; but you really had to listen for these effects to hear them. However, listening to gravelly-voiced guitarist extraordinaire Chris Rea (*New Light Through Old Windows*, Geffen GHS 24232), the treble was admirable. Various cymbals and bells were clear and quick, with nary a trace of hardness or distortion. No matter how I attempted to resolve the treble issue, I just haven't gotten it done. There *may* be a mild coloration in the upper reaches; I'm still not certain.

After finishing up some new listening to the phono stage, I went back to the line stage using digital. Since I'd been enthralled with a rave *Rolling Stone* review by Michael Azerrad, I spent an evening with the latest release from My Bloody Valentine. Azerrad described the music on *Loveless* (Sire 26759-2) as that which "must signal some sort of impending revolution." He went on to quote Brian Eno as saying *Loveless* "sets a new standard for pop." My audiophile juices ran even higher—the SPARS code read AAD! I couldn't wait.

Ecch! Forget the treble question. This stuff was dreadful. The *music* gave me a headache; the sonics were much worse. Actually, the credits told the story on this one: four artists, *eighteen* engineers and assistant engineers! That's 4½ engineers per artist! Every second of this dreck is processed, manipulated, and screwed up in some way or another. The sounds are distorted, confused, discordant, hard, bright, and unclear. The everywhere guitars are tremelo'd, whammied, vibrato'd, and fuzzed into a hazy, muddy mess. The lightweight, wimpy little Kate-Bush-wannabe vocals just don't fit. There is no attempt whatsoever at recreating any type of soundstage, and there are only bare traces of natural timbres. It is as if the entire recording was made on a cheap tape recorder that was on its deathbed. Still, amid all of this engineering prowess, a relatively natural-sounding drum kit survives. The 7A's ability to unravel and reproduce all of this detail let me hear everything that was going on. If the source is lousy, that's just what you'll hear with the 7A. There is absolutely nothing euphonic about the preamp's presentation. As far as *Loveless* is concerned, that's too bad.

Maybe I'm a glutton for punishment. The other CD I'd put aside for this particular listening session was from Univers Zero (*Heatwave*, Cuneiform Rune 9CD). I got this one from Ken Golden at The Laser's Edge, who described UZ as "the chamber ensemble from Hell." Rather than starting at the beginning, I opted instead to begin with "The Funeral Plain," the 20:24-long final track. UZ relies on a musical foundation of traditional acoustic instruments—clarinets, saxophones, violins, violas, pianos, percussion, the human voice—augmented by guitars and synthesizers. When I hear a melody begin, I often try to hum the *next* note in anticipation of where the music is going. Whew! What an experience with UZ. Many melodic lines seem to end on strange notes

—either flat or sour sounds following sweet melodies. It's like biting into a lemon. UZ's moods are dark, foreboding, filled with tension; they made me uncomfortable. Often, I found myself literally sitting on the edge of my seat. This is an experience I normally only have with some form of visual or multimedia event. Listening to this music is similar to becoming absorbed in an Alfred Hitchcock movie. Quite a thrill. Once again, as with every other CD and LP thrown at it, the 7A simply let the music play.

THE ULTIMATE CHALLENGE

John Atkinson, Bob Harley, Tom Norton, and Corey Greenberg—three professional audio critics and one professional audio engineer—happened to be in New York for the Fall 1991 AES convention. They graciously made time in their hectic schedules to pay me a visit. As a group, we spent hour after hour listening to LP after CD after LP. One selection led directly to another. We talked and listened to *music*! We never bothered discussing equipment. The system consisted of a Benz Micro MC-3, Versa Dynamics Model 1.0, Magnan Type Vi interconnects, Theta Data, Kimber KCAG (as a digital cable), Theta DS Pro Generation II, bi-wired ARC LitzLine 2 speaker cables, ProAc Response Threes, dual Tice Power Blocks and Titans, and the Conrad-Johnson Premier 7A preamplifier and Evolution 2000 amplifier. The system just stayed out of the way. The Premier 7A (as well as all of the other equipment in the system) did an admirable job of playing music. This is the ultimate compliment paid to any audio gear.

TJN ADDS SOME MEASUREMENTS

Before I began measuring, I noted that the mute switch on the Premier 7A's left channel was defective. It would stick in one position. Pulling it out manually would release it, but it would then simply stick at the next engagement. Fortunately it stuck in the non-mute position.

The gain of the Premier 7A's line stage—from input to main output—measured 29.6dB in the left channel. The right-channel gain was 0.2dB lower. The line input impedance depended to a small degree on the channel and the setting of the volume control, but ranged from just over 18k ohms to just over 20.5k ohms. The main output impedance had a maximum value of 273 ohms (full volume), dipping to 177 ohms at lower volume settings (for the right channel; the corresponding values for the left channel were 247 and 166 ohms, respectively). A setting of 29 on the level controls gave the nearest approach to unity gain (within about 0.2dB).

The gain of the phono stage, with a 47k ohm load setting on the rear panel switches, measured at the tape outputs, was 39.3dB (L) and 38.5dB (R). With the input load reduced to 250 ohms—10 times the output impedance of the (Audio Precision) signal source—the gain was 35.7dB (L) and 35dB (R).[1] With the latter load, a 0.5mV input to the phono stage resulted in 1.1V (L) and 1V (R) signals at the *main* outputs.

Fig.1 shows both the line-level frequency response and the RIAA phono response of the Premier 7A. The former are the virtually straight curves; the latter show only a very slight rolloff at low frequencies and a broad but very minor dip in the 1kHz area—overall, a superb result. In fig.2, the bottom two curves show the line-level crosstalk at full output (level control at maximum; crosstalk measurements made with an input of 100mV). The upper curves show the crosstalk with the level control set for unity gain. In both cases, the topmost curve is the crosstalk from channel A to channel B, the bottom from B to A.

A further reduction in separation was measured at a level setting of 47 (roughly corresponding to 9 o'clock on a rotary control), giving a minimum of 66dB to 5kHz and 62dB from 5kHz to 20kHz (not shown). This suggests that the leakage from one channel to the other is occurring before the volume control. Note that the rise at higher frequencies—usually indicating capacitive coupling between channels—is less pro-

1 A reader recently asked whether it was a rule of thumb that, as you lower the load impedance at the cartridge input, the dynamics and treble response deteriorate. No, it is not. If a cartridge has an output impedance (more appropriately known as the source impedance) of 5 ohms, then an appropriate load for this cartridge would be several times this amount; say, 30 ohms (these are actual source impedances and the manufacturer's recommended loading for a Dynavector XX-IL). It's unlikely that a small decrease or significant increase from this value (say, 20 to 100 ohms) will affect either the measured frequency response or the audible dynamic qualities of the cartridge—though it may have some impact on other factors (distortion, for one).

A few years ago, with this question in mind, I checked out the effect of such a change in loading on the measured frequency response of a cartridge. The result? Zip, *nada*. I would not call *this* result a rule of thumb, only verification that the reality of the situation is a bit more complicated. —TJN

nounced at higher frequencies than we often see. I also noted that the crosstalk varied somewhat with the degree of warmup, at its best when just turned on. The curves shown were taken after an "on" time of about 2 hours.

The phono crosstalk, assessed at the tape outputs (fig.3), is superb. Note that in this case there is almost no capacitive-coupling rise at higher frequencies. For all practical purposes, crosstalk from A to B is the same as from B to A. (The A–B curve is the one with a minimum at the 500Hz point.)

THD+noise is shown in fig.4. The second curve from the bottom is the THD+noise from the phono stage at an input of 5mV. The top curve is the line THD+noise at full volume; the second from the top curve is the THD+noise at the "47" setting, the bottom curve the unity gain result. The 1% THD+noise level—measured from the line inputs to the main outputs—was reached at 164mV input, producing an output of 4.93V. The 1% THD+noise level for the phono input—with an unequalized input and measured at the tape outputs—was reached at 79mV at 1kHz (7.19V output), 7mV at 20Hz (5.75V output), and 240mV at 20kHz (2.33V output). Recall that the change in overload voltage levels due to frequency, a natural consequence of the requirements of the RIAA playback curve, is common to all preamps we have measured. With the RIAA pre-emphasis taken into account, these voltage figures represent margins compared to the standard phono input of 5mV at 1kHz of 24dB, 23dB, and 13.6dB, respectively, which are excellent, excellent, and merely good.

Finally, the Premier 7A inverted polarity from the line inputs to the main outputs, but did not from the phono inputs to the tape outputs. (It therefore inverted from phono in to main out). The DC offset fluctuated between 0mV and 1.6mV in the left channel, perhaps indicating the presence of very low-frequency noise in this channel, but was zero in the right channel. —**Thomas J. Norton**

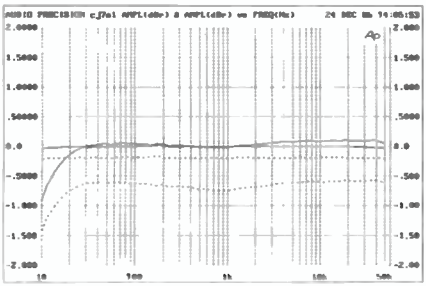


Fig.1 Conrad-Johnson Premier 7A, line stage frequency response (flat curves) and RIAA deviation (right channel dashed, 0.5dB/vertical div.)

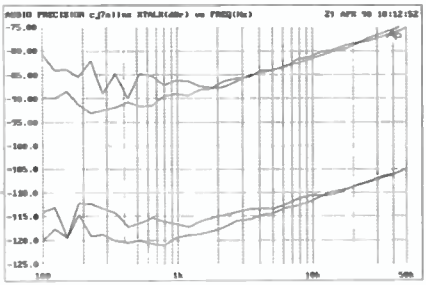


Fig.2 Conrad-Johnson Premier 7A, line stage crosstalk with volume control full (bottom curves), and at unity gain (top curves, 5dB/vertical div.). Measurement probably dominated by noise.

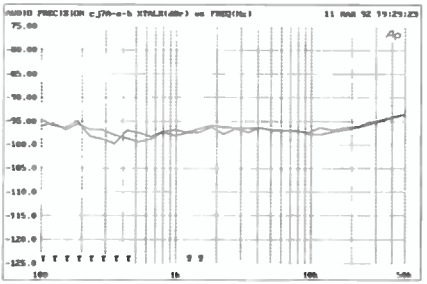


Fig.3 Conrad-Johnson Premier 7A, phono stage crosstalk (5dB/vertical div.). Measurement probably dominated by noise.

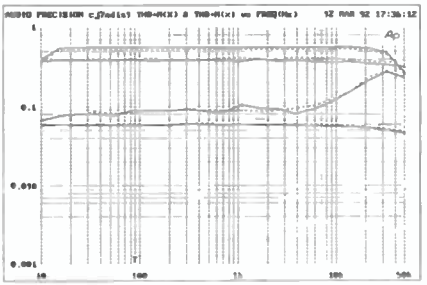


Fig.4 Conrad-Johnson Premier 7A, THD+noise vs frequency for line stage at full volume (top curves); the line stage at the "47" volume control setting (second from the top curves); line stage at unity gain (bottom curves); and phono stage (second from bottom curves).

JE CONCLUDES

First, the design tradeoffs necessitated by the Premier 7A's sole reason for being—sonic performance—make the 7A definitely not the most convenient preamplifier to use. If convenience is high on your agenda, look instead at the remote-controlled preamps from Rowland, Krell, and Berning.

Second, the 7A is extremely expensive, costing $4000 more than the splendid Convergent Audio Technology SL-1 Signature. The lofty price reflects the effort, parts, build quality, and limited production commensurate with such a design.

Third, the 7A is a tubed unit. No matter how carefully you treat any tubed unit, tubes wear out, fail, and have to be replaced. To prolong tube life, the unit cannot be left on all the time like solid-state gear. Every time it's turned on, you'll have to wait a while before the 7A will perform optimally. Changing the 7A's tubes is a pain in the butt. And, while the 7A is remarkably quiet for a tube product, it's noiser than a comparable solid-state design.

The 7A has lost none of the superlative sonic strengths found in the original 7. Like the 7, the 7A offers outstanding soundstaging capabilities; a wonderful ability to recreate air, space, and ambience; and first-rate dynamics that, as a result of the improved power supply, may be actually even better than the 7's. In comparison with musicians performing in my listening room, the 7A has: a trace of tube-like bloom in the bass; a slight loss of timbral richness in the midrange; and a very, very minor occasional hardness in the trebles. Improvements in the phono stage have reduced difficulties in the uppermost frequencies which plagued the original 7. Detail resolution is unsurpassed, as is the recreation of transients.

Following closely in the footsteps of earlier reviewers, I must say that the Conrad-Johnson Premier 7A is one of a handful of truly Class A preamps. **—Jack English**

BRYSTON 4B NRB POWER AMPLIFIER

Larry Greenhill

Bryston 4B NRB power amplifier

Solid-state stereo power amplifier. Output power: 250W continuous into 8 ohms (24dBW), 400Wpc rms continuous into

4 ohms (23dBW); 800W continuous into 8 ohms in bridged mode (29dBW). Current delivery: 16A continuous, 48A peak, per channel. Frequency response: 1Hz–100kHz, ±3dB for 1W output. S/N Ratio: hum and noise, 108dB below rated output, 90dB IHF. Input sensitivity: 1.4V for 250Wpc into 8 ohms. Voltage gain: 30dB. THD+noise: 20Hz–20kHz, 0.01%. IM distortion (60Hz+7kHz, 4:1, SMPTE method): less than 0.01% at rated power. Damping factor: greater than 500 at 20Hz, at 8 ohms (equivalent to an output impedance of less than 0.016 ohms). Input impedance: 50k ohms unbalanced, 30k ohms balanced. Polarity: non-inverting. Dimensions: 16 3/16" (411mm) W by 7 1/8" (181mm) H by 13 1/2" (343mm) D. Weight: 40.1 lbs (20.2kg) net. Price: $2095, $2295 with optional LED display; TXH-approved version costs $2245. Approximate number of dealers: 70. Manufacturer: Bryston Limited, 57 Westmore Drive, Rexdale, Ontario M9V 3Y6, Canada. Tel: (416) 746-1800. Fax: (416) 746-0308. US sales: Brystonvermont Ltd., RFD 4, Box 2255, Montpelier, VT 05602. Tel: (802) 223-6159. Fax: (802) 229-2210.

On January 1, 1990, Canadian electronics manufacturer Bryston instituted a remarkable warranty program that covered each of their products for a full 20 years. This warranty includes all audio products ever manufactured and sold under the Bryston name. Besides covering parts and labor costs, the company will also pay shipping costs one way. This is all the more significant for their 4B NRB amplifier, which has been in production since 1976. The amp's $2k price, while not cheap, is at the lower end of what well-heeled audiophiles typically pay for amplifiers.

The Bryston 4B NRB available in stores today incorporates a number of features not found in the original design. While 5 lbs lighter, its power-supply energy storage has been increased by 28% as a consequence of raising the rail voltages from 75V to 85V.[1] Power-supply impedance and IM distortion ratings have been reduced by a factor of four, and twin toroidal transformers have replaced the earlier E-I core transformers.

Having reviewed an earlier version of the 4B for *Audio* magazine (November 1985, Vol.69 No.11, pp.80–89), I was very interested when designer Chris Russell showed me this version at the 1991 Summer Consumer Electronics Show. Its extraordinary warranty and redesign were reasons enough for me to re-review this classic.

HISTORY

The Bryston 4B NRB amplifier became popular in early 1978, when *The Audio Critic* declared the then-$1195 amplifier "the best power amplifier we've been able to find so far" (Vol.1 No.4, p.41), praising it as an "unflappable voltage source with an unshakably tight bass response"—but only if warmed up for an hour. Never mind that it was found to be "just a wee bit hard and zippy compared to our current favorites" just two issues later (Vol.1 No.6, p.31); the audiophile community had been alerted. The other amps in that magazine's "search for the perfect audio amplifier"—the Futterman H-33aa, the db systems db-6, the 25Wpc Electrocompaniet, the Quatre DG-250, the RAM 512, and the Threshold 800A—have not been in production for over 15 years.

Bryston has since improved upon the 4B's design. A new output stage was added in 1985. My review that year praised the Bryston 4B's sonics for excellent channel separation and ability to establish a stable soundstage with uncanny directional cues. It had speed, bass control, and lots of "slam." Studio engineers and concert pros liked the Bryston 4B NRB for its ruggedness, reliability, and passing of the "steel toe" test.[2] Although it was a better-sounding product, it joined the Crown DC-300 as a standard tool for recording engineers and touring musicians.

NEW DESIGN FEATURES & CONSTRUCTION

The Bryston 4B NRB is a class-AB2 solid-state stereo power amplifier. Smaller than some of the monoblock amplifiers reviewed in these pages, its slim profile and 44 pounds belie its power capacity. Bryston rates this amplifier at 250Wpc continuous into 8 ohms, 400Wpc into 4 ohms, and 800W, bridged, into 8 ohms. Its compactness comes from using the whole chassis as a heatsink.

The 1991 Bryston 4B NRB has a totally redesigned front panel. Gone is the flat, 1/8", rolled-aluminum, dull, military black front

1 Because the energy storage of a power supply varies as the square of the voltage, the new 10V increase in rail voltage makes a significant impact on the Bryston 4B's power-supply capacity.

2 The "steel toe" test is a rigorous quality-control procedure. If the audio pro happens to be wearing boots with steel-toe caps, a firm kick checks whether the audio gear can handle the rigors of concert touring: bouncing around in the back of a van, being thrown up on a stage, falling out of a sound tower, etc.

panel; it's been replaced by a ¼"-thick sculpted rack-sized panel etched with two thin lines. The two front handles have similar grooves. This new panel is made of a single extruded aluminum piece, buff-finished with a fine abrasive like jeweler's rouge. The surface is now so smooth that one cannot leave a mark by rubbing a finger across the surface. The front panel features tri-color LED pilot lights, one per channel. These remain green while the unit is on, but flash first amber when a channel clips momentarily, then red for hard clipping. The square power pushbutton is the only front-panel control.

Rounded heatsinks line the amp's sides, not the back panel as in former Bryston 4Bs. This means that the chassis can be an inch deeper than before, permitting space on the rear panel for a number of new features. These include balanced XLR input sockets, toggle switches for floating or using the ground lead (on the three-prong cable), and a switch for choosing either single-ended or balanced inputs. These switches are greatly appreciated, particularly if you've ever misplaced the tiny U-shaped shorting pins that must be inserted in the XLR input sockets of some other high-end amplifiers (the Mark Levinson No.27, for one) to be able to use the power amp's single-ended RCA input jacks.

Opening the Bryston 4B requires a special screwdriver called a "Robertson." Bryston continues to use excellent threaded steel inserts and Robertson machine screws to attach the top panel. Internal fasteners and screws are used with locking thread-sealer to lower vibration and increase structural stability. As with the earlier models, the new Bryston 4B uses gold-plated board-edge connectors on driver and input boards. Soldered and otherwise gas-tight mechanical connections are used for signal circuits. Circuit boards are very high quality double-sided epoxy-glass, with component-designator screening. After assembly, Bryston amplifiers are bench-tested, then must undergo a rugged burn-in, being driven by a squarewave input signal into a capacitive load, slightly under clipping, for 100 hours. After this reliability check, the 4B is again bench-tested. The resulting printout is shipped with the amplifier. These features, as well as other elements of the amp's fit and finish, are consistent with the best instrument standards.

What's inside? The 4B's chassis houses two completely separate amplifiers, every part duplicated except for the single power cord and the back-panel bridging-circuit board. Also new in this version is a detachable AC cord, a vast improvement over the former heavy, coiled, nondetachable line cord. Two new toroidal transformers are located just behind the front panel, where they receive support when the amp is rack-mounted. Four small 4700μF electrolytic filter caps with higher voltage ratings are used in the 1991 Bryston 4B, instead of the earlier dual 10,000μF cans. Shorter lead lengths bring these filter caps to within an inch of the output circuitry.

The new 4B amplifier's power supply is a relatively "stiff" design, and has been designed to be relatively unaffected by big current draws. The rails are said not to sag from their ±85V, whether the amp is at 0 or 10 amps current draw.

The Bryston 4B's output circuit uses hand-selected devices with matched transistor betas. Chris Russell suggests that the 4B's output stage eliminates any small asymmetry in the zero-crossing region, particularly notch distortion, as well as resulting in a decrease in upper-harmonic distortion. He also claims that the design makes the output stage more tolerant of loading than conventional output-stage topologies.

I noted improvements in many small touches that confirmed the company's design philosophy of fine-tuning a good product rather than trying to produce a "new sonic breakthrough" each year. For example, input jacks are now soldered to their respective printed circuit boards, emerging through 14mm chassis holes which allow the push-on RCA connector sleeves to be inserted into the chassis, providing superior strain relief. Each pcb has heavier copper traces than before. A slow-start circuit has been added to avoid line surges when the amp is turned on. Compensation has been provided with the use of a single loop of wire in the output stage. The new toroidals are precision-wound with exactly the same length of double wire. Holes have been drilled into the chassis sides in the heatsink recesses to permit an unimpeded flow of air, even if the amplifier is placed on a carpet. Shorter lead lengths, a much lower-impedance power supply, and the new toroidal transformers have lowered the amplifier's

IM distortion by a quoted factor of four.[3]

SETUP

I strongly believe that an amplifier has to be auditioned over a long period of time. First impressions can be misleading, particularly if the amplifier is good.[4] For this report, the Bryston 4B NRB was involved in every one of my listening sessions for a solid five months.

The 4B drove a wide variety of loudspeakers, including dynamics (Snell A/IIIs, Bs, and Es), electrostatics (Quad ESL-63/USA Monitors), minimonitors (Sonus Faber Minima), and subwoofers (Quad/Gradient SW-63s). At different times, it was run single-ended and balanced, and used both as the upper-range and subwoofer amplifier in bi-amplified systems.

Reference amplifiers included a Mark Levinson No.27 and a Krell KSA-250. The Quad full-range loudspeaker system was used with its own Gradient crossover unit with balanced interconnects; the Type A/III Improved speakers used a Snell-manufactured outboard electronic crossover with single-ended connectors. Speaker cable included 15' runs of Monster Cable, paralleled runs of Sumiko's OCOS cable, and Levinson HF10C speaker wire. Vinyl discs were played on a Lingo-modified Linn LP-12 turntable with an Ittok tonearm and a Spectral Reference moving-coil cartridge, all fine-tuned by Innovative Audio's Casey McKee. CDs were played on a Krell MD-1 CD turntable connected by a standard coaxial interconnect to a Krell SBP-32X D/A converter. Other sources included a Day-Sequerra FM Reference, Meridian 204 FM stereo tuner/timer, Pioneer F-93 Reference FM tuner, and Quad FM4 FM stereo tuner. Line-level preamplification was handled by a Krell KBL preamplifier, phono preamplification by a Mark Levinson ML-7 preamplifier with a Duntech/Audio Standards MX-10 head amp. Analog interconnects included AudioQuest LiveWire Topaz interconnect cables and Krell Cogelco balanced leads.

I listened to my favorite classical and rock CDs and LPs, including Glenn Gould's second recording of Bach's *Goldberg Variations* (Sony IM 37779), and Leopold Stokowski conducting the Chicago Symphony in Shostakovich's Symphony 6 (RCA Red Seal Stereo LP LSC-3133). For kickdrum and guitar, I used Jeff Beck's and Tony Bozzio's "Behind the Veil" (*Jeff Beck's Guitar Shop*, Epic EK 44313), as well as Richard Thompson's "I Misunderstood" (*Rumor and Sigh*, CD, Capitol CDP 7 957132).

BASS MASTER

The Bryston 4B NRB's amazing bass response was solid, deep, fast, powerful, and well-defined. It seemed to have just the right mix of "snap" and "slam," giving the bass a clean, etched leading edge, followed by a massiveness and weight not heard with other amplifiers. The Bryston 4B allowed the Gradient/Quad SW-63s to create coherent, focused bass notes. It also found information and detail in the upper bass; kickdrum was so solid that I could almost touch it. The Bryston 4B is the best amplifier I've heard to date for driving the subwoofers in the Quad/Gradient system. Anyone contemplating the purchase of a Quad ESL-63/SW-63 system must listen to the Bryston 4B driving the SW-63 subwoofers.

I believe that the "snap" and "slam" must be a result of the 4B's ability to deliver large amounts of current, its protection circuit allowing instantaneous current peaks of 40–50A to be drawn. Sometimes this unflappable current reservoir can give one too much of a good thing—the Bryston 4B is capable of bottoming woofers. I did this with both the Snell B and the Quad Gradient subwoofers. Keith Johnson's *Fiesta!* (Dallas Wind Symphony, Reference Recordings RR-38CD) is a case in point. The opening "Prelude and Aztec Dance" of H. Owen Reed's *La Fiesta Mexicana* has a wide dynamic range, opening with a soft chime followed by bass-drum notes of great intensity. The bass drum drove the Snell and Gradient woofers so hard they complained, emitting distinctly mechanical sounds, not music. (This was not repeated!) Chris Russell explained that loudspeakers may have impedance minima below their resonant point, where bass-drum transient components often fall. To produce the transient requires a huge excursion on the woofer's part, and a huge amount of instantaneous

3 Logistic problems made it impossible for this review to be accompanied by a set of measurements. These will follow in due course. —JA

4 The most neutral amplifiers often sound flat, dull, and analytic at first. It is only after months of listening that I find such an amplifier to be relatively freer of coloration. For example, it took over nine months for me to appreciate the Levinson No.27's lack of coloration.

current. If the amplifier's protection circuit and power supply allow it to deliver the requisite instantaneous current, the loudspeaker driver may make such a large excursion that the woofer "bottoms" (as the voice-coil strikes the back of the frame), producing a loud, non-musical noise. Amplifiers with "conservative" protection circuitry will not permit this to happen. The 100Wpc M-L No. 27, for example, never bottomed the Type Bs.

As an upper-range amp, the Bryston 4B proved clean, fast, and very dynamic. Somewhat less transparent than the Levinson No.27 amplifier, it failed to reveal the same silvery sheen on cymbals in Jeff Beck's "Behind the Veil." It played slightly louder on the Quads than the M-L No.27, but never sounded distorted.[5] On Richard Thompson's "I Misunderstood," the Bryston 4B revealed such nuances as Thompson's plosive accent on the last consonant in every line. The Bryston 4B also allowed me to hear the layered textures in the mix on Thompson's CD. The No.27, on the other hand, strives for vividness and shimmer, its slight brightness waking up the somewhat reticent Quads.

Full-range, the Bryston 4B does best on dynamic loudspeaker systems. Both the Sonus Faber Minima minimonitors and the Snell Type Bs blossomed when combined with the Bryston 4B. Snap, focus, width of soundstage, and depth of image were all enhanced by this solid-state amplifier. This effect was maximized if the Bryston was run in bi-wired configuration, using paralleled OCOS cable.

My vinyl jazz records came alive. The soundstage widened, and the separation between instruments more apparent. Dave Grusin's rendition of "Keep Your Eye on the Sparrow" on the direct-to-disc *Discovered Again* LP (Sheffield Labs-5) played with stunning dynamics, speed, and rhythm. The kickdrum region was prominent on the Snell Type Bs, with Ron Carter's string bass and Harvey Mason's kickdrum taking center stage behind Dave Grusin's piano. The amplifier's "snap" sped up the bass response of both dynamic systems. The Bryston added new definition to the bass line in *Misa Criolla*, allowing me to discern the stomping of feet that accompanies the drum in the opening *Kyrie*.

The Bryston 4B also affected the soundstage, giving dynamic loudspeaker systems great depth of image and airiness. This effect did wonders for the "Gnomus" passage on the Dorian *Pictures at an Exhibition* CD (DOR-90117). This passage can sound sodden and bloated, particularly if I've set my subwoofer gain a bit high. The 4B fixed all that, tightening and focusing the deep bass, particularly with the Snell Type B. This produced a more realistic image size and sense of space around the Kleuker-Steinmeyer organ. The bass notes in this quiet passage shuddered the air, vibrating objects in the room with a solidity I'd not heard before. If you love the king of instruments, the Bryston 4B is an amplifier to reckon with.

CONCLUSIONS

The Bryston 4B NRB stereo amplifier is compact, rugged, reliable, high-powered, and comes with a 20-year warranty. All of this, plus its moderate price, make it a great value in the high-end audio marketplace. Its mere 44 lbs mean it can be shipped UPS, making it easy to return to the factory for repairs. Switchable floating-ground and switch-selected balanced or single-ended input options are a great convenience. The 4B has a unique track record in the pro market, where it has been regarded as one of the standard workhorses in concert work and sound reinforcement. But one must recall JGH's point about "rock-solid" audio products—are these wasted on audiophiles, who prefer to change equipment every year?

The Bryston 4B's bass response should generate audiophile interest and loyalty. Take me, for example: I feel that my reference Quad system's subwoofers generate the best bass response with the Bryston 4B; I'd buy the amplifier for that purpose alone. The Bryston 4B's bass response will match any of the amplifiers in the Class A "Recommended Components" list. The 4B's bass "snap" and "slam" make it my first choice as a low-frequency amplifier in a bi-amplified system. More powerful amplifiers, such as the Krell KSA-250, may play more effortlessly, but the Bryston 4B's bass speed and

5 The Bryston 4B seems to play louder because it offers more gain. The 4B provides 30dB of voltage gain, while the Levinson No.27 has 26dB. This requires resetting the bass gain control on the Quad SW-63 subwoofer crossover. Simply inserting another amplifier to drive the Gradient subwoofer without adjusting the level would give the Bryston an unfair advantage. All comparisons between amplifiers were done with this level control adjusted to compensate for the Bryston's higher gain.

power wake up the Quad/Gradient subwoofers as no other amp can.

Does this unusual bass ability make the Bryston 4B NRB a niche amplifier, a Class A Recommended Component just for the bass spectrum? No. While the amplifier is somewhat less impressive driving the Quad ESL-63s full-range, where its speed and snap are more apparent than its transparency, the Bryston has the gutsiness and control that benefit dynamic drivers. This results in increased dynamics, definition, and detail. Bi-wired, the Bryston 4B tightens and deepens the Sonus Faber Minima's bass response. It does a superb job of controlling the overly rich midbass of the Snell Type Bs. This solid-state dual-mono amplifier should be on everyone's must-hear list of amplifiers, therefore, particularly if one has dynamic loudspeakers. **S**

INEXPENSIVE LOUDSPEAKERS & THE PANEL EXPERIENCE: THE ADVENTURE CONTINUES.

Thomas J. Norton, with measurements by John Atkinson, descriptions by Robert Harley

And still they come. Boxes and boxes, stretching for miles and miles. Or so it seems. There are far more loudspeakers out there, especially of the less expensive variety, than we can ever hope to review individually. We therefore gathered several reviewers together in late January for two days of intensive single-blind group listening—much as we'd done last April for our first fully-fledged listening-panel exercise, reported in the July 1991 issue (Vol.14 No.7).

John Atkinson, Corey Greenberg, Guy Lemcoe, and yours truly participated in both days' sessions. On the first day we were joined by Music Editor Richard Lehnert[1] and Steve McCormack of The Mod Squad.[3] On the second day, the last two positions were filled by Robert Harley and Dick Olsher, neither of whom could make the first day's event. So we had a total of six listeners at each session, up from the five and four (first and second days) of our first loudspeaker panel review.

The loudspeakers on hand this time were, again, all small two-ways, often referred to as "bookshelf" loudspeakers but seldom at their best unless mounted on a suitable stand. Discounting the cost of the latter, the loudspeakers ranged in price from $399/pair to $800/pair, a narrower spread than last time. Once again, Snell Type K/IIs—a representative entry-level loudspeaker—were used as a control. On each day the Snells were auditioned twice, first with their identity revealed to the panel, then again in the blind, randomly sequenced among the new contenders, to act as a control.

SETUP & PROCEDURE

The general test setup and procedure were the same as last time. The summary introduction presented here is not as complete as that presented in the writeup of that session (refer to Vol.14 No.7 if you desire more detailed information).

The sessions again took place in the *Stereophile* listening room. This room has changed in only one respect since last July: the wall behind the listeners is now covered with RPG Diffusors in place of the absorptive foam previously in place there. The acoustics are therefore slightly more alive than before.

The loudspeakers were all sited on stands, which placed their optimum vertical listening axes as close as possible to the listeners' seated ear heights.[4] Various combinations of Celestion 24" Si stands, Monitor Audio 21" stands, Hales Audio stands, Tiptoes, Tone Cones, and Merrill Audio Elephant Feet were used

1 Who realized anew why he is a music lover first and an audiophile not at all.[2]

2 Amen. —RL

3 Steve had visited the day before, and agreed to stay on and participate to provide additional perspective on each loudspeaker. Since his firm does not manufacture or distribute loudspeakers, and the auditioning was blind in any case, his participation resulted in no conflict of interest.

to achieve this. With six listeners per session, some compromise was involved. The listeners were seated in three rows: one listener in row one, two in row two, and three in row three. Loudspeaker positions were chosen with the help of the Snell CARA-LEO room analysis program, which placed them well away from nearby walls. All loudspeakers were "toed-in" to focus their on-axis responses at the center of the middle row of listeners.

A screen of black grillecloth hid the identities of the loudspeakers from all listeners except yours truly (TJN), who handled all of the setups. Each loudspeaker's own grille, if provided, was removed to eliminate any degradation from the use of a double thickness of grillecloth.

MUSIC

We again restricted our selections to CD-based material. Some of the selections were carried over from last time, some were new. Both to ensure that there would be time to get through all of the loudspeakers on each day and to keep the auditioning of each to a short enough time that listener fatigue would not be too bothersome a factor, we scaled back the number of musical selections from ten to eight. Each loudspeaker presentation lasted about 25 minutes, therefore, with a 20-minute break before the next. The program material was excerpted from the following:

Non-musical selections: Pink Noise (played in mono, left loudspeaker only), and J. Gordon Holt, "Why Hi-Fi Experts Disagree," both selections from the *Stereophile* Test CD (STPH002-2), bands 4 and 5 (index 19), respectively.

Musical selections: 1) Henry Eccles: *Allegro con spirito* from Sonata for Double Bass and Harp; Gieselle Herbert, harp; Günter Kraus, double bass; from *Staccato 2: The Second Audiophile CD-Sampler*, *Audio* Magazine (Germany). The bowed double-bass does not make serious dynamic demands on a loudspeaker, but by its nature is a good test for low-frequency resonances.

2) Kenny Rankin: "This Old Man," *Because of You*, Chesky JD63. Superbly recorded male vocal and piano, with a close-up (but not *too* close-up) perspective.

3) Mike Garson: "Without Self," *The Oxnard Sessions, Vol.1*, Reference Recordings RR-37CD. Jazz group in a natural space with a solid low end and deep, three-dimensional soundstage.

4) Solo drum set. Recorded live to DAT by Robert Harley at the Manley studios in California. Dynamic, punchy, and lively sound with explosive dynamics. This selection is on the second *Stereophile* Test CD (described elsewhere in this issue), but here the source was the original DAT.

5) Amanda McBroom: "Amanda," *Growing Up in Hollywood Town*, Sheffield Lab CD-13. A classic, if by now rather overdone, audiophile favorite. Very natural recording.

6) Arnold: Saraband and Polka from *Solitaire*; Malcolm Arnold, London Philharmonic; Lyrita SRCD 201. Wide dynamic range, clean sound, and solid bass-drum impacts.

7) Field: *Nocturne No.1 in E-flat*; Miceál O'Rourke, piano; Chandos CHAN 8719/20 (2 CDs) (excerpted from Chandos CHAN BM2 sampler CD).

8) Prokofiev: "Arise, People of Russia," *Alexander Nevsky Cantata*, Op.78; André Previn, Los Angeles Philharmonic; Telarc CD-80143. Wide dynamics and complex scoring. Praised by JGH in a 1988 review, this is still one of Telarc's better-sounding CDs. The excerpt used here was different from that used in the 1991 panel test.

Last time around, I found my chores as disc-jockey wearing, as well as distracting to the group. I was popping up and down constantly to change CDs as we moved from one selection to the next. This time around, the selections were all dubbed digitally onto DAT. It was only necessary for me to cue up the tape and change levels as required. A brief silence was left on the tape between selections to enable each member of the panel to complete his comments and scoring.

SETTING LEVELS

In a preliminary setup session, I auditioned the completed DAT through the Snell Type K/IIs. I chose what I felt to be an appropriate playback level for each piece of music, and noted that as a reference level. The corre-

4 As before, JA determined this by measuring the loudspeakers before the sessions. Any possible influence this might have had on him during the sessions was minimized by his listening to the loudspeakers in the blind. TJN, the only listener who knew the identities of the loudspeakers behind the screen, was only told the appropriate height to use by JA, and did not see the measurements.

Manufacturer:	Tannoy	Nelson-Reed	a/d/s/	Mirage
Model:	609	5-82/CM	SAT 6	M490
Type:	Stand-mounted	Stand-mounted minimonitor	Stand-mounted	Stand-mounted
Tweeter:	1" Al dome (Dual-Concentric)	1" Al dome	1" soft-dome	1" Ti dome
Woofer:	8" polyolefin co-polymer	5.25" carbon-loaded polymer	6" polymer-cone	8" polypropylene-cone
Bass loading:	Reflex	Sealed-box	Sealed-box	Reflex
Approx. LF extension:		40Hz (-10dB)		38Hz
Crossover frequency:	2.5kHz	3.2kHz	2kHz	2kHz
Frequency range:				
Frequency response:	46Hz-30kHz (+/-3dB)	70Hz-20kHz (+/-3dB)	50Hz-20kHz (+/-3dB)	40Hz-22kHz (+/-3dB)
Sensitivity:	89dB/W/m	90dB/W/M	87dB/W/m	86dB/W/m
Nominal impedance:	8 ohms	8 ohms	4 ohms	6 ohms
Minimum impedance	5 ohms	6 ohms		4 ohms
Amplifier requirements:	10-120W	20W min	20-150W	50-150W
Height:	19.5"	12"	13.2"	19.25"
Width:	12.6"	8"	7.3"	9.7"
Depth:	8.9"	8"	8.3" (without grille)	10.75"
Enclosure volume:	16 liters	0.25 cu.ft.		
Weight:	22 lbs	12 lbs	22 lbs	28 lbs
Price per pair:	$599 (stands $149/pr)	$650	$800	$600 (stands $129/pr)
Approximate number of dealers:	51	20	100	135
Warranty:				
Serial numbers tested:	217743/4	1501L/R	2164/6	00361/2
US Distributors:	Tannoy 141 Linden Street, Suite G3 Wellesley, MA 02181	Nelson-Reed 15810 Blossom Hill Road Los Gatos, CA 95032	Analog and Digital Systems, Inc. One Progress Way Wilmington, MA 01887	Audio Products International Corp. 3641 McNicoll Ave. Scarborough, Ontario M1X 1G5, Canada
Tel:	(617) 239-1692	(408) 264-2673	(617) 729-1140	(416) 321-1800
Fax:	(617) 239-0096	(408) 356-3633	(508) 658-8496	(416) 321-1500

Table 1. (Loudspeakers)

sponding levels for each of the other loudspeakers was then determined by relating the measured sensitivities of each loudspeaker—in an octave band centered at 1kHz—to that of the Snell. It was then a simple matter to calculate the setting required on the Rowland Consummate preamplifier for each selection over each loudspeaker. The Rowland, for those unfamiliar with it (and who missed my review in Vol.15 No.1), has a level control with 200 repeatable steps—with approximately 0.2dB change from one to the next. It also has a front-panel readout for each of these steps. It is therefore possible to not only determine the required setting accurately, but to repeat it precisely and almost instantly via remote control, at a later late.

PAY NO ATTENTION TO THE LOUDSPEAKER BEHIND THE CURTAIN

On the first day the seating was as follows: JA, front and center; second row, CG left, facing the loudspeakers, and RL right; third row, TJN left, GL center, and SM right. On the second day DO sat in RL's former seat, RH in SM's; the rest of the seating remained the same.

As before, the Snell Type K/II was played first and identified on both days. Following this open audition, it was mixed in with the other loudspeakers and auditioned blind for all of the listeners except TJN, who performed the setup and adjusted the playback levels as required. The Snells' tweeter-level controls were set at 9:00 (the Snell was the only loudspeaker with such an adjustment). The randomly selected order of loudspeakers was different on each day, as one's perception of a speaker's overall quality will be affected by that of the speakers preceding it. Listeners were cautioned to avoid any verbal or nonverbal communication while the audition was in progress to avoid influencing others' scores and written comments. Since I was listening non-blind, and was also responsible for collecting and tabulating the scoresheets, I refrained from looking at the first day's results to avoid being influenced directly or indirectly by others' opinions prior to the second day's sessions. Except for the pink-noise and JGH tracks, all listening was done in stereo.

INDIVIDUAL AUDITIONS

After the sessions were completed on Day Two, each panel member (except RL and SM) randomly drew lots to select one or two of the loudspeakers to take home and audition under more familiar conditions. As before, none of the panel members listening in the blind were given any results from the panel tests until their individual auditions were completed. And although I was to tabulate the data and write up the final results, I did neither until my own individual auditioning was completed.

Under more familiar, open conditions,

Manufacturer:	Pinnacle	KEF	Spica	N/A
Model:	PN8+	Q60	SC-30	Black Dahlia Mk.II
Type:	Stand-mounted	Stand-mounted	Stand-mounted	Stand-mounted
Tweeter:	1" polymer-dome	1" polymer-dome (Uni-Q)	1.5" polypropylene-cone	1" Ti dome
Woofer:	8" polypropylene	8" polypropylene-cone	8" pulp-cone	6.5" polypropylene
Bass loading:	Reflex	Reflex	Sealed-box	Reflex
Approx. LF extension:		45Hz (-6dB)		
Crossover frequency:	2.2kHz	2.5kHz	3kHz	3kHz
Frequency range:	30Hz-21kHz			
Frequency response:		60Hz-20kHz (+/-3dB)	54Hz-27kHz (+/-3dB)	65Hz-16.5kHz (+/-3dB)
Sensitivity:	92dB/W/m	90dB/W/m	88dB/W/m	82dB/W/m
Nominal impedance:	6 ohms	8 ohms	8 ohms	8 ohms
Minimum impedance		4 ohms		
Amplifier requirements:	10-250W	10-100 W	25-100W	
Height:	19.5"	18.9"	23"	18.75"
Width:	11.5"	9.72"	10"	12"
Depth:	11.4"	10.8"	11.75"	14.75"
Enclosure volume:		19.8 liters		
Weight:	35 lbs (shipping)	15.8 lbs	28 lbs	35 lbs (est.)
Price per pair:	$460	$599	$399	$643 (see Note)
Approximate number of dealers:	200	300	120	see Note
Warranty:	7 year transferrable			
Serial numbers tested:	none provided	007853/4	0792/3, 1619, 1620	N/A
US Distributors:	Pinnacle	KEF America	Spica	see Note
	255 Executive Drive	1701 Touchstone Road	3425 Bryn Mawr N.E.	
	Plainview, NY 11803	Colonial Heights, VA 23834	Albuquerque, NM 87107	
Tel:	(516) 576-9052	(804) 520-7200	(505) 883-6120	see Note
Fax:	(516) 576-0826	(804) 520-7260	(505) 883-6512	see Note

Note: This is the assembled price from Just Speakers, 3170 23rd Street, San Francisco, CA 94110, Tel: (415) 641-9228. They sell kits also. Complete kits including cabinets are $595/pair, without cabinet $381/pair. The cabinets alone are $239/pair. Note that the Just Speakers cabinets are double-wall (total thickness 1.5"), but do not have the laminated center foam core of the tested prototypes. There are other suppliers of Dahlia kits, including Madisound, Box 4283, Madison, WI 53771, Tel: (608) 831-3433; at the time of writing, however, the latter did not have cabinets for the Mk.II.

opinions may vary from those in the blind sessions. As I write these words, I have seen none of the individual reviews except my own, but I would be very surprised if there were not some interesting differences. Different rooms, different associated equipment, a more relaxed environment, and familiar program material can all make a difference.[5]

TESTING

The eight pairs of loudspeakers were subjected to *Stereophile*'s standard set of measurements by JA. He used the Audio Precision System One to measure each speaker's impedance amplitude and phase, to get an idea of how difficult each speaker would be to drive, and the DRA Labs MLSSA system with a calibrated B&K 4006 microphone (see Vol.14 No.10, p.205) to assess the anechoic response on the listening axis at a distance of 44", averaged across a 30° horizontal window above 200Hz and the nearfield bass response below that frequency.

JA also used the MLSSA system to look both at the sensitivity and at the manner in which each speaker's response changed as the listener moved off-axis in both vertical and horizontal planes. As explained in footnote 4, this was done before the listening tests so that TJN could place each pair of speakers on optimally high stands. Though JA therefore had a rough idea of how each speaker measured, these tests were performed almost two months before the panel auditioning, and his memory isn't what it was. In any case, he didn't refer to the measurements again until writing them up after all the listening—panel and individual—had been concluded.

Because the MLSSA system allows you to transform just the anechoic response of the impulse response to the frequency domain, it is important to push room reflections of a speaker's direct sound as far back in time as possible when taking a measurement. JA therefore covered the floor in front of each speaker with a sandwich of fiberglass, coarse Distech foam, and finer-grain Sonex foam, in effect creating an acoustic "black hole" on

5 There is also the factor that, in a blind test, you can never go back to check any particular aspect of performance. Under normal sighted conditions, let's say you notice what might be a narrow-band coloration on female voice. You can play the same track again or reach for different recordings to explore, confirm, or deny the observation. The overall conditions and ever-changing musical selection in the blind test (necessary to make it practical) work against the process of diagnosis, leaving the listener's perception to some extent lagging events. While blind panel testing has its place, it is too blunt a tool to become the be-all and end-all of review procedure, in my humble opinion.

Before all you blind-test buffs rush for your pens and papers to write angry letters to the editor accusing me of striking a political stance—see this month's "Letters" column—note that I know that of which I speak. As well as carrying out dozens of normal reviews in the last 10 years for *Hi-Fi News & Record Review* and *Stereophile*, I have both taken part in and organized many tens of blind tests since the Spring of 1977, when I was part of a panel for a blind test on loudspeakers organized by the late Jimmy Moir. —JA

	Spica SC-30	Mirage M490	a/d/s/ SAT 6	Tannoy 609	Snell KII	Pinnacle PN8+	Nelson-Reed 5-02/CM	KEF Q60	Black Dahlia Mk.II	Average for each piece of music
Pink Noise	4.96	4.79	4.44	3.92	4.46	5.00	3.88	4.96	4.25	4.52
JGH	5.04	4.54	4.97	3.46	4.38	4.96	3.92	4.83	3.50	4.40
Double Bass	5.28	4.25	4.50	3.67	4.63	4.67	3.67	5.07	4.58	4.48
Male Vocal	5.10	4.15	4.67	3.33	4.92	4.78	3.46	5.23	4.75	4.49
Jazz	5.53	5.03	4.86	3.17	5.40	4.69	3.13	5.13	4.62	4.61
Drumset	5.50	4.63	4.54	2.79	5.78	4.96	2.96	4.57	5.12	4.54
Female Vocal	5.05	4.79	4.48	3.07	5.85	4.80	2.96	4.78	5.00	4.53
Orchestra	5.08	4.93	4.42	3.17	5.33	5.23	2.96	4.72	4.92	4.53
Piano	4.86	5.18	4.19	3.00	5.40	4.98	3.17	4.98	4.08	4.43
Orch./Chorus	4.78	4.58	4.39	2.50	5.13	4.94	2.67	5.28	4.25	4.28
Overall Average 4.48	5.12	4.69	4.54	3.21	5.13	4.90	3.28	4.95	4.51	4.48

Table 2. AVERAGES

the floor so that the first interfering reflection is that from the ceiling, at least 4ms and up to 6ms away in time depending on the height of the speaker on its stand. The frequency response curves are therefore accurate down to around 250Hz, though frequency resolution is limited below 1kHz or so. This is why JA measures the response below 200Hz with the microphone almost touching the bass unit or port. Work done by *Audio*'s Don Keele in the early '70s showed that this was equivalent to measuring the speaker anechoically provided the measuring distance was very much smaller than either the size of the woofer or the wavelength of sound being reproduced. Both anechoic and nearfield responses are shown on the same graph for each speaker, but the level match between them can only be approximate. (It is based, however, on the speaker's overall response measured in-room.)

ASSOCIATED EQUIPMENT

The CDs were dubbed via digital direct from a Wadia WT-3200 CD transport using a Univocal digital cable onto a JVC XD-Z1010TN DAT recorder. Playback consisted of the same JVC deck with a coaxial digital output feeding an Audio Research DAC1-20 D/A converter, Rowland Consummate preamplifier, and Krell KSA-250 amplifier. The digital interconnect was a Univocal cable on Day One, changed to a Kimber KCAG on Day Two. The converter-to-preamp link was via AudioQuest Lapis, the pre-to-power-amp connection used (balanced) Cardas Hexlink (an early version). The speaker cable was AudioQuest Dragon, mono-wired.

TABULATION OF PANEL RESULTS

For each loudspeaker, each listener was given a separate scoresheet with space for a numerical score and comments for each musical and non-musical selection. The scores were to be from 0 to 10, with an average hypothetical score for a typical good-value loudspeaker in this price range being 5. Following the sessions, average scores were calculated for each loudspeaker using a spreadsheet program. The average scores given to each loudspeaker for each piece of music were also calculated, and are shown in Table 2.

I've diverged slightly from the last loudspeaker survey in the way I've organized the written subjective comments made during the listening sessions. Rather than intermix all of the listeners' comments for each loudspeaker, as I did last time, I've isolated each listener's remarks and presented those which seem to best summarize that individual's reaction to that particular loudspeaker. Since all of the loudspeakers would have the opportunity to make their cases to an individual reviewer during the more leisurely, individual auditions, the listeners were instructed during the panel sessions to offer written comments only after determining a numerical score. Therefore some panel members were more sparing than others in their comments on specific loudspeakers. Even so, there was no shortage of written remarks. And while there was no shortage of negative reaction to *any* of the loudspeakers, remember that we were holding them up to a high standard. A number of them *will* nevertheless find their way into our next "Recommended Components" list.

As an aside, we had mechanical problems

with three of the loudspeakers' rear (five-way) input jacks. On the Pinnacles, the plastic nut used to cinch down spade terminals stripped on three of the terminals, making it difficult to tighten them securely. It was still possible, of course, to use the banana sockets on the posts. On the Mirages and KEFs, not only did we experience a similar problem, but a terminal actually broke off at its pillar, necessitating replacement surgery. Fortunately this happened *before* the listening sessions. This isn't the first time I've experienced input-terminal problems; that on the KEFs, for example, seemed to be due to the hole for the cable being large enough to significantly reduce the mechanical integrity of the pillar. I urge all loudspeaker manufacturers to take a long, hard look at this seemingly routine part of their designs.

The overall numerical panel score for each loudspeaker is shown immediately below the listening-test heading for that loudspeaker. The overall score is given first, then in parenthesis the average scores for days one and two, respectively (the Dahlia was auditioned only on the second day). The overall average score for all loudspeakers and all listeners, on all days, was 4.48.

SNELL TYPE K/II: $465/PAIR
5.13 (6.39 / 3.86)

The Snell Type K/II, our control, scored higher than any of the other candidates this time around. (The scores given above are for its *blind* listening sessions only). But it did so with some inconsistency. Prior to the test, as previously stated, I'd chosen what I felt to be an appropriate playback level for each musical selection by listening to it over the Snells. The levels for the other loudspeakers were adjusted up or down from that, as has already been described, to account for the specific loudspeaker's difference in sensitivity from the Snell in the 1kHz octave band. I felt after the first day's sessions that this ultimately made many of the loudspeakers sound rather pallid next to the Snell—a judgment verified by the scores. The Type K/II outscored its nearest competitor by more than a full point on Day One. Therefore, the overall playback level was raised—for all of the loudspeakers—by 2dB on the second day. This included the Snell; we were trying to liven-up the overall sound, *not* monkey around with the measurement-determined relative levels of each loudspeaker. This may well have made the Snells shift from "dynamic and punchy" to "aggressive"—an easy threshold to cross with inexpensive loudspeakers—resulting in its precipitous drop in the second day's ratings. Nevertheless, it clearly remains a solid performer in its price range.

TANNOY 609: $599/PAIR

Description: The Tannoy 609 is the middle product of this British company's new seven-speaker "Sixes" line. A distinguishing characteristic of this series is the unusual six-sided cabinet, which reduces the parallel surface area inside the cabinet, thus minimizing standing waves. By using six smaller panels of varying dimensions (rather than four larger panels of nearly equal dimensions), their resonance modes are higher in frequency and more evenly distributed over the audio spectrum. The unequal-sided hexagon is capped with a base and top, a vertical internal brace running between them to

Tannoy 609 loudspeaker

increase rigidity and reduce cabinet resonance. The bases are injection-molded from mineral-filled polyolefin, a material that reportedly has good damping properties. Two rear-firing ports identify the 609 as a reflex design. The enclosure's exterior has rounded edges to reduce diffraction. This is a lot of attention to cabinet construction for a $600/pair loudspeaker.

The 8" driver is a "Dual Concentric" design that puts a 1" aluminum-dome tweeter inside the bass unit, at the rear of its voice-coil. This technique reportedly results in a radiation pattern that more closely emulates a point source. The 8" cone is made of a sheet of polyolefin copolymer, injection-molded to the cone shape. The cone's thickness (and thus its stiffness) varies over the piston area, with maximum thickness near the neck where the cone is driven by the voice-coil.

The crossover filters are first-order (6dB/octave) with a frequency of 2.5kHz. Polypropylene capacitors and iron-dust core inductors are used throughout, and the network is hardwired. Two pairs of gold-plated binding posts are provided for bi-wiring—the supplied links for conventional wiring are joined at the top by a plate with the "Tannoy" logo on it—though these are too wide for dual-bananas and there is very little room to get two pairs of cables hooked up. Threaded inserts allow for carpet-piercing spikes or bolting to Tannoy's matching stands. The 609s are finished in either black ash or walnut, with an unusual two-tone brown and blue, *faux* marble top-plate.

Listening Tests Panel Score: 3.21 (3.06 / 3.36). On the first day JA was rather lukewarm toward the Tannoys, finding them generally "inoffensive in the treble" and with a "low bass that doesn't boom." But he found the midrange too colored and the overall sound lacking in clarity. Day Two improved matters considerably in his judgment, when he rated the Tannoys above average. He still found the top end reticent, the lower mids colored, and the dynamic range in the low treble restricted—he found on the *Nevsky*, for instance, that the 609s worked better on massed voices at lower levels than at higher levels. But he liked the soundstage image and depth, the sense of space, and the overall "palpability" in the midrange. For the two days combined, however, he rated them slightly below his own average score for all of the loudspeakers.

CG, on the other hand, rated the Tannoys near the bottom on both days. He found the mids very colored and distant. "Hollow vocal, wolf-tone in the upper range of Kenny [Rankin]'s voice. Really colored midband," he noted. He felt that they lacked air on top, with an amorphous bass. "Dull, clumsy, no air on cymbals," he commented on the Tannoys' performance on the drum set. He also found them to harden up on peaks, particularly on the orchestral recordings.

Both DO and RL had similar—and negative—reactions to the Tannoys. RL's reactions are perhaps best summarized in his reaction to the *Oxnard Sessions*: "Music seems canned, remote, under glass—I can't get at it. Makes any kind of visceral response impossible. Music is felt viscerally or not at all."[6] Though the levels were, again, set slightly higher on the second day when DO took RL's place, his reaction was not all that different. He found the Tannoys bland and lacking in clarity and impact.

GL was also disappointed in the 609s. He was troubled by their midrange coloration, commenting on their poor vocal reproduction. He also remarked negatively both days on the coloration of the horns on the jazz cut. He agreed with DO and RL that the speakers lacked impact, top-end extension, and a sense of involvement.

RH and SM, on their separate days, did not like the Tannoys much either. SM thought the response missing at the extremes and was not overly taken with the mids. "Am I being too critical?" he asked in a written comment, "I don't like this sound." RH also thought the top rolled-off, the mids way too laid-back, and dynamics lacking. He, too, thought the Tannoys "uninvolving, bland."

Nor, I'm afraid, could Tonto and I do much to save the day here. I found the Tannoys lacking in impact, clarity, and openness. On the second day, particularly, I noted midrange coloration on almost every selection, ranging from boxy drums to a very colored, hooty sound on chorus.

It's possible that a different placement in a different room would at least mitigate the rather consistently noted problems the panel found with the 609s. But under our

6 RL apologizes to Virgil Thomson.

listening conditions, they were a definite disappointment.

CG comments on the Tannoy 609: "Pick a speaker, any speaker," said TJN as he fanned the handful of paper slips in front of my face. On each slip of paper was the name of one of the ten (? how many *were* there?!) speakers we'd *finally* PRAISE ALLAH finished blind-listening to just minutes before, and Tom was now farming the speakers out to each of us for the in-home phase of the final review. TJN appeared sincere, but I knew better.

When I was wee, I was what we in The Sacred Brotherhood call a *prestidigitator*; I performed magic tricks at children's birthday parties and other legitimate social functions. I had an old collapsible top hat that had once belonged to my Grandpa Herb and a black velvet cape from Louis Tannen's shop in NY, and I knew every trick in the book. I mastered the famous linking rings, the floating ball under the scarf, the horrifying finger guillotine. No set of handcuffs or leg-irons could hold me; no ten-year-old girl could resist me as I plucked farm-fresh egg after farm-fresh egg from my very mouth. I was a shaman's shaman, a friend of the devil, a necromancer. *I was a bad ten-year-old mofo.*

One of the books I read during my study of *les artes noires* was Marshall Brodein's *1,001 Card Tricks So EZ Even A Ten-Year-Old Mofo Can Pull 'Em Off!*, so when TJN thrust the overturned slips of paper at me and bade me choose one, I knew he was "forcing" me to pick a predetermined slip. What seemed to the rest of the group an innocent gesture was obvious to my trained magician's eyes as a con, a trick, a *scam*.

"Ho-*ho*, Tommy ol' boy!" I thought, "What kind of a cheese-eating *layman* do you take me for? I didn't forfeit a normal childhood for practicing The Mysterious Disappearing Cans Of Rice just so I could be the town geek!" I knew what *every* extraverted social outcast with a rabbit and a dream knows: that magic is simply a *discipline*, a regimen designed to hip oneself to the ever-present deceit and treachery waiting at Life's Every Turn. And I'd be good'n'DAMNED if I was gonna let *Stereophile*'s Technical Editor make a first-class monkey out of *me*.

However, after seven continuous hours of blind listening to some of the worst music and sound I'd ever heard in my entire life, I walked tiredly and resignedly into the hellfire of TJN's chicanery and plucked the slip sticking out farthest from the rest. What else could I *do*? The play was already written; all I had to do was read my lines.

I turned the slip over. "Tannoy" was all it said.

These are *wretched* loudspeakers. Bi-wired via two 8' pairs of Straight Wire Maestro to a Muse Model 100 amplifier and driven with familiar source material, the Tannoys produced the most amusical sound I have ever had in my listening room. Bar none. The highs were bright and harsh. The midrange was nasal and confused, with obvious "cupped-hands" coloration. Vocals sounded like the singers were using megaphones instead of mikes. The bass, what there was of it, was flabby, tuneless, and slow. Dynamics were poor, as the 609s not only got *super*-hard when pushed even moderately loud, but the ported woofer bottomed out with a sickening crack at what I consider laughably wimpy levels.

Normally, I'd go into greater depth with each of these findings, illustrating each facet of the DUT's performance with a piece of music I used in the evaluation process, but the Tannoys so offended me that I found myself getting up to turn the system down halfway into every song I played. If you *must* know for your own private and assuredly suspect reasons, I listened to Lyle Lovett's track on the *Deadicated* CD, Jack McDuff's and Gene Ammons's *Brother Jack Meets The Boss* (Prestige LP P-7228), Elvis Costello's *My Aim Is True*, and Nirvana's *Nevermind*.

I'll be honest with you, I didn't even try to evaluate the Tannoys' imaging and soundstaging abilities; if a speaker sounds this wrong tonally, I don't give a rat's *ass* if it makes Patsy Cline stand right there in the room in glorious, unmistakable 3-D, her tears of faded love falling silently into the deep beige shag of the listening-room carpet. BEGONE, FOUL TRANSDUCERS!! The 609s are, by quite a wide margin, the worst speakers I have ever had in my home.

Think I've been too harsh? Find a dealer who stocks 'em and go listen for yourself. I'll be waiting by the mailbox, but I won't be holding my breath.

JA comments on the Tannoy 609: When Corey told me of the depth of his ire and I

experienced the wretched excess of his vocabulary, I took a listen to the 609s with the same components I'd used to audition the KEFs and Nelson-Reeds. (This was before I'd seen the panel results.) Well, my listening notes pretty much said the same things as he, and eventually they, did: noticeable cupped-hands coloration in the rather forward midrange, coupled with a lack of top-octave air that made the overall balance too warm. In my room and system, the bass actually seemed to have some dynamics, without *too* much boom, and the imaging was superbly precise, with a wealth of ambient detail apparent. Nevertheless, I kept returning to the overly colored midrange, which I found particularly annoying on orchestral strings and piano. Interestingly, a recent review in the English magazine *Hi-Fi Choice* (January '92, p.125) rated the 609s as a "Best Buy" at their UK price of £250/pair. But note this passage from the *Choice* panel's description of the speaker's sound: "It goes loud with some decorum and punch, though the bass is a little short on pace and authority. . . the relative lack of treble was noted, as was a consistent 'quacky' coloration on voice. . ."

We've obviously all been listening to the same speaker. Has *Stereophile* been too critical? No, I don't think so. My feeling is that the pace of improvement in the design of inexpensive low-coloration loudspeakers in the last four years or so has been astonishing. Any significant degree of midrange character, no matter how good the imaging or how effortless the dynamics, makes a loudspeaker with hi-fi pretensions uncompetitive in today's market. A disappointment, therefore, from one of the great names in British loudspeakers.

One final point: the panel and sighted auditionings were done with the speakers' grilles off. The veneered front baffle with the Tannoy logo on it in gold and the smartly finished dual-concentric drive-unit seem to suggest that Tannoy feels the speakers should be used this way. I found, however, that the grille—the frame of which touches the sides of the driver's mounting plate—somewhat reduces the speaker's midrange coloration. As Corey suggests, therefore, listen to the 609s for yourself.

Measurements: The 609's reflex bass alignment is revealed by the twin peaks in the impedance plot (fig.1), with the twin ports tuned to 33.5Hz (the saddle between the peaks). Only dropping below 8 ohms between 100Hz and 550Hz, it will be a very easy load for even inexpensive amplifiers to drive. (The lowest amplitude is 5.2 ohms at 183Hz.) Though it's impossible to see on the scale this graph is reproduced in here, there are a few small wrinkles in the curves, indicating panel or enclosure resonances at those frequencies.

Fig.2 shows the 609's impulse response on the tweeter axis. Note the slow rise of the woofer before the tweeter comes in, indicating a degree of time alignment to the system, while the high-frequency ringing is due to the tweeter and should be above audibility. To the right of fig.3 is shown the Tannoy's

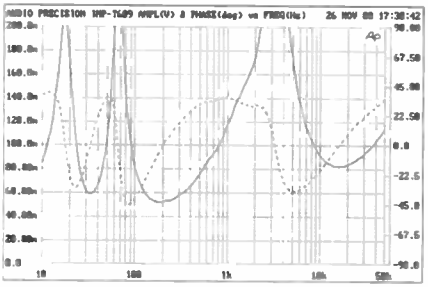


Fig.1 Tannoy 609, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.)

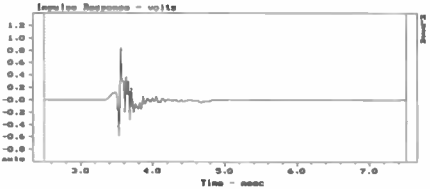


Fig.2 Tannoy 609, impulse response on tweeter axis at 44" (5ms time window, 30kHz bandwidth)

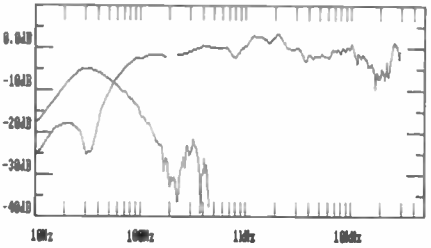


Fig.3 Tannoy 609, anechoic response on tweeter axis at 44" averaged across 30° horizontal window and corrected for microphone response, with nearfield woofer and port responses plotted below 200Hz.

response on the tweeter axis averaged across a 30° horizontal window. Note the excess of energy in the upper midrange and the early rolloff above 10kHz. Here are the forward midrange and dull top octave noted in the auditioning. The response curve shape—the depressed highs emphasizing the forward upper mids—probably also correlates with the midrange coloration noted, though other factors will be at work here as well. Despite the low tuning of the ports, the left curves in fig.3 indicate the 609's bass to be rather shelved down. Note, however, the peak in the port output centered on 300Hz, which may well be indicative of a cabinet resonance at that frequency. The panel generally did note a lack of clarity in the speaker's presentation.

Looking at how the speaker's balance changes as the listener moves off-axis horizontally (fig.4) and vertically (fig.5) reveals excellent dispersion, with more energy apparent above 10kHz. This will contribute to the speakers' excellent soundstaging. Finally, fig.6 shows how the Tannoy's balance changes as sounds decay. Resonances show up in this kind of cumulative spectral-decay or "waterfall" plot as ridges parallel to the time axis. Note both the generally hashy decay of the 609's sound, with a strong resonant mode noticeable just above 11kHz, and the "step" in the response at 3kHz (the 609's crossover frequency is 2.5kHz). The former will lend the treble a grainy quality; the latter will contribute to the coloration noted.

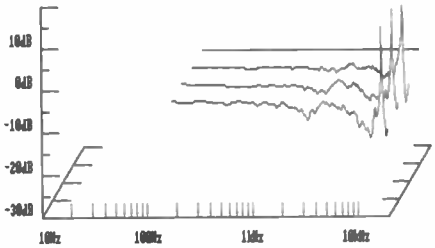


Fig.4 Tannoy 609, horizontal response family at 44", normalized to response on tweeter axis, from back to front: reference response; difference 7.5° off-axis; difference 15° off-axis; difference 30° off-axis.

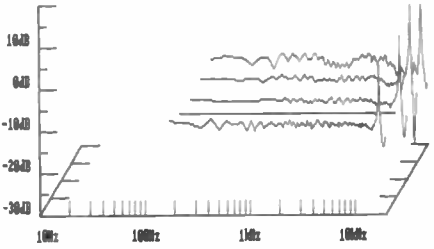


Fig.5 Tannoy 609, vertical response family at 44", normalized to response on tweeter axis, from back to front: response difference 7.5° above cabinet top; difference level with cabinet top; difference level with top of woofer; reference response; difference level with base of woofer.

NELSON-REED 5-02/CM: $650/PAIR

Description: The Nelson-Reed 5-02/CM, the smallest loudspeaker in the Nelson-Reed line, uses a 5"-frame polymer-cone woofer and a 1" ferrofluid-cooled metal-dome tweeter in a sealed enclosure. The tweeter is assembled from Vifa parts by Nelson-Reed, using a proprietary technique that damps the

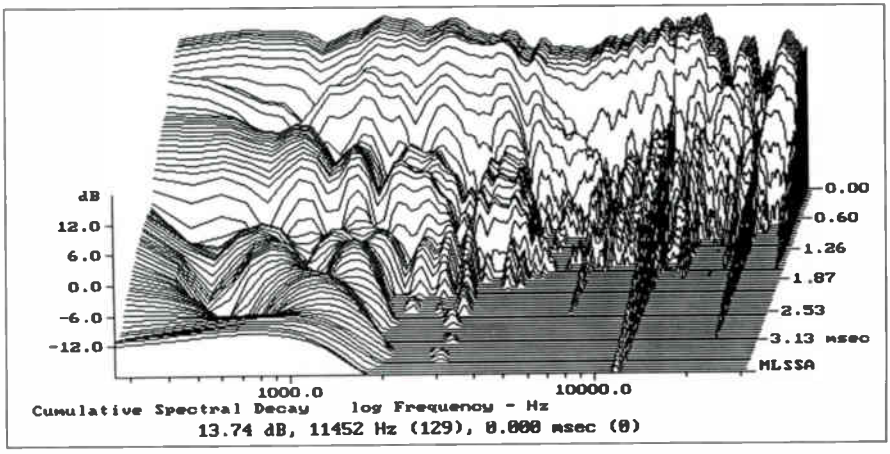


Fig.6 Tannoy 609, cumulative spectral-decay plot

Nelson-Reed 5-02/CM loudspeaker

tweeter's ultrasonic ringing, reportedly by 30dB. This assembly technique is said to attenuate audio-band intermodulation products. Nelson-Reed uses the same tweeter throughout their line, including the 8-04/CM favorably reviewed by JGH in March.

The 5-02/CM is distinguished by its oiled, hand-rubbed wood veneer finish (over ¾" MDF) with solid hardwood corners. A 5-element network with a crossover frequency of 3.2kHz forms the network. Although the crossover is first-order, the tweeter circuit offers a dual slope to achieve greater attenuation in the stopband. Air-cored inductors and polypropylene caps are used throughout. A single pair of five-way binding posts is provided on the rear panel.

Listening Tests Panel Score: 3.28 (2.88 / 3.67): The Nelson-Reeds, with the smallest cabinet and woofer in the group, may have been undone by the lack of LF reinforcement from the relatively free-space positioning chosen. Certainly the Nelson-Reeds' lack of low-end weight bothered most of the panel and definitely brought their score down, despite some favorable characteristics.

JA had positive remarks about the Nelson-Reed's midrange clarity; though he heard some mild colorations, he didn't dwell on them. He also liked the "good sense of space," though he didn't find the depth that impressive. But he found the sound undone by a lack of body. "Uninvolving, overall," he noted; "lightweight"; "quiet dynamics and threadbare sound." He did note that the speaker might be used to better effect near a wall, where the reinforced LF would allow its midrange clarity to "shine on through."

CG thought the sound lacked air and dynamics. He was also almost totally put off by the lack of a bottom end. On pink noise he thought that the Nelson-Reeds sounded like "steam escaping!" "Where's DA BASS?" he wanted to know. "I'll bet Bob is cringing right now," he noted on RH's drum set recording, "this track is the speakers' worst nightmare."

RH *was* cringing. On the drum set he wrote, "Bass drum sounds like a pencil on an oatmeal carton, cymbals whitish." He thought the Nelson-Reeds, overall, to be cold, thin, and—at higher levels—hard.

DO made very sparing comments, but he apparently focused on the Nelson-Reed's better attributes and was able to disregard the lean balance. "Very good pitch definition," he wrote; "clean, focused midrange," and "natural, detailed treble." He rated them quite highly. RL, on the other hand, stayed with the majority. "So distant," he wrote, "mini-drums, speakers de-emphasize tom-tom pitches, losing the 'tune'." He couldn't get at the music with the Nelson-Reeds. SM agreed. "OK, so it's not actively aggressive," he noted, "but so what. Talk about no guts!" He added, "This is the speaker version of lite beer—less filling."

To itemize GL and yours truly's remarks would belabor the obvious here. Suffice it to say that we differed little from the majority. Both of us thought the top end reasonable, but seriously criticized the lightweight balance. A potential buyer for the Nelson-Reeds had best be prepared to use a subwoofer in any reasonably sized room.

JA comments on the Nelson-Reed 5-02/CM: According to Nelson-Reed's excellent manual, the axis on which the 5-02's drive-units are intended to blend correctly is actually below the woofer, meaning that very high stands should be used. As the highest stands to which I had access were the 24" Celestions, I placed the Nelson-Reeds upside-down on them, which placed the

tweeter nearest the floor and my ears level with what was now the top of the cabinet. The speakers' heavy cloth-on-frame grilles were removed for all my listening. I used two amplifiers with the speakers: the promising $995 Acurus DA1 and the pair of Mark Levinson No.20.6 monoblocks that I wrote about in the April issue. Front end was both a fully-loaded Linn LP player and a VTL Reference DAC driven by the Wadia WT-3200 transport. Cables were MIT, preamp the Melos headphone amp coupled with the McCormack Phono Drive.

Although TJN used as high stands as possible in the blind listening to get the panel on or below the Nelson-Reeds' woofers, I suspect from my own auditioning (which took place before I read the panel's opinions) that the speakers would have fared better had they been used upside-down, the optimal axis being nonintuitive, well below the woofer in fact. If the listener gets anywhere near the tweeter axis, the speaker sounds quite hollow, with an unpleasant, metallic peakiness in the mid-treble that makes its balance very fatiguing. All my comments therefore refer to the 5-02s used upside-down on the 24" stands.

Even with the speakers quite near the rear wall, there was no low bass, and even the midbass sounded lean. The bass warble tones on the *Stereophile* Test CD were reproduced cleanly only down to 80Hz, the ones below that frequency sounding furry as well as rolled-off. To be honest, however, you can't expect room-shaking low frequencies from a pair of woofers with a radiating diameter of just 4" each. What bass there was was reasonably well-defined, with a refreshing lack of boom; but overall, the speaker's low-frequency dynamics were severely limited. Wide-range orchestral music had to be played well below 90dB if the sound was not to mush up too much.

Moving up in frequency, the midrange was well-detailed and generally smooth, though male voices acquired a slight "quacky" coloration, which might be connected with the generally live-sounding enclosure. (Though they seem quite dead to the knuckle-rap test, listening to the walls with a stethoscope with music playing revealed a number of highish-Q resonant modes, right in the region where male voices have most of their energy.) Male speaking-voice pitch inflections also seemed suppressed, though the tom-toms on Bob Harley's drum recording on *Stereophile*'s new Test CD were reasonably well differentiated in their tone colors. (This was certainly *not* true with the speakers right-way up, when things tended to sound more alike.) Female voice, such as Dick Olsher's wife Lesley singing "Summertime" on the original *Stereophile* Test CD, sounded clean over most of their range.

Apart from the restricted dynamics, the speaker's main problem area seemed to be in the low treble, where severe peakiness emphasized the snares on drum recordings and added a rather phlegmy coloration to closely miked voice. This was too low in frequency to be described as sibilance emphasis, adding more of a "spitchy" quality. On "Walking in Memphis" on Marc Cohn's debut album (Atlantic 7 82178-2), for example, it was more as if the singer was pronouncing the Greek character "X" (*chi*) much of the time. Nevertheless, the high treble was smooth and much less grainy, and didn't call attention to itself.

What these tiny Nelson-Reeds did do well was the soundstaging thing. Lateral images were stable and precisely defined in space, moving well outside the speaker positions when appropriate, such as when Larry Archibald moves to the edges of the church on the soundstage map track on our new Test CD. They also reproduced an excellent sense of recorded ambient information, giving individual images a good sense of palpability. They certainly didn't sound too distant, unless you listen to the speakers on or above (away from the woofer) the tweeter axis. In fact, the sense of depth was not as well developed as I would have liked on my own recordings.

Overall, these tiny speakers offer about as much bass and dynamic range as you might expect from their diminutive proportions, which will rule them totally out of court for those who want a well-balanced speaker at this price point. With care taken about what axis to listen to them on, they do offer a taste of midrange transparency and soundstage excellence that will be very appealing to those who can put up with the lean balance and peaky mid-treble. The Nelson-Reed 5-02/CMs might be found useful for specialized applications or for use in a second system. Nevertheless, it must be admitted that they are expensive in comparison with such outstanding, more full-range budget performers as the Spica TC-50, NHT 1.3, and Magnepan SMGa.

Measurements: There are no surprises in the 5-02's impedance curves (fig.7): an easy-to-drive sealed box tuned to 87Hz with a minimum impedance of 5.9 ohms at 13kHz. Fig.8, the impulse response on the closest JA got to the 5-02's design axis (the measurements were all done without reference to the

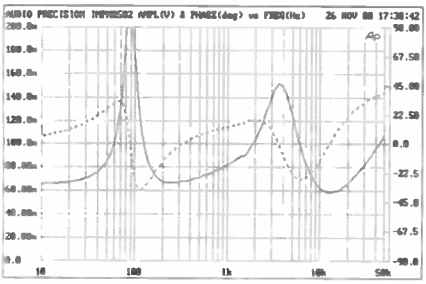


Fig.7 Nelson-Reed 5-02/CM, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.)

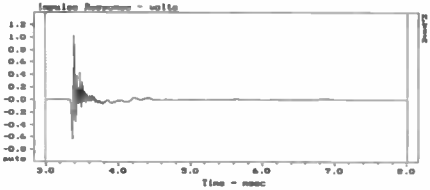


Fig.8 Nelson-Reed 5-02/CM, impulse response on woofer axis at 44" (5ms time window, 30kHz bandwidth)

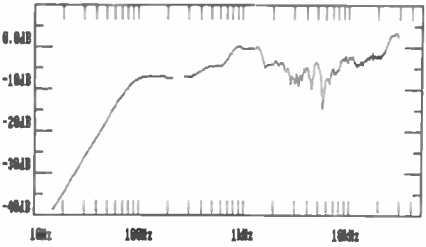


Fig.9 Nelson-Reed 5-02/CM, anechoic response on woofer axis at 44" corrected for microphone response, with nearfield woofer response plotted below 200Hz.

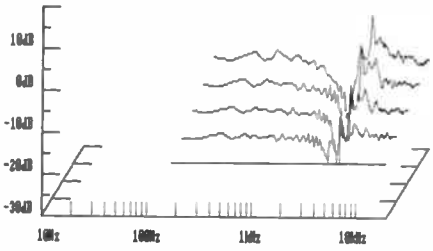


Fig.10 Nelson-Reed 5-02/CM, vertical response family at 44", normalized to response on woofer axis, from back to front: response difference 7.5° above cabinet top; level with cabinet top; on tweeter axis; midway between tweeter and woofer; reference response.

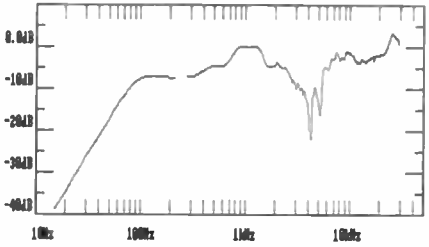


Fig.11 Nelson-Reed 5-02/CM, anechoic response on tweeter axis at 44" averaged across 30° horizontal window and corrected for microphone response, with nearfield woofer and port responses plotted below 200Hz.

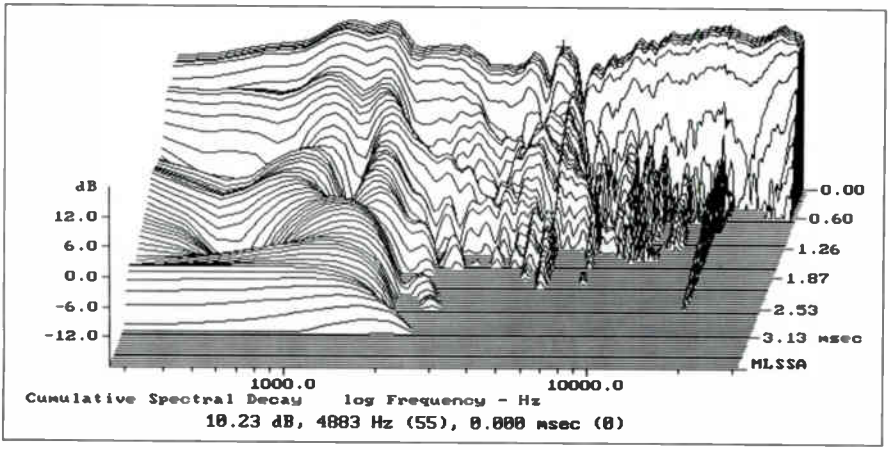


Fig.12 Nelson-Reed 5-02/CM, cumulative spectral-decay plot

owner's manuals), with the microphone level with the woofer's dustcap, is typical of a design with a low-order crossover, overlaid with some ultrasonic ringing from the tweeter.

In the frequency domain (fig.9), measured on the woofer axis, the bass can be seen to roll out early, reaching -6dB at 67Hz. This is exaggerated by the higher level of the midrange, which will make the bass sound shelved-down unless the speaker is used right against a rear wall. Higher in frequency, the transition between the two drive-units is not that well managed on this axis.

Examining the changes in the speaker's sound as the listener moves above the woofer axis (fig.10) shows a huge notch in the crossover region. (Fig.11 shows the actual response averaged across a 30° window on the tweeter axis.) Audition this speaker on what seems to be the intuitive axis and you end up with a severely colored, recessed balance. Although not shown, the 5-02 offers even horizontal dispersion, as is to be expected from such a narrow baffle.

The cumulative spectral-decay plot on the woofer axis (fig.12) reveals a series of resonant ridges in the mid-treble that undoubtedly contribute to the feeling of a metallic coloration and general spitchiness to the 5-02's sound. Note also the "knee" in this plot at 1400Hz, which could possibly be perceived as a nasality. Above 5kHz, however, the decay is clean.

BLACK DAHLIA MK.II (KIT OR DIY PROJECT; PRICE VARIES)

Description: The Black Dahlia reviewed here is an improved version of Dick Olsher's do-it-yourself loudspeaker project, first reviewed by JA in Vol.13 No.11. In addition to JA's full review, that issue also includes DO's detailed discussions of the Black Dahlia design philosophy and evolution.

The Dahlia's driver complement and loading have remained the same: a 6.5" plastic-cone Dynaudio woofer mated to an MB titanium-dome tweeter in a ported enclosure. The MB driver is the same tweeter used in the Avalon Eclipse, Hales System Two and System Two Signature, among other loudspeakers.

Where the Mk.II version differs from its predecessor is in its cabinet construction. The new enclosure has been redesigned to incorporate a 2" front baffle and an unusual side-wall sandwich construction. Most of the enclosure is made of two layers of ¾" particleboard separated by foam, the entire structure glued and screwed together. According to Dick, this method increases rigidity, improves damping, and provides resistive dissipation of shear modes. To lower the levels of reflections from the wide baffle's edges, the baffle is covered in 1"-thick foam, with holes cut out for the drive-units.

Black Dahlia Mk.II loudspeaker

The system crosses over at 3kHz, with fourth-order slopes (24dB/octave). The new version uses a different resistor in the network, resulting in an increase of 1dB in the tweeter output. The crossover is also now enclosed in a separate compartment on the rear panel.

Listening Tests Panel Score: 4.51. Given that many audiophiles have built this DIY design, JA thought it would be interesting to include it in the group. Auditioned on the second day only, the Black Dahlias came in almost dead average in the standings. JA rated them in his top group, though his comments were only mildly favorable. On the negative side, he thought the "imaging fair regarding precision, but depth less than average." He also felt the high end to be "down in the top octave." He noted that they sounded "a little raucous," and that they didn't "go loud gracefully" in the Arnold and were "rather confused-sounding" in the *Nevsky*. On the positive side, though he noted some lack of LF definition, he remarked on the "good bass

weight" on three occasions. He also praised the "good saxophone/trumpet tone colors" on the *Oxnard* and called them "musically communicative," if "rather untidy" on the drum set.

CG also placed the Dahlias in his top four. His negative comments centered on a lack of air at the top and a bit of bass heaviness. DO, though he provided no written remarks, rated the Dahlias below average. When he designed these loudspeakers, he *did* voice them with tube amplification and, knowing Dick, probably with a heavy emphasis on analog sources. That may go some way toward explaining his not very positive reaction to them here—using solid-state amplification and a digital source.

GL commented that the Dahlias were "chameleon-like." Interestingly, JA had used the same term. But GL was lukewarm toward them. Though he liked the "wide soundstage" on the orchestral selections, and the "dynamic and fast" quality on the drum set, his other remarks seemed to be largely "okay" and "so-so." Still, he rated them slightly above average.

RH also noted a lack of life in the top octave. He found the dynamics "decent" on his drum set recording, but otherwise "boxy" with "very colored snares and lower toms" on the same cut. He found that the sound glared on the *Nevsky* and was hard on the Arnold. He graded them slightly below average.

I noted some MR nasality, but found the highs open and clean, without spit or sizzle. While I liked the depth on *Oxnard*, elsewhere I found the soundstage a bit two-dimensional; there was a reduction of clarity at the back of the stage in the *Nevsky*, with slight congestion at the conclusion. The sound was punchy if somewhat forward. I commented on the Arnold that the Dahlias had a solid low-frequency response but "could use a bit more focus and inner clarity." But my overall reaction was quite positive: the Dahlias were my top-rated loudspeaker in the group.

TJN comments on the Black Dahlia Mk.II: I set the Black Dahlias up on the same Celestion stands used in the panel listening tests. Though my listening room is the same space used for those sessions, I used a somewhat different setup, bringing the loudspeakers a bit farther out into the room. Associated equipment included the Wadia WT-3200 CD transport, Audio Research DAC1-20, and an LP playback system consisting of the SOTA Jewel turntable, AudioQuest AQ PT-8 tonearm, and Signet AT-OC9 cartridge. Interconnects were AudioQuest Lapis, speaker cable AudioQuest Clear (the Dahlias were not configured for bi-wiring).

Although DO had informed me prior to my individual listening that the Black Dahlias were voiced for tube amplification—not surprising given Dick's love of tubes—I elected to start the listening with a pairing of solid-state products. The Rotel RC980BX preamp and RB980BX power amp had just arrived for auditioning. Since they sounded initially quite promising, it seemed appropriate to begin the auditioning with these modestly priced separates.

My initial reactions were very positive. While the Dahlias weren't about to challenge the Apogees which have most recently occupied the loudspeaker spot in my listening room, they performed surprisingly well. Well, not perhaps so surprisingly; both JGH and JA have had favorable comments about previous Dahlia generations. Immediately obvious was a fine overall tonal balance. They lacked a bit of extension at the frequency extremes—I would have preferred more air at the very top and a more solid deep bass. But I don't expect to get the latter in a loudspeaker of this size.

Although I didn't get the feeling of a truly deep low end—again, I didn't expect it in a loudspeaker of this size—the Dahlias did not sound lean. Bass drum, while it by no means rousted me out of my listening chair, was convincingly robust. Double bass was full and resonant, and organ had enough weight to make its weighty and sometimes awesome musical point. The bass range in general was a bit soft rather than crisp and tight, but still had good definition. There was a trace of warmth through the midbass which was not unwelcome. Instruments were neither unnaturally lean nor full, but had believable timbral weight.

Their top end was perhaps the Black Dahlias' greatest strength. They had a subtle, open, and silky quality which encouraged extended listening and kept listener fatigue out of the picture. There was plenty of detail, but without any analytical, etched, tizzy, or

bright qualities. Sibilants were natural and unexaggerated. Percussion had the needed bite without spilling over into ringing or zing. And strings were smooth. If anything was shortchanged, it was a fully developed sense of air at the very top. The sense of a large, ambient church acoustic evident on Britten's *Noye's Fludde* (Virgin Classics 91129-2) was significantly reduced over the Dahlias—as was, to a lesser degree, the feeling of air and space around individual voices. But it's also easy—and far too common—for a loudspeaker to attempt to secure these qualities by means of a hyped-up top octave. The Dahlia didn't do this.

The Black Dahlia's midrange was low in coloration and above average in openness and clarity. I initially thought I heard some subtle midrange nasality, but it was infrequent and difficult to pin down. What I did sense was a slightly closed-in, rather forward quality. There was also a tendency for the loudspeakers to "shout" at the listener over a narrow band of frequencies in the midrange. The latter was not a major concern. But the overall sound—especially the upper midrange/lower treble region—was a little "slow," with reduced snap and life. The dynamic range didn't grab my attention as often as I thought it should. And the soundstage perspective was a bit more forward than seemed entirely natural. Not in-your-lap, but enough to foreshorten overall depth and reduce the sense of palpable layering of the soundstage. Lateral imaging, on the other hand, was good. Not holographic or pinpoint, but well-defined from left to right, with a tightly defined center image.

Finally it was on to the second part of the listening test: driving the Dahlias with a tube amplifier, per DO's recommendation. I chose the Audio Research Classic 60 driven by a top-quality solid-state preamplifier—the Rowland Consummate. While this combination may seem a bit of overkill to drive a modestly priced loudspeaker, keep in mind that the Black Dahlia Mk.II is a kit with high-quality parts—comparable with those in far more expensive manufactured loudspeakers. The Dahlias were not at all embarrassed by being paired with the Rowland and Audio Research.

The most obvious gain was an increase in overall liveness, with more apparent air around voices and instruments, and the midrange more open and dimensional. While the Black Dahlias could still not be described as mind-boggling in the depth department, there was a clear enhancement of this quality, with some real sense of layering in what had before been rather foreshortened. Voices and instruments seemed more three-dimensional. Images were more clearly defined in space. Clarity was improved without in any way seeming forced or unnatural. The sound was definitely more palpably "there." The Dahlias were still a bit forward and pushy in the midrange—which restricted their ultimate transparency—but this was somewhat less evident. The Dahlia's dynamic qualities were still shaded a bit too much toward the polite. With analog LP as a source, there was a further opening up of the Dahlia's top end. And while the midrange remained forward, with analog it was a bit less insistent and more relaxed. Although the lower-powered Audio Research (60Wpc *vs* 120Wpc) did produce a slightly less punchy low end, the overall improvement from the upscale electronics was clearly and definitely audible and worthwhile. If you ignore the price. But I won't say that the difference in performance was close to the nearly 10x increment in cost of the driving electronics. The Law of Diminishing Returns remains in force.

I liked the Black Dahlias, though they definitely can profit from being used with a top-quality front-end. But even if you can't afford to feed them a Rowland/Audio Research diet, a number of less expensive tube amplifiers are available. Ultimately, I feel that DO's recommendation of a tube amplifier is a sensible one. Unlike most designers, he does not need to be concerned about such a recommendation limiting his potential market.

Measurements: Though the two DIY loudspeaker designs I reviewed in March, which used Focal and Eton woofers, showed very good pair-matching, this is not true for the Dynaudio woofers used in the Black Dahlia. This is shown in the impedance plots for the two speakers: whereas one speaker offers the twin peaks of a reflex enclosure, with a port tuned to 30Hz (fig.13), the other (fig.14) almost behaves as a a sealed box, the lower peak being reduced almost to invisibility. The matching of the inductors in the crossover network is also not good, as shown by the difference in the height of the imped-

ance peak at 3kHz (which I assume is due to different inductor-series resistances). Note also the difference in tweeter impedances above 10kHz. A strong wrinkle can be seen in both sets of amplitude and phase plots just below 300Hz, indicating a cabinet that is very lively at this frequency. Robert Harley did find his drum recording to sound "boxy," with reduced differentiation between the pitches of the various tom-toms: exactly the subjective effect of strong, narrow-Q resonances in the lower midrange.

The Dahlia's impulse response (fig.15) is typical of the genre: plenty of ultrasonic ringing from the metal-dome tweeter, with a lazy lower-frequency decay due to the high-order crossover filters. Fig.16 is a little complicated, as it shows the MLSSA-calculated quasi-anechoic responses and nearfield responses of woofers and ports for both speakers. Both speakers offer a commendably flat balance between midrange and treble—TJN noted the speaker's "fine overall tonal balance"—though the top speaker is more peaky than the bottom in the lower treble. The Dahlia's slightly subdued top octave beneath the tweeter resonance was also noted by both

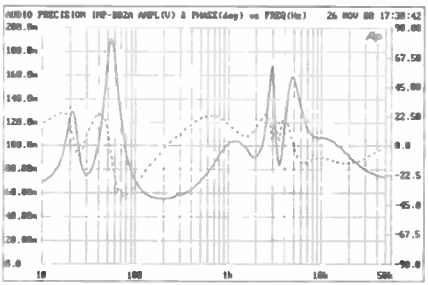


Fig.13 Black Dahlia, sample A, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.)

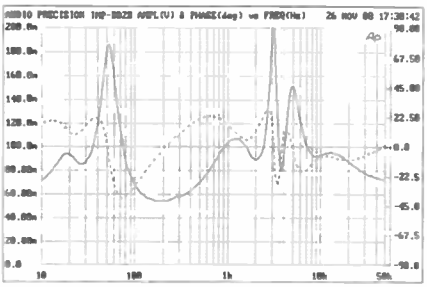


Fig.14 Black Dahlia, sample B, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.)

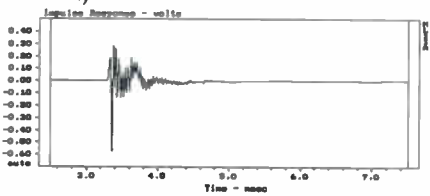


Fig.15 Black Dahlia, sample B, impulse response on tweeter axis at 44" (5ms time window, 30kHz bandwidth)

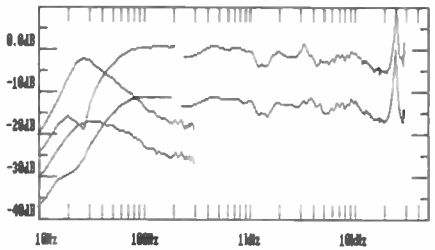


Fig.16 Black Dahlia, anechoic response on tweeter axis at 44" averaged across 30° horizontal window and corrected for microphone response, with nearfield woofer and port responses plotted below 200Hz. (Sample A, top curves; sample B, bottom curves.)

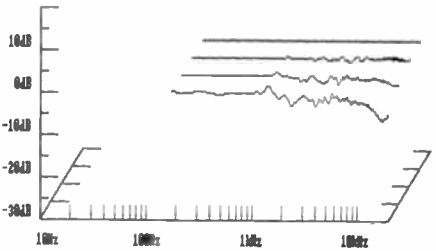


Fig.17 Black Dahlia, horizontal response family at 44", normalized to response on tweeter axis, from back to front: reference response; difference 7.5° off-axis; difference 15° off-axis; difference 30° off-axis.

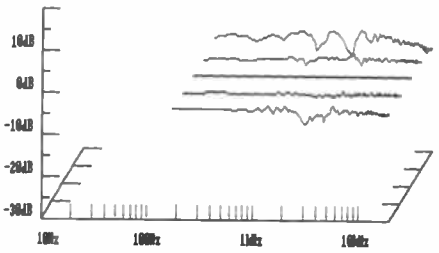


Fig.18 Black Dahlia, vertical response family at 44", normalized to response on tweeter axis, from back to front: response difference 7.5° above cabinet top; level with cabinet top; reference response; difference midway between tweeter and woofer; on woofer axis.

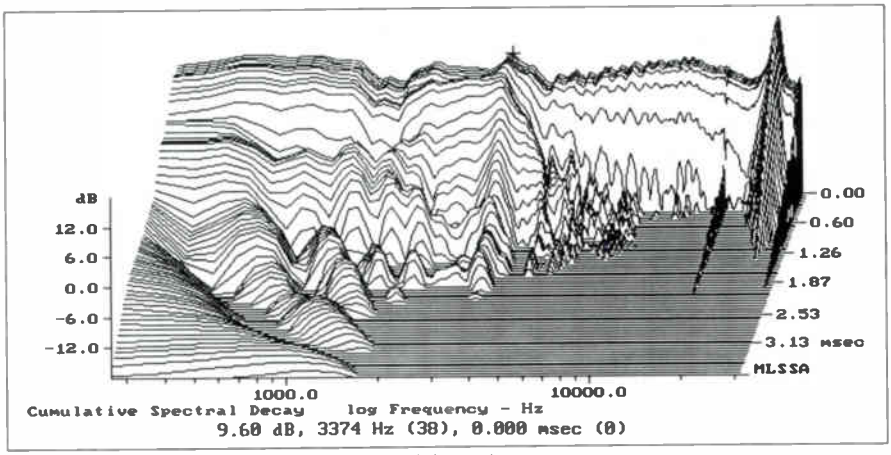


Fig.19 Black Dahlia, sample A, cumulative spectral-decay plot

TJN and the panel.

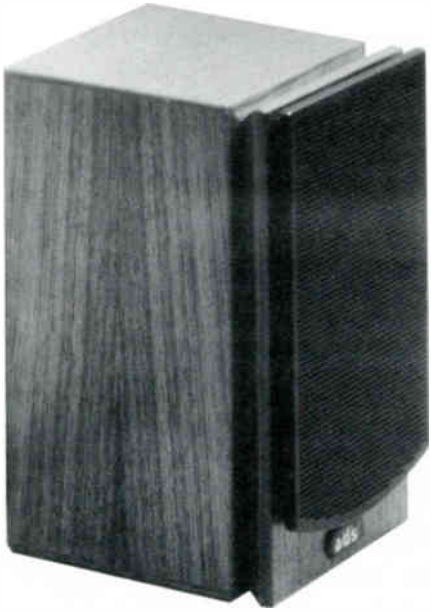
The mismatch between the two speakers in the bass is immediately noticeable in this graph, the top speaker offering typical if rather overdamped reflex behavior, the lower one behaving more like a sealed box, with a more gentle rolloff. Overall, however, the Dahlia offers good bass extension, and the subjective difference between an overdamped reflex and a quasi-sealed box didn't appear large enough to bother any of the listeners overmuch.

Fig.17 shows the changes in the Dahlia's sound as the listener moves to the side. Probably due to the foam covering the baffle, the Dahlia changes its balance by very little horizontally, even the 30° off-axis difference (front-most plot in fig.17) only showing some extra top-octave rolloff. In the vertical plane, too, the Dahlia offers excellent dispersion (fig.18).

Finally, fig.19 shows the Dahlia's cumulative spectral decay. Here are the "silky" highs that so impressed TJN and the reason this MB tweeter is so popular in high-performance loudspeakers: though the tweeter's ultrasonic peak raises the graph's noise floor, there is still almost a complete lack of resonant hash above 4kHz or so. (The dark ridge just below 16kHz is due to the computer monitor and should be ignored.) But look at the ridge at 3.3kHz. This is the same speaker whose impedance was shown in fig.13; whether this strong resonance is due to a crossover problem or to a surround problem in the woofer is hard to say without more measurements being done on the individual drive-units. Nevertheless, this behavior strongly says "nasality" to me; TJN did note some nasality in the panel tests, though the fact that this speaker was much worse than the other in this respect will explain this coloration's overall now-you-hear-it,-now-you-don't character.

A/D/S SAT 6: $800/PAIR

Description: The SAT 6 is the middle of the three-product SAT line from a/d/s. Audiophiles haven't heard much from a/d/s since the late 1970s, when they produced such



a/d/s SAT 6 loudspeaker

excellent loudspeakers as the L810 (I owned a pair for years). The company now seems to be concentrating on the mass market rather than the High End.

Both the 6″ woofer and 1″ tweeter are designed and manufactured by a/d/s. The woofer is a "copolymer" unit with a computer-designed profile for maximum rigidity and resistance to breakup. The tweeter is an unusual soft-dome, also made of copolymer. The two drivers are crossed over at 2kHz, with a Linkwitz-Riley fourth-order crossover. An automatically resetting tweeter-protection circuit disconnects the tweeter if the loudspeaker is overdriven.

a/d/s makes much of the SAT 6's distinctive appearance in their brochure. The loudspeaker's look was designed by the celebrated design firm frogdesign. The flat front baffle is sharply beveled and virtually separate from the rest of the enclosure. This not only provides an unusual appearance, but also decouples the rubber-mounted baffle from the sealed enclosure. To reduce diffraction, the baffle edges are rounded. A perforated metal grille snaps into place. The SAT 6 is available in real walnut veneer or black matte finishes. The beautifully finished walnut enclosure is made of ¾″ high-density particleboard, the black finish applied over ¾″ MDF. Two pairs of gold-plated five-way binding posts are provided for bi-wiring, these joined with a printed circuit board dual jumper for normal operation.

Listening Tests Panel Score: 4.55 (4.61 / 4.48). On the first day JA scored the a/d/s solidly average. He showered it neither with raves nor serious criticism, but noted some midrange coloration—a degree of "quack" coloration on male voice. Soundstage was rated as rather flat, bass a "bit gruff-sounding." He felt the drum set to be rather indistinct, the female vocal "slow-sounding." He liked the smooth treble and good midrange clarity on the orchestral selections, however. (Remember that his position at the front of the panel meant that he was significantly off-axis.) But while he felt the *Nevsky* to be musically involving on the first day, Day Two's slightly higher level found him uninvolved. His scores were definitely lower on the second day. The midrange coloration persisted, the bass was "lightweight." He continued to find the image short of depth and too wide, lacking in centerfill. He also felt that the lack of dynamics restricted musical involvement.

CG rated the SAT 6s well above average on the first day. He thought them a bit bass-heavy, speculating that they *must* be the Snells. On Day Two, however, his relative enthusiasm cooled. He also commented on the bass-shy balance on that day, and thought them rather forward and bright. Still, his first day's scores were high enough to put the a/d/s in his top-rated group, overall.

DO also thought the a/d/s lacked impact and transparency, and was rather closed-in and boxy. He thought the piano lacked "dynamic bloom," and the sound on the orchestral selections congested and shouty, with a gritty upper mid. He also noted a degree of boxiness on piano and female vocal.

RL, on the other hand, thought the female vocal was handled well, but felt that the accompanying ensemble got "lost." While he thought the Arnold was "very smooth" and "easy," he heard high-frequency congestion on piano. Overall, however, he liked the a/d/s better than most of the contenders.

GL rated the a/d/s somewhat below his overall average on the first day. His remarks were generally unenthusiastic in this session. He heard midrange colorations, ranging from "shouty vocal" in *Amanda* to a suckout in the Arnold. He thought Kenny Rankin's voice too chesty, and the piano to sound almost hard. But he was more upbeat on the final orchestral selection, finding it "articulate, lively, dynamic." He also liked this selection on Day Two, and scored the a/d/s higher on this second session. But though he generally liked the soundstage, his comments elsewhere were mildly critical, scoring the bass weakness on the *Oxnard* and "thin treble" on the piano.

RH, while he rated the a/d/s fairly high overall, thought them to be "uninvolving and undynamic." On *Amanda* he called them "kind of bland," with "no top-octave air"; on the jazz cut he noted "horns very laid-back, lacks immediacy." The male vocal was a "bit lacking in life." While he seemed to find nothing offensive in their sound, neither was he particularly upbeat.

SM found the a/d/s overdamped and lacking in warmth and foundation. He found complex material confused, the piano right and left hands unintegrated, with "little harmonic richness."

I also found a lack of low-end extension on Day One, but also felt that the low end that *was* there was reasonably well-defined. "A shade shy on weight," I said, referring to the *Nevsky*, "but the male chorus has some texture and detail." I found the soundstaging —at least from my rather off-axis location— relatively three-dimensional. I wasn't troubled by the midrange, but commented in several places on an excess of top end. It didn't irritate (again, perhaps that off-axis perspective helped), but it did call attention to itself on a number of selections. On Day Two I was disappointed in the a/d/s's restrained sense of power on the orchestral selections, double bass, and piano, and continued to find the high end prominent. But on a number of selections I was favorably impressed by the openness of the sound. The a/d/s did not find its way into my top group. I rated them somewhat above average, however.

DO comments on the a/d/s SAT 6: The SAT 6s are small enough to be carried under one's arm, and thus they made their entrance into my Reference room. There they were stand-mounted and driven by the Air Tight ATM-3 tube amps and a first-class front end. I didn't expect any deep bass, and there wasn't any. I did, however, expect decent imaging, and I wasn't disappointed. The resultant soundstage was wide and deep, and image outlines were reasonably well-focused in space. But after what happened next, I quickly lost interest in this speaker's imaging acumen.

As soon as the chorus erupted in full voice (Beethoven's Ninth, Chesky CD66), the SAT 6's lower treble sounded rough and screechy. Soprano upper registers sounded shrill and uneven, and there was a "tearing" distortion through the upper mids that sounded like a midget was hidden inside the box busily tearing up a telephone book.

The distortion was coupled with a bad case of congestion and a loss of dynamic range from loud to very loud. It sounded as though the speaker had hit a brick wall at peak spls in the mid-90s. Even at low volume levels, however, the SAT 6 proved sonically irritating. The treble had a ring to it, and high-frequency transients were consistently etched, which caused, for example, applause to sizzle.

Track 10 of the *Stereophile* Test CD is an excellent test of driver integration. Through the SAT 6, the Hamburg Steinway's timbre was obviously flawed. The lower registers were uneven, and there was a clangy quality to the upper registers. Gary Karr's double bass (*Adagio d'Albinoni*, King K33Y 236), a wonderful Amati vintage 1611, also lost body and heft. Ironically, this particular disc was much more listenable through the SAT 6 because the upper octaves weren't much involved.

The SAT 6's main problem appears to revolve around the transition between woofer and tweeter. Its gruff, edgy harmonic textures are symptomatic of improper driver blending: either the crossover frequency is wrong for the woofer or tweeter, or the slopes are not optimal. Joni Mitchell (*Blue*, Reprise MS-2038) brought this point home when her vocal range hovered over this region and managed to excite several resonances.

This cute little speaker proves the adage that beauty is only skin deep. Next to the affordable Spica TC-50, the significantly more expensive SAT 6 doesn't have a chance.

Measurements: The SAT 6's impedance amplitude and phase are shown in fig.20, the sealed-box tuning apparent as the peak centered on 67Hz, meaning that the a/d/s will dig deeper in the bass than the similarly sized Nelson-Reed. With a value dropping to 3.4 ohms at 200Hz, right in the region where music has quite a lot of energy, the SAT 6 will need a good amplifier to drive it without strain. I know Dick Olsher loves classic tube amplifiers, but fig.20 implies that they're not really recommended for use with this speaker.

The impulse response on the tweeter axis (fig.21) is clean, with very little ringing apparent, though the use of fourth-order filters ties in with the lazy lower-frequency decay. Turning to the frequency domain (fig.22), the SAT 6 offers a distinctly unflat response on

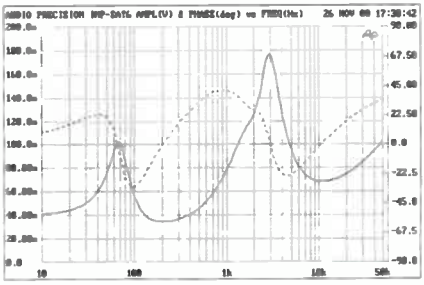


Fig.20 a/d/s SAT 6, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.)

the tweeter axis, there being an excess of energy in the top two octaves and a large suckout in the crossover region. Here are the explanations for the listeners' comments of "thin treble," "an excess of top end," "etched HF transients," "lack of integration," and "suckout." The nearfield bass is classic small sealed-box, though the in-room measurement did indicate a degree of underdamping, which might correlate with the SAT 6's apparent bass weight as noted by some listeners.

Looking at the manner in which the SAT 6's sound changes as the listener moves to the side (fig.23) reveals that the on-axis crossover notch does fill in for off-axis listeners, which to some extent explains the disparity in the panel's comments on the speaker's midrange and low treble. RH in the third row

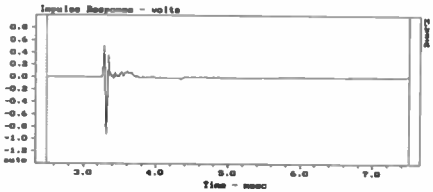


Fig.21 a/d/s SAT 6, impulse response on tweeter axis at 44" (5ms time window, 30kHz bandwidth)

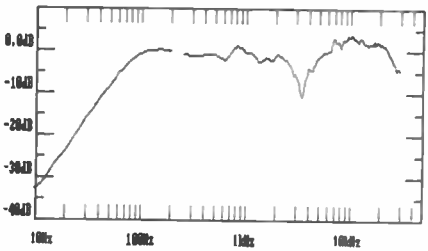


Fig.22 a/d/s SAT 6, anechoic response on tweeter axis at 44" averaged across 30° horizontal window and corrected for microphone response, with nearfield woofer response plotted below 200Hz.

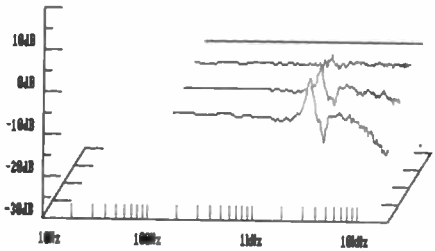


Fig.23 a/d/s SAT 6, horizontal response family at 44", normalized to response on tweeter axis, from back to front: reference response; difference 7.5° off-axis; difference 15° off-axis; difference 30° off-axis.

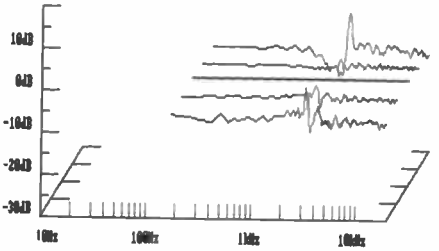


Fig.24 a/d/s SAT 6, vertical response family at 44", normalized to response on tweeter axis, from back to front: response difference 7.5° above cabinet top; level with cabinet top; reference response; difference midway between tweeter and woofer; on woofer axis.

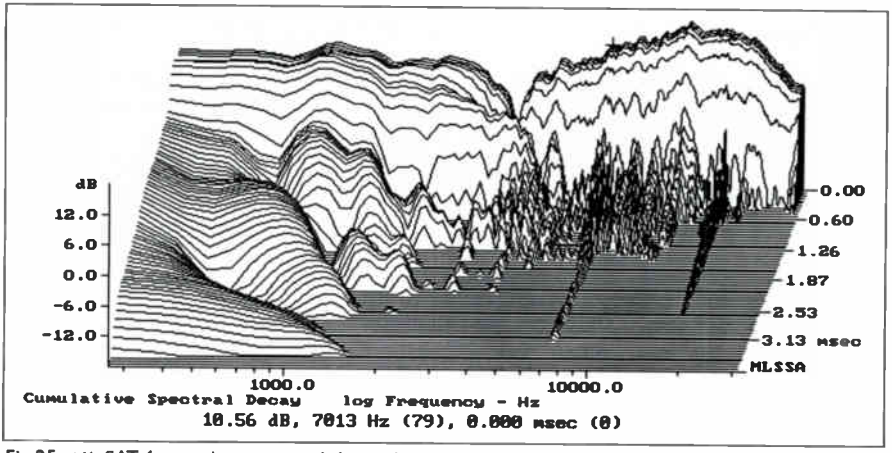


Fig.25 a/d/s SAT 6, cumulative spectral-decay plot

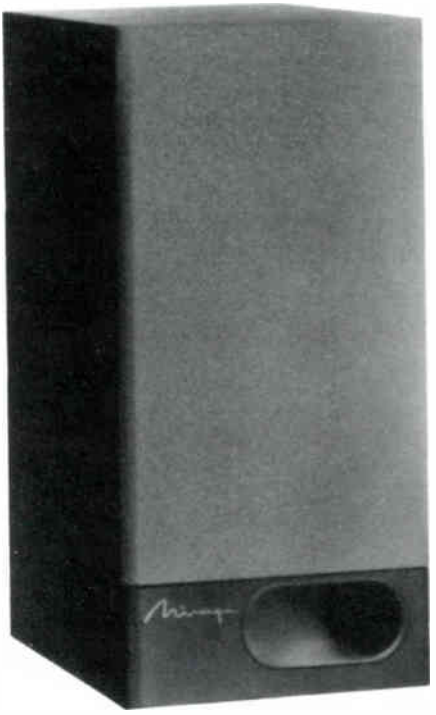
was well off the speaker axis, however, hence his comment on the SAT 6's lack of "top-octave air." In the vertical plane (fig.24), the notch stubbornly refuses to fill in. In fact, with the speaker on low stands so that the listener can see the cabinet top, it gets even deeper. A fourth-order Linkwitz-Riley crossover as used here needs the woofer and tweeter to be connected with the same polarity. I suspect that, in the SAT 6, they've been connected with opposite polarities, which would explain the measured on- and off-axis response curves.

The SAT 6's cumulative spectral-decay or "waterfall" plot is shown in fig.25. The treble is a little hashy, with a resonant mode apparent at 7kHz—is this DO's treble ring?—though the overall decay trend in the treble is even with frequency. There's a hint of resonant behavior around 1kHz, though the graph's frequency resolution is not good enough in this region to clearly show what is happening. Listening to the beautifully veneered cabinet walls with a stethoscope revealed high levels of side-wall vibrations, with a very "honky" character. Snatching a quick listen to the SAT 6s after the measurements had been done confirmed DO's feeling of congestion to their sound, with a limited dynamic range. The entire midrange seemed affected, cellos and male voice sounding boxy and wooden; oboes and piano sounded hooty and strident. In addition, the stereo image pulled to the speaker positions in the midrange, always a sign of cabinet problems, in my experience. Overall, both measured performance and sound quality are disappointing for what is quite an expensive minimonitor.

MIRAGE M490: $600/PAIR

Description: The Canadian loudspeaker manufacturer Mirage is best known among audiophiles for their highly regarded M-1 and M-3 models. The company, however, also makes a line of more affordable products, called the 90-Series. The M490 included in this survey is the middle of the 90-Series line, with two products below it and two above.

The M490 is an 8" two-way system in a vented enclosure. Its most distinguishing feature is the forward-mounted tweeter protruding from the enclosure so that it fits flush into a cut-out in the grille frame. This reportedly reduces diffraction from the frame and improves off-axis dispersion. The port, located at the front bottom of the cabinet, has an unusual asymmetric sculpted look to reduce port noise. The ¾" fiberboard enclosure boasts computer-designed internal bracing and damping materials.



Mirage M490 loudspeaker

Both the 8" polypropylene woofer and 1" PTH™ (Pure Titanium Hybrid) tweeter are designed and manufactured by Mirage. The tweeter's titanium dome is mounted in a low-mass cloth suspension system. This technique reportedly reduces distortion and improves transient response; the cloth absorbs ultrasonic ringing.

Crossover frequency is 2kHz, with first-order low-pass and third-order high-pass slopes. Polyester and polypropylene capacitors are used throughout. The M490 provides two pairs of gold-plated five-way binding posts for bi-wired connection. Finishes available include a black-ash vinyl with grey grilles and dark oak with black grilles.

Listening Tests Panel Score: 4.69 (4.61 / 4.76). JA liked the Mirages quite a bit on Day One, declaring them "a winner!" His reser-

vations were concentrated in the bass region, which he found extended but lacking in clarity, with thickened upper bass. Above the bass, however, he had generally favorable reactions. He commented on two occasions on the M490s' "palpable presence," and liked the "wide and deep soundstage" and " 'big' sound." He noted the xylophone's well-defined pitch centers in *Nevsky*, and the clarity and "easy-to-listen-to" quality of the orchestral selections. He wrote that, as Amanda McBroom sang "Oooh Amanda," he became aware for the first time that her voice was doubled by a harmonica. On Day Two, however, his scoring of the Mirages dropped more than a notch. Perhaps the slightly higher playback level enhanced his sensitivity to its overall low-frequency response; he was more critical of the clarity in the bass, referring to it on two occasions as a bit "boomy." He still praised the bass extension, but found orchestral climaxes to sound rather coarse and grainy at the top. Overall, however, his high rating on Day One managed to pull the Mirages into his top-ranked group.

CG, on the other hand, definitely disliked the Mirages on Day One, thinking them too bright and lacking in depth. Kenny Rankin's sibilants were "spitty," the Arnold's horns "too blatty," the *Nevsky*'s highs "quick to harden." CG also noted the lack of a distinct bass line. On Day Two, however, perhaps the higher level opened up the Mirages for him. He thought the double bass and harp had "decent clarity." He still thought the highs were "a little piercing" on the *Nevsky*, but otherwise did not criticize them as he had on Day One. He continued to note some bass overhang, but it didn't pull down his scores to any extent. Overall, however, he was not favorably disposed toward the Mirages.

DO's scores were rather low for the Mirages, which did not keep them from sneaking into his top group. RL did not rate them highly. He thought them very listenable on the piano selection, but on the orchestral selections was underwhelmed—commenting that he heard a "generic" orchestral sound which didn't make him care overly much about the music. On the Kenny Rankin, he thought "KR sounds like he's singing through a cereal box, piano and voice not 'happening together'."

On Day One GL liked the Mirages better than RL, though he was not effusive. He thought the male vocal "hooty." He noted the "excellent detail" to the drum set recording, but commented on a rather brittle sound on the same selection. He found Amanda's voice "quite nice." Though his overall reaction was positive, he found the sound lacking in sparkle. Day Two, with its somewhat higher level, was a different story. GL found the "best bass so far," the sound "involving." Bass drum had "good weight," the orchestra also involving and "articulate." He noted a "good sense of space and separation," with "excellent detail. It was not surprising that the Mirage proved to be GL's favorite loudspeaker of the bunch.

RH, on the other hand, found the bass of the Mirages to be too fat and bass-heavy. This may have been why he felt that the male vocal was congested. He commented favorably, however, on the dynamics and extension on the drum set and the decent soundstage on the *Nevsky*, but continued to be bothered by the low end.

SM agreed with the others that the Mirages were heavy in the bottom end, a "good foundation but lacking in definition." He found the attack to be "thick" on the drum set, with "mediocre dynamics." He commented on a problem in the high end on the piano recording, referring to it as a "modulation halo." And he felt the soundstage to be "muddled," with "no front-to-back stage" on the orchestral selections. Still, his rating numbers allowed the Mirage to creep into his top-rated group.

On the first day I felt that the Mirages were a bit too laid-back, somewhat reticent in the upper-bass/lower midrange power region, and rather prominent in the highs. The male chorus on *Nevsky* was too laid-back, the piano shy of weight. I commented in a number of places on the prominent treble. On the orchestral selections I was too conscious of the overtone structure of voices and instruments, the top end "a trace crisp and dry." Still, I noted good clarity and focus on the drum set. My scores were higher on Day Two. Now there was definitely more warmth and body to the sound—perhaps a bit too much, but overall I felt it to be a plus. I commented on several selections on the good weight—on the orchestral selections it gave a welcome sense of "majesty" to the sound. My summation on the *Nevsky* reads "Yeah! Okay, highs are a trace dry, but the chorus

is open, the body is right, good three-dimensionality and depth, not congested to the same degree as some, good presence." I liked the M490s well enough, but they didn't make it into my top-rated group.

GL comments on the Mirage M490: The panel listening was finished and the participants were relaxing with soft drinks and two-day-old donuts when Tom Norton asked us to choose from slips of paper containing the names of the speakers we would take home for one-on-one listening. The thought was daunting, since throughout the two-day listening sessions, *none* of the speakers, to me, stood out as much more than mediocre, with several sounding distinctly *below* average. Hopefully, intimate exposure to the speakers by the participants, in different rooms and with a variety of electronics, would reveal a few "sleepers."

I was optimistic about this possibility, since I came away from this experience with a noticeable lack of enthusiasm—for audio *and* music. Besides being almost unbearably mentally and physically fatiguing, the testing process left me with serious doubt concerning the validity and, more important, the efficacy of the entire event. Based on what I heard in *my* listening room, I found it hard to believe the speakers marked on the little scrap of paper I drew out of the hat to take home for review (Mirage M490s) were the same pair I heard in *Stereophile*'s listening room.[7]

At the time of the panel listening, I was in the middle of an equipment review so I didn't want to move my M-3s out of the room just yet. Not wanting to let the M490s sit idle, I set them on the supplied 21" API SST stands on either side of my Sony 25" XBR Pro monitor, disconnected the leads to the Sony speakers, and hooked up the Mirages. With only 15W of questionable power available, I wasn't expecting to hear great sound. I didn't. However, while watching John Sayles's superb 1984 film, *Brother From Another Planet*,[8] I became aware of an entire layer of bass I hadn't heard before, especially on Lee "Scratch" Perry's "Pussy-I-Cocky-I-Water." Hmmm, thought I. Wonder what these will sound like in a good system?

They sounded GREAT! Gobs of articulate, extended bass, lush midrange, and non-fatiguing highs. In addition to preserving the timbral qualities of the instruments (and voices) which *make* music, the Mirages did an excellent job at retrieving the generation of harmonics and their interplay, regardless of whether the notes were struck, bowed, or blown. There was no ambiguity in this area. The loudspeakers were performing their tasks as transducers with equanimity. In fact, once I'd established optimum room placement for the M490s, I could sit back and enjoy a musical event delivered in a way which reminded me a lot of what I was accustomed to hearing on my M-3s. There was a striking family resemblance to the sound. The smoothness of the overall portrayal which characterizes the sound of the M-3s was present on the more humble sibling, though not to the same degree. The M490s also suffered a bit in the area of "finesse" when compared to their pricey big brothers. Although all the performance details were captured on the M490s, it's as if they occasionally needed deburring.

The sound of the M-3s in my system is comparable to the colors rendered on Fuji's Reala print film—soft, yet revealing and romantic. The sound of the M490s in my system is more like the rendering of a scene on Kodak's Ektar—sharp and dramatic, with romanticism an afterthought rather than a goal. Just as both films capture a scene, both speakers re-create a musical event. The difference between them is in the way I, as a listener (or viewer), respond. In the case of the M490s, my response was one of involvement. Each record or CD I played became a surprisingly compelling event. My mind was locked onto the music in a way which I rarely experience listening to so-called "cheap" speakers. My only extramusical thought was how I judged the sound of these speakers to far exceed their price, and what a great deal I thought they were.

The "good system," incidentally, consists of a Roksan Shiraz MC cartridge mounted in a (fully tweaked) Eminent Technology 2 tonearm atop a VPI HW-19 Mk.IV turntable. CD playback consists of a Meridian 602

7 Regular readers will know of my adulation for the Mirage M-3s—they've occupied pride of place in my reference system ever since I snatched them away from Tom Norton almost a year ago. It was *purely* coincidental that I was to take the M490s home.

8 This soundtrack is a *must*-have. It's available on vinyl (no CD yet, ha-ha!) from Daring Records, Box 793, Marblehead, MA 01945. The catalogue number is DR 1007. Grab it while you still can!

transport feeding either a Meridian 606 or Theta DS Pro Prime processor. The coaxial connection is Ensemble's Digiflux cable. All other interconnect is AudioQuest Diamond Hyperlitz. Speaker cable is bi-wired AudioQuest Sterling. The preamp is a VTL Ultimate, and a pair of Manley Reference 200/100W Triode Switchable Monoblock power amps complete the chain.

Sounds like overkill? Maybe, but I wanted to give the M490s the best shot I could. It has been my experience that modest loudspeakers can sound magnificent when fed with good electronics and a decent front-end, whereas expensive speakers fed by indifferent electronics with equally ordinary front-ends will always sound. . . mediocre. One of my fears is that prospective customers will only get the opportunity to audition these speakers with the ubiquitous receivers seen overflowing dealer shelves. *Insist* on an audition using separates. To show you how misguided popular myth is in regard to sound reproduction in the home, I recently read in a promotional brochure that the *speaker* end of the chain is where one should invest the heaviest. Bunk! Don't believe it for a second. As I discovered during the course of my listening, speakers like these benefit from as fine a front-end as you can afford. Don't pinch pennies there, and you'll be rewarded with outstanding sound. If you're at a hi-fi store and the salesman insists on selling you expensive speakers by trimming the budget at the front-end, *run*, don't walk, to the nearest exit.

As with any speaker, careful placement of the M490s within the room was *essential* to achieving good sound. I spent a lot of time moving them around, listening, then moving them around again, etc., before I settled on the arrangement used for final listening and evaluation. These are *not* bookshelf speakers; another of my fears is that they'll end up being placed there in many homes, thus diminishing their exceptional sound quality and shortchanging the purchasers' investments. These speakers deserve better. I found them to sound their best placed approximately 48″ from the rear wall, toed-in slightly, and at least 2′ from the side walls. Though not bipolar radiators, these babies need room to *breathe*! With the speakers so positioned, my ears were approximately 5′ from the front plane of the grilles. My listening seat puts my ears about 39″ off the floor. For best results, the midline of the tweeter should be the same height from the floor. The 21″ stands were not tall enough to achieve this, so I removed the rather short spikes which came with the stands and put Arcici Super Spikes in their place. These much taller spike "assemblies" brought the speakers to within ¼″ of the desired height.

I did the majority of my listening with the grillecloths *on*, as this is the way *I* listen to speakers. I felt this is the way they'll be used in the most homes.[9]

The speakers are bi-wireable, and I found this configuration to give the best sound. For instance, there was more "bloom" to the bass, especially noticeable on Rickie Lee Jones's outstanding new recording, *Pop Pop* (Geffen GEFD-24426), where Charlie Haden's string bass assumes an almost palpable presence in the room, each note seemingly "rolling" off the strings toward the listener. In addition, the highs opened up a bit, improving resolution and speed. The cymbals toward the end of "Caledonia," from Dolores Keane's self-titled album (DKLP 1), had less smearing, with more shimmer and less "splash," making them sound like struck brass. Soundstaging was enhanced as well, and there was a noticeable increase in "air" around both instruments and vocals. Keane's "Mouth Music" was stunning. The presentation of the vocalists, flanked by the drums, was exciting and believable.

To say I was impressed with these speakers is an understatement. Their sound rivaled that of speakers costing *much* more. I consider them strong Class "C" loudspeakers. These are speakers for the music lover who wants to enjoy his/her library of recordings. The perfectionist might be less inclined to embrace them as I have: there was an occasional, barely perceived "hardness" in the lower treble range (mainly noticeable on certain female vocalists); they also exhibited a slightly truncated soundstage depth relative to other speakers I've encountered (especially the M-3s, which are champions at depth retrieval).

9 The debate over whether or not to leave grillecloths on loudspeakers is, to me, silly. With the exception of, for example, the Celestions, most loudspeakers I've seen come with some sort of acoustically transparent fabric covering their front (and/or rear) face. In fact, some speakers—the Mirage M-3s, for instance—make the grillecloth difficult to remove. Besides lessening a loudspeaker's cosmetic appeal, removing the grillecloth makes the drivers more susceptible to damage. I say LEAVE 'EM ON and accept the often negligible sonic degradation.

Soundstage width, however, is fine: on several occasions, I was aware of instruments placed well to the side of the speakers. Images at all points within the soundstage were well-focused, stable, nearly holographic. Ambience recovery was excellent as well, with changes in recording venue easily discerned. At $600/pair, I feel the Mirage M490s are a steal. Other speaker manufacturers who hope to compete should listen long and hard to these babies. With their excellent dynamics and superb sense of "rhythm," they're capable of bringing *excitement* into the listening room. And *that* is a quality worth seeking in these days of insidious nonchalance. I'm buying the review pair!

Measurements: Fig.26 shows the Mirage to be a straightforward, easy-to-drive reflex box with a port tuned to 38Hz. The fact that the lower peak is higher than the upper one hints at a somewhat underdamped alignment, however, while the glitch in the curves at 275Hz is evidence of a cabinet resonance at that frequency. (Listening to the walls with a stethoscope revealed the side wall to be very lively in two regions, though the back wall was quite inert.) The speaker's impulse response (fig.27) also holds no surprises.

Transforming from the time to the frequency domains, to the left of fig.28 is shown the M490's nearfield woofer and port responses. Again suggesting a rather underdamped alignment, this ties in with the panel's auditioning comments, which were unanimous on the nature of the '490's bass but divided as to whether it was good or bad. If you want a big, rather bass-heavy sound, you should give a listen to this Mirage, though it will become "boomy" or "fat" with some amplifiers. But look at the right

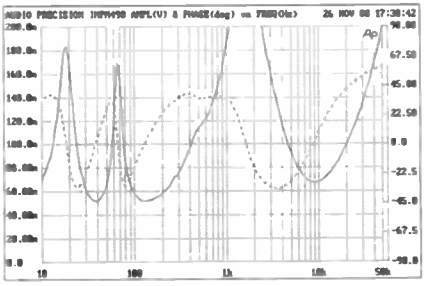


Fig.26 Mirage M490, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.)

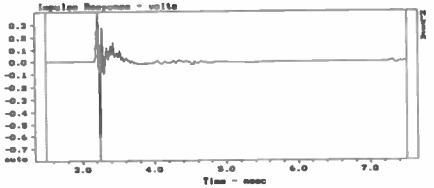


Fig.27 Mirage M490, impulse response on tweeter axis at 44" (5ms time window, 30kHz bandwidth)

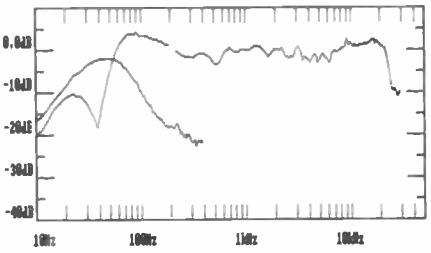


Fig.28 Mirage M490, anechoic response on tweeter axis at 44" averaged across 30° horizontal window and corrected for microphone response, with nearfield woofer and port responses plotted below 200Hz.

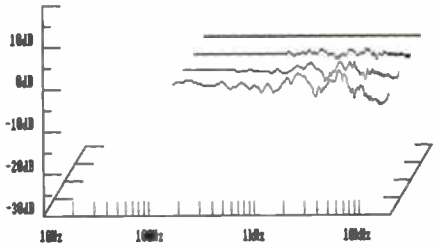


Fig.29 Mirage M490, horizontal response family at 44", normalized to response on tweeter axis, from back to front: reference response; difference 7.5° off-axis; difference 15° off-axis; difference 30° off-axis.

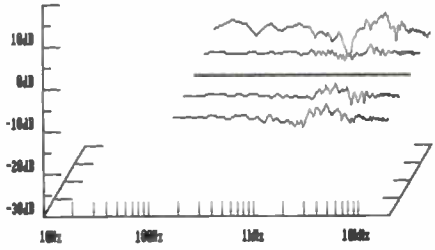


Fig.30 Mirage M490, vertical response family at 44", normalized to response on tweeter axis, from back to front: response difference 7.5° above cabinet top; level with cabinet top; reference response; difference midway between tweeter and woofer; on woofer axis.

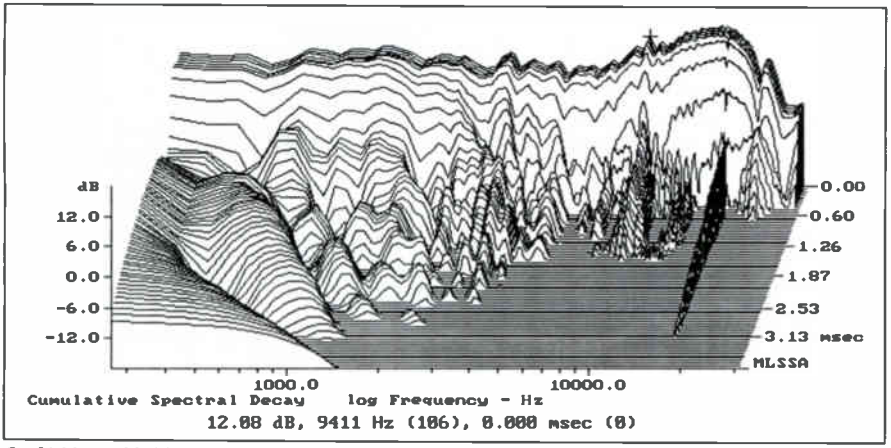


Fig.31 Mirage M490, cumulative spectral-decay plot

of fig.28. That is one flat, neutral-sounding response throughout the midrange and mid-treble, with only a slight excess of energy in the top octave and a half leading to comments of a top end that was "a trace crisp and dry."

In the horizontal plane (fig.29), the M490 becomes a bit peaky in the low treble, meaning that it definitely should be listened to on-axis. Note, though, that these measurements were performed with the speaker's grille, which is designed to minimize diffraction problems in the treble, removed. However, side-walls that are too close, as GL found using the speakers with the grilles on, will detract from the speaker's neutral balance. In the vertical plane (fig.30), the speaker also shows generally good dispersion, though the rearmost plot, taken 7.5° above the cabinet top, reveals that a crossover notch develops for listeners standing at the back of the room.

Finally, the Mirage's cumulative spectral-decay plot is shown in fig.31. A generally smooth and even decay is broken by two regions of hashiness: one centered on 9.4kHz, the other around 3kHz. Both might contribute to the "spittiness" noticed by some listeners on sibilance.

All in all, the M490 is another fine-sounding, fine-measuring, inexpensive loudspeaker from the Great White North.

PINNACLE PN8+: $460/PAIR

Description: The $460/pair PN8+ features Pinnacle's patented Diaduct™ (diagonal duct) port. Rather than use a narrow tube mounted perpendicularly to the baffle, the Diaduct technique uses a much larger duct angled inside the cabinet. This gives the PN8+ its unusual oval-shaped ports. By increasing the duct's length, the diameter can be increased commensurately. The Diaduct venting system reportedly increases bass output from a small enclosure and reduces wind noise from the port. The PN8+ incorporates two Diaduct ports, both firing forward.

An 8" mineral-filled polypropylene woofer is mated to a 1" dome tweeter. The polyamide diaphragm tweeter dual rear chamber reduces diaphragm resonance and features magnetic liquid cooling. The crossover uses a first-order slope, with a cutoff frequency of 2.2kHz. Polypropylene and metallized polyester film caps are used throughout. The enclosure is made of ¾" industrial-grade particleboard finished with solid oak accents.

Listening Tests Panel Score: 4.90 (4.68 / 5.12). Scoring well above average overall, five of the panel members placed the Pinnacle among their top four choices. JA rated it a bit higher on the second day, but overall his reactions were consistent from Day One to Day Two. He thought the highs a bit emphasized in the sibilance region, though otherwise smooth. A degree of thinness noted on Day One fleshed out at the 2dB-higher level used on Day Two. JA then found the bass perhaps a "little boomy" on one selection (Eccles), but was otherwise favorably impressed by the good bottom-end weight on bass drum and double bass. The midband also came in for favorable comment, with convincing voice and piano reproduction. Though the chorus tended to harden at higher levels on

the *Nevsky*, depth and midrange clarity held up. "A big, easy sound, with good detail and sense of soundstage space," he wrote. "A bit sibilant, but a well-managed tonal balance."

CG didn't like the Pinnacles much on Day One, though they weren't far off from his average on that day. He downgraded them for lack of bass, lack of air and space, and a tizzy top end. On Day Two, however, his opinion was higher. He still felt them to be "a little bright," but liked their depth and midrange clarity. "Very nice to listen to," he wrote in commenting on the piano recording; "really lets the piano breathe." Though he thought the overall bass a bit subdued, he did like the way he was "finally" able to "hear the bass line."

A minority report was filed by RL, DO, and SM. RL thought them "boxy, small, and limited in dynamics" on the drum set, and generally unimpressive based on his comments—though he did score them about average. DO commented favorably on their bass impact on the Arnold, but otherwise thought them lacking in clarity and congested. SM found them lacking in foundation and overdamped—though he liked their low end on the drum set. He also was not impressed with their sense of stage and room.

GL came in on the positive side. On Day One he had some negative comment—he thought the sound generally a little lightweight overall. But the Pinnacles came to life for him late in the session on the *Nevsky*. On Day Two he was a bit more bothered by midrange colorations on the *Oxnard* cut and was unmoved by the Kenny Rankin, but on the final four selections the loudspeakers picked up steam. "Amanda's voice has some body, good soundstage, airy presentation," he wrote on the female vocal. He also liked the bass-drum impact and depth on the Arnold, the airy, delicate, detailed sound on piano, and the good vocal articulation and believable orchestral scale and "heft" on the *Nevsky*.

RH was also favorably impressed. Though he mildly criticized some "one-note bass" on the *Oxnard*, he was favorably disposed toward the LF extension, good overall balance, and detailed, articulate, dynamic, punchy sound. "Greater feeling of images hanging in space," he wrote, commenting on the *Nevsky*; "good depth and resolution of individual lines."

I also liked the Pinnacles, more perhaps than I did later in my individual audition. I definitely liked the sense of space and soundstaging the Pinnacles presented. While I heard some boxiness on a number of selections, I did not criticize it heavily or downgrade my scores because of it. I, too, mildly criticized the sibilance region, but was particularly impressed by the clarity and lack of congestion on the *Nevsky*. Overall, I felt the LF impact was good, the LF clarity better, the highs a bit dry, the mids slightly colored, but the overall presentation definitely well above average for the group.

Pinnacle PN8+ loudspeaker

TJN comments on the Pinnacle PN8+: I auditioned the Pinnacles using the same associated equipment and listening position I'd used to audition the Black Dahlias. Like the Dahlias, the Pinnacles were only configured with one set of terminals, so biwiring was not used. The grilles were removed.

Beginning with the Rotel amplification, the listening began on a fairly positive note. Through the midrange I noted some boxiness, but it was not a serious distraction. The

bass range was quite clean, though definitely on the lean side. While an occasional tendency to blurring on certain notes in its range was noted, double bass was generally clean and tight. There was a lack of body to instruments with extension into the lower registers—bass drum was missing real weight, its skin tone emphasized more than its fundamental. Still, the low end was generally free of boom and muddle. There was also good clarity up through the mid- to upper-bass region.

Imaging was precise, with believable lateral focus and depth. But continued listening revealed problems, foremost in the top end. There was a coolness, almost a coldness, to the sound on many familiar recordings. High-frequency transients were particularly prone to take on a "hot" quality, with more than a hint of zing. The Pinnacle did *not* fall into the ear-burner category—its brightness was not an immediate turn-off—but its top end made long-term listening difficult. Ambience was hardened and brightened, piano sometimes clangy.

That trace of midrange boxiness noted above became somewhat more obvious on a number of recordings, male vocal the most frequent offender. Yet it never really disturbed me. What did bother me was a trend to hardness in the upper end of close-miked vocals. Some of the blame here may well be in the recordings, yet the same recordings on other (admittedly more high-end) loudspeakers did not demonstrate it to the same degree.

Still, the PN8+ was promising in a number of ways. What would it sound like with better driving electronics? To find out, I hooked up the Rowland Consummate preamp and Audio Research Classic 60 power amp. Despite GL's and JA's recommendations, it's unlikely that anything like this grade of amplification will ever be used to drive the Pinnacles, but it seemed only fair to try the combination; I'd also used it in my review of the Black Dahlia.

Matters improved noticeably with the high-end electronics. Now the Pinnacles' positive qualities asserted themselves. The soundstage on *Mokave, Vol.1* (AudioQuest AQ-CD1006) was precise. I won't say that either imaging or depth would challenge any state-of-the-art design, but both were far more than acceptable in this price range. There was a good overall sense of air, and the low end remained tight and clean, if a little lean as before. Yes, there was still some boxiness, but the improved depth and three-dimensionality made it rather innocuous on 90% of the program material I sampled. Perspective, which before had been just a shade forward, was improved. Piano was less forward and jangly than before. It wasn't so much that the improved amplification eliminated the Pinnacles' problem areas as that it made them less relevant by strengthening the loudspeakers' strengths.

But it could not eliminate that high-frequency problem. That occasional edge to the upper end of vocals remained, while hard transients generated the desire to turn the whole thing off. Strangely, the problem didn't seem to affect sibilants. Cyndee Peters singing, *acapella*, "I Ain't Got Long" on the Cyndee Peters/Eric Bibb collection (Opus 3 CD 7706/03), was *very* convincing and involving; the entry of percussion on other cuts, however, caused the sound to become aggressive.

Still, I can't deny that, with the up-scale amplification driving them, the Pinnacles could hold my attention. When I sampled Britten's *Noye's Fludde* (Virgin Classics 91129-2) over the PN8+s, I found myself listening longer than I'd planned. There was certainly some muddle and glare as the going got intense, but the soundstage layering, precision, and overall perspective kept the CD turning.

In order to sort this out a bit more, I listened briefly to the Mirage M490s which GL had just brought back from his individual auditioning. The Mirages were clearly more extended in the low end, giving voices and instruments a fuller, more natural timbre. The tradeoff here was a reduction in tautness. But the tradeoff favored the Mirages. In the midrange, the Mirages had less coloration, although the difference here was not pronounced. And the M490s were better controlled in the brightness region, though they seemed a shade dryer, grainier, and more sibilant at the very top. In the Pinnacles' favor was a superior soundstage and better sense of depth and dimensionality. Also a higher sensitivity—significant if your amplifier power is limited. Still, the Mirages came out on top in sound. And finish. But they *do* cost about 33% more—$600/pair *vs* $460/pair. The lower in price you go, the greater differ-

ence such a price gap *should* make.

Ultimately, I had continuing reservations about the Pinnacles' top octaves. The problem was not distracting on all program material, but correcting their rather overjuiced brightness region would be a real plus. The problematic treble may also make matching to associated equipment tricky—especially with the modestly priced systems in which such loudspeakers are most likely to be used. I can at least recommend an audition, though you may find that they need a more expensive diet than you plan on feeding them in order to make the best use of their strengths.

Epilogue: I very briefly tried the Pinnacles closer to the rear wall—not an easy feat in my listening room because of the wall configuration and general room layout. There was a marginal gain in the mid and upper bass, which unfortunately sacrificed the tight low end, which is one of the Pinnacle's strengths. The rest of the range seemed more colored than before, and the soundstage suffered noticeably.

Pinnacle discusses the effect of different room positions on a loudspeaker's sound in their instruction manual. The latter, incidentally, is perhaps the best manual I've ever seen for a loudspeaker of anywhere near this price—with the notable exceptions of Wilson and Avalon. I should also point out Pinnacle's seven-year, transferrable warrantee.

Measurements: Like the more expensive Mirages, there are no surprises in the Pinnacle's impedance plots (fig.32). Here is a normal reflex box with a port tuned to 36Hz. The drop to 5 ohms or below between 100Hz and 500Hz shouldn't ask for too much current from all but the very cheapest

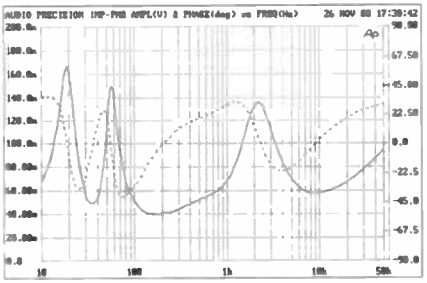


Fig.32 Pinnacle PN8+, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.)

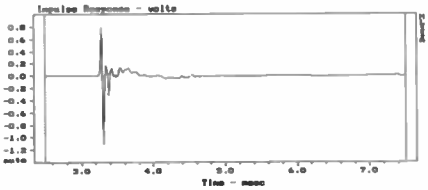


Fig.33 Pinnacle PN8+, impulse response on tweeter axis at 44" (5ms time window, 30kHz bandwidth)

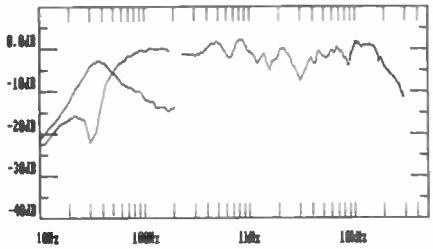


Fig.34 Pinnacle PN8+, anechoic response on tweeter axis at 44" averaged across 30° horizontal window and corrected for microphone response, with nearfield woofer and port responses plotted below 200Hz.

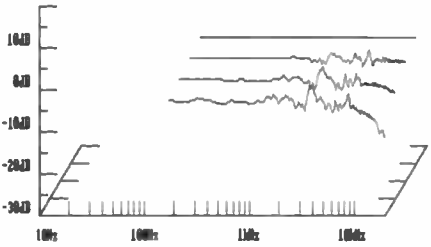


Fig.35 Pinnacle PN8+, horizontal response family at 44", normalized to response on tweeter axis, from back to front: reference response; difference 7.5° off-axis; difference 15° off-axis; difference 30° off-axis.

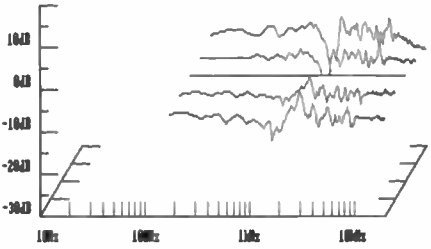


Fig.36 Pinnacle PN8+, vertical response family at 44", normalized to response on tweeter axis, from back to front: response difference 7.5° above cabinet top; level with cabinet top; reference response; difference midway between tweeter and woofer; on woofer axis.

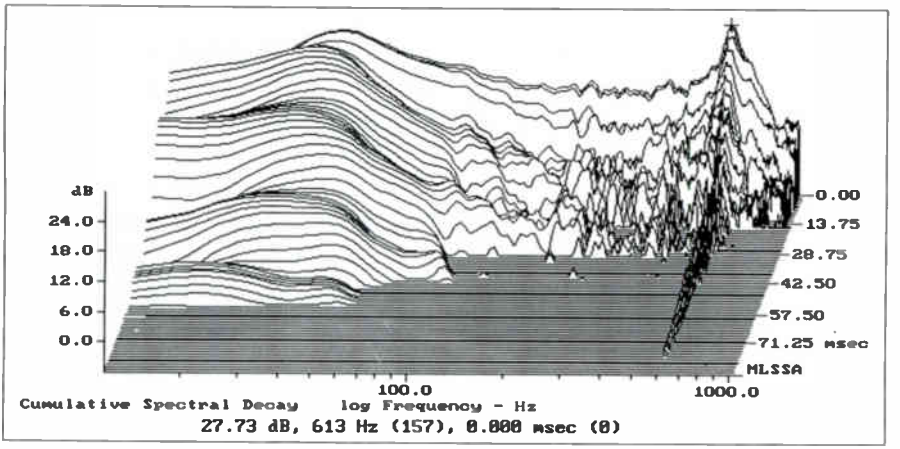


Fig.37 Pinnacle PN8+, cumulative spectral-decay plot of port output, measured in the nearfield.

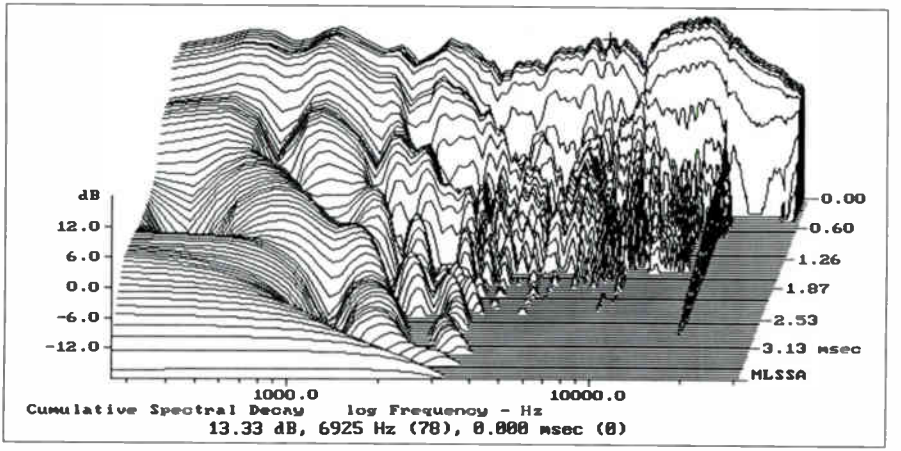


Fig.38 Pinnacle PN8+, cumulative spectral-decay plot

amplifiers or receivers at high sound pressure levels. The impulse response on the tweeter axis (fig.33) is normal for the type of loudspeaker, while the anechoic response averaged across a 30° horizontal window (the right curve in fig.34) shows a generally flat balance broken by peaks and dips throughout the upper midrange and treble. This uneven character will explain the mixed reaction the panel had to the PN8+; note, though, that TJN did find HF transients to take on a "hot" quality, with highs that "made long-term listening difficult." The bass performance is adequate, with a useful response to about 40Hz.

Horizontally, the Pinnacle offers quite even dispersion, as can be seen from fig.35, which plots the *difference* in response as the listener moves to the side, while in the vertical plane (fig.36), the smoothest response appears to be on the woofer axis. Certainly this speaker should not be placed on low stands.

Some listeners commented on a "boxy" nature to this speaker's sound. Its enclosure walls did seem to be generally lively in the lower midrange, which might contribute to this feeling. The port, too, has a large, narrow peak in its output at 613Hz, which can be seen in the cumulative spectral-decay plot of the port's response (fig.37), this ringing for more than 70ms. The full-range cumulative spectral-decay plot for the PN8+ is shown in fig.38. The decay is not very clean across the entire band, apart from the top octave of treble. (The ridge just below 16kHz is due to the computer monitor and should be ignored.) Here again lie some of the reasons for TJN's reservations about the Pin-

nacle's HF performance.

KEF Q60: $599/pair

Description: Although KEF is a British company, their K- and Q-series loudspeakers are manufactured in Richmond, VA. The US facility reportedly uses the same test instrumentation as does the English factory.

The Q60, the least expensive Q loudspeaker, incorporates one 8" Uni-Q MF/HF drive-unit with an 8" bass driver. In KEF's Uni-Q technique, the high-frequency driver is placed in the bass unit's neck. This aligns the acoustic centers of both drivers, resulting in correct phase relationships between drivers, identical path lengths from the drivers to the listener, and puts the two drivers on the same plane. The Uni-Q driver is not to be confused with a coaxial design in which the tweeter is mounted in front of the woofer. Instead, the Uni-Q's driver puts a 1" fluid-cooled polymer-dome tweeter inside the woofer, on the end of its pole-piece. This technique was made possible by the development of a new magnetic alloy, Neodymium Iron Boron, which produces very high field strength from a small structure. The woofer also uses a KEF-patented technique that decouples the magnet from the basket, reportedly resulting in lower coloration.

A fourth-order network divides the frequency spectrum at 2.5kHz. The Q60's reflex bass alignment was optimized for bookshelf placement, an unusual styling feature being the large, profiled port the same size as the Uni-Q driver and below it on the front baffle. Because of the Uni-Q driver's symmetrical dispersion, the Q60 may be placed horizontally or vertically on a shelf. The 0.7-ft³ vented enclosure is made of ¾" high-density particleboard wrapped in black- or light-oak simulated vinyl veneer. Two pairs of gold-plated five-way binding posts are provided for bi-wiring, these normally joined by gold-plated jumpers.

Listening Tests Panel Score: 4.95 (5.33 / 4.57). Scoring solidly above average, the Q60 rose above the disadvantage in which we placed it. Because of setup limitations, it was, like the rest of the contenders, placed well away from nearby walls. KEF does advise that the Q60 is designed to give its best balance quite *close* to a wall.

KEF Q60 loudspeaker

JA was rather bothered on Day One by a forward mid-treble and restricted dynamics. But none of this kept him from awarding the KEFs a good score. He liked them a bit less on Day Two, finding the image pulled somewhat to the sides and the depth restricted. But he continued to find them unaggressive, with good bass articulation. He summarized: "Nicely tuned bass, extension *and* definition, offset by overwide imaging and bright mid-treble and restricted image depth."

CG was fairly positive about the KEFs on Day One. He also objected to the highs, finding them pushed too forward, and thought the sound rather recessed. He did feel that the sound was a bit lightweight, though did not criticize this heavily. But he liked the sound on solo piano, the air on cymbals, and the good dynamics on the drum set. Still, on Day Two his enthusiasm waned as his scores for the KEF slipped. His comments did, however, reflect a general weariness—late on the second day—as he summed up: "John, I no longer have the will to live."

DO, however, really seemed to like the KEFs. He praised their "good pitch definition, good dynamic bloom, natural top, smooth mids," and "fast transients." He thought them "too lean" on the *Oxnard* and noted "not enough punch" on the drum set, but his scores indicated that the KEFs were, overall, his favorite loudspeaker of the day. RL had some criticism for the KEFs, finding them lacking in aliveness and presence on the drum set, rather recessed and polite on the Arnold, and lacking clarity and space

on *Amanda*. But he also found things to praise. On the Kenny Rankin, he noted that the "voice and piano sound *more* like they're in the same space, " but he added that they were "not there yet." He thought that on the *Nevsky* he heard "limitations everywhere," but that they were so "evenly applied that the presentation remains musically balanced."

SM scored the KEFs fairly high in his overall rankings—certainly above average—though he did have some criticism. He found them "laid-back" and lacking in dynamic contrasts, with blurring of individual lines in the orchestral selections. He thought they had a "decent sense of foundation," though with lack of impact. In general, he appeared to find them relaxed and inoffensive, but lacking in transparency. RH thought they glared when loud (on the *Nevsky*), and were a little bright, but he rated the soundstage "good." Overall, he placed them a little below his own average score.

GL liked the sense of depth from the KEFs and the articulation in the *Nevsky* chorus, but felt the low bass to be a bit weak. He liked the KEFs better on the first day, but overall rated them above average.

I felt that the KEFs' midband was rather recessed and the overall sound lacking in dynamics. I liked the high end, overall, and felt the balance to be open and clean, if a shade shy of real precision and focus. On the *Nevsky* I wrote what best sums up my reaction to the KEFs: "Decent space if a *trifle* congested. Reasonable depth. But not gripping in any way. Inoffensive, but not truly convincing." Of course, when I *do* find an inexpensive loudspeaker which is *truly* convincing—especially on large-scale orchestra and chorus—you'll be the first to know.

JA comments on the KEF Q60: I auditioned the KEFs with the same components mentioned in my report on the small Nelson-Reeds. The speakers sat on 24" lead shot'n'-sand-filled Celestion Si stands, spiked through the carpet to the tile-on-concrete floor beneath, which placed my ears almost exactly on the tweeter axis. Though the Q60's grille frame is ingeniously designed to surround the protuberant front baffle, it still adds a raised edge around the top and sides of the drive-unit. I left it off for the auditioning, therefore.

While the KEFs were initially well out in the room, where the WATTs and Puppies usually sit, I quickly moved the speakers back nearer the rear wall due to a rather lean-sounding balance. This boundary reinforcement usefully fleshed out the sound, leaving me free to enjoy the Q60's excellent bass definition and what is a pretty good sense of bass extension for such an inexpensive speaker. The ⅓-octave warble tones on the *Stereophile* Test CD had useful weight down to below 40Hz, with still some response apparent in the 32Hz band. The low frequencies were also well-defined: "fast," to make use of the common oxymoron. Orchestral music was endowed with a reasonably weighty foundation—a "big" sound, say my listening notes—while rock music with a high level of tight midbass information—"Psycho Killer" from Talking Heads' *Stop Making Sense* (Sire 9 25186-2), for instance—was reproduced with an articulate, punchy character. Dynamics also seemed good, the speaker going loud without too much strain. Bob Harley's drum recording on the new *Stereophile* Test CD sounded very "live," for example.

Moving to the other end of the audio band, the highs were generally clean and smooth, though I got a feeling of a rather dull mid-treble. The low treble and upper midrange, however, were more problematical. Though the lower midrange was smooth, there was a lumpiness to the speaker's balance between 500Hz and 2kHz. On my piano recordings, for example, some notes sounded a little depressed, while others jumped forward, with an added "hooty" coloration. This effect was very narrow in range: F at the top of the treble staff and the C a fifth higher (representing frequencies of 698.5Hz and 1046.5Hz, respectively), for example, were affected, but the E and F#, and B and C# to either side, were not. The low treble also sounded rather peaky, which, while adding a sense of brilliance to the speaker's balance (which will initially sound impressive as a result), could become fatiguing. Unlike the Tannoy 609, with its broadly similar drive-unit configuration, the Q60 didn't offer any "cupped-hands" coloration, though changing to the inexpensive amplifier made sibilants more noticeable.

Only on the related subjects of imaging and soundstaging did I feel the Q60s to underperform. Lateral imaging was broad

rather than precise, and image depth seemed restricted. I also seemed to notice a pulling of images to the speaker positions—remember, I hadn't seen the panel results when I auditioned the KEFs in my system. Central images were too diffuse, and images which should be placed to the outside of the speaker positions resolutely stuck to the speaker locations. This was especially noticeable on Larry Archibald's soundstage map on the new Test CD. The Blumlein miking results in good offstage image localization when Larry's image moves to the edges of the Santa Barbara church with speakers that are up to the task. The KEFs weren't. There also seemed a lack of soundstage "air," the essential feeling of spaciousness that helps the end of your room to disappear.

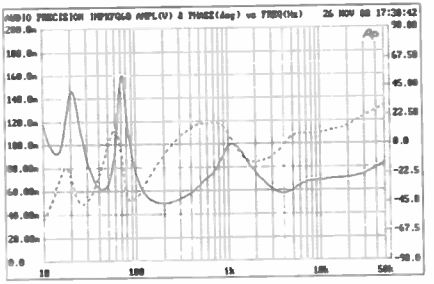


Fig.39 KEF Q60, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.)

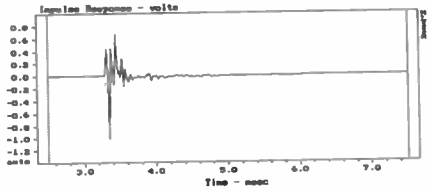


Fig.40 KEF Q60, impulse response on tweeter axis at 44" (5ms time window, 30kHz bandwidth)

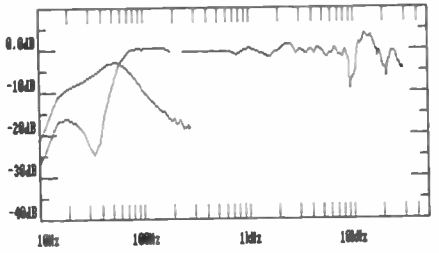


Fig.41 KEF Q60, anechoic response on tweeter axis at 44" averaged across 30° horizontal window and corrected for microphone response, with nearfield woofer and port responses plotted below 200Hz.

Overall, this is fine performance for a speaker at this price point. While the Q60 doesn't do everything right and offers a rather unsubtle, forward-balanced sound overall, it features a well-managed balance of virtues and vices that doesn't fail to be musically communicative.

Measurements: Fig.39 shows the KEF's impedance amplitude and phase, suggesting a speaker that is reasonably easy to drive—the impedance doesn't drop below 5 ohms—and a little overdamped for use near a room boundary (the lower peak is lower in level than the upper one). The port tuning is revealed by the amplitude saddle at 45Hz. Note how the impedance amplitude starts to rise below 15Hz. This reveals the presence of a DC-blocking series capacitor in the woofer signal path, which will result in an ultimate 5th-order subsonic rolloff.

The Q60's impulse response is shown in fig.40. Though the coaxial arrangement of the drive-units might suggest a degree of

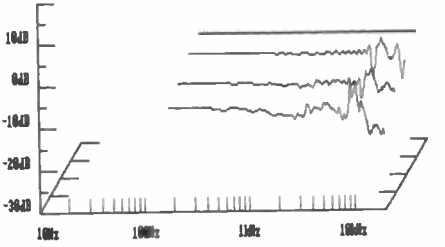


Fig.42 KEF Q60, horizontal response family at 44", normalized to response on tweeter axis, from back to front: reference response; difference 7.5° off-axis; difference 15° off-axis; difference 30° off-axis.

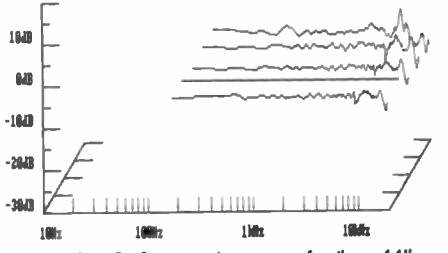


Fig.43 KEF Q60, vertical response family at 44", normalized to response on tweeter axis, from back to front: response difference 7.5° above cabinet top; level with cabinet top; at top of Uni-Q drive-unit; reference response; difference level with base of Uni-Q unit.

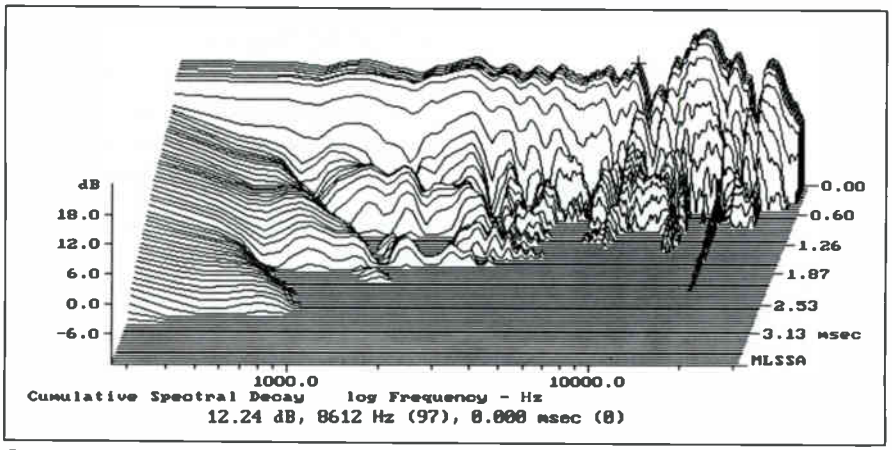


Fig.44 KEF Q60, cumulative spectral-decay plot

time alignment, this curve reveals the tweeter to precede the woofer in time. In the frequency domain, the KEF's anechoic response averaged across a 30° lateral angle (fig.41) is *very* flat, broken only by what must be diffraction-related notches in the tweeter's output at 10kHz and 21kHz, and a similarly caused peak between them. Subjectively quite innocuous, these are a function of the Uni-Q's geometry. In the bass, the port output is centered on 55Hz rather than the 45Hz suggested by the impedance measurement, while the expected minimum in the woofer's output lies at 35Hz, both of these disparities a result of the near-wall alignment chosen by KEF, I assume. The measurements suggest good LF extension, as found in the auditioning, without the heaviness of the Mirage.

The Q60 offers good lateral dispersion, as revealed in fig.42, which shows the *changes* in measured response as the listener moves first 7.5°, then 15°, then 30° off-axis. Apart from the diffraction effects at 10kHz and above changing, and the extreme highs starting to roll off, there is very little change apparent. Vertically, too, the Uni-Q driver offers excellent dispersion (fig.43), meaning that finding the exact listening height will not be too critical a task. The "waterfall" plot of fig.44 indicates a reasonably clean decay, though there is a faint suggestion of liveliness in the low treble that *might* tie in with the subjective brilliance noted in the auditioning. *Might.* The Uni-Q geometry results in the complicated behavior seen above 8.6kHz (the cursor position). This, again, might contribute to the occasionally bright treble note. Again, it might.

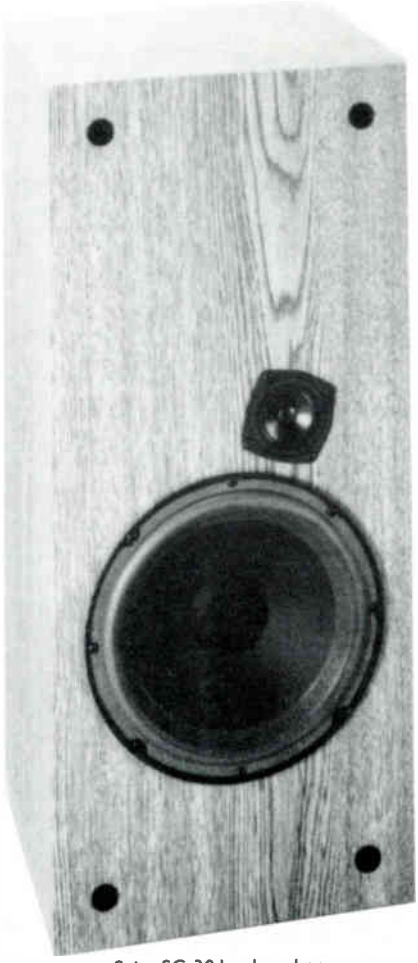
As usual, KEF has produced an inexpensive loudspeaker that measures superbly. It also sounds very good for its price, though it is more untidy in the treble than the measurements suggest.

SPICA SC-30: $399/PAIR

Description: Somewhat larger than many loudspeakers in this group at 1 cubic foot, the SC-30 features an 8" woofer and 1½" polypropylene cone tweeter. The woofer, specially made for the SC-30 by Rockford-Carbonneau, features a "humbucking" magnet geometry for low magnetic leakage. The Peerless-sourced tweeter has excellent HF extension (-3dB at 27kHz). Unusually, the tweeter is mounted directly above the woofer and slightly offset to the right of the center line.

Crossover slopes are third-order, with a 3kHz crossover point. The inductors are wound by Spica, and all capacitors are bypassed with Mylar types. The sealed enclosure is made of ¾" MDF wrapped in black oak-finished vinyl on all sides. No internal bracing is used. A single pair of knurled plastic posts in a terminal cup is recessed in the rear panel. The black grille snaps into four front-panel inserts.

Listening Tests Panel Score: 5.12 (4.94 / 5.30). After the listening sessions had been completed, we learned that the Spica SC-30 was updated in late 1991, the only change being a new woofer. The panel sessions were conducted with the *original* design. Since it



Spica SC-30 loudspeaker

scored so well, we've elected to include the panel results here. RH comments on the new loudspeaker later in the review, discussing any differences he heard between the old and new designs. Spica does claim that the old woofer had a "forward, honky quality," a refreshing bit of candor from a manufacturer. Our panel did note some midrange colorations. Did RH find the new model to be improved? Read on.

JA had mixed feelings about the Spicas. He rated them colored in the midrange on several selections, with a rather "hooty" sound. While on Day One he found the balance a bit overwarm, the higher playback level on Day Two found him liking the rather well-damped, articulate low end. He also commented in several places on a rather forward, coarse (especially at higher levels) treble. But he liked the " 'big' sound that is enjoyable with quite good soundstaging." On Day Two he remarked on the "excellent, well-damped bass offset by a forward treble balance which reduces image depth and is unkind to sound-sources which are in themselves aggressive." While JA clearly did not dislike the Spicas, he rated them behind a number of other contenders.

CG, on the other hand, *did* take a dislike to the Spicas, describing the "bright balance" as "kind of hashy." "Shoot the tweeter-man," he blurted in response to the first orchestral selection on Day One. He was, in fact, disinclined to favorable comment that day, being put off by the top end and disappointed in the bass extension, impact, and a tendency to harden at higher levels. He did like them a little more on the second day, when they were the last speaker auditioned, but not really enough to say that he'd had a change of heart. No Spica-phobe he; CG clearly prefers his Angeluses.

DO was *very* sparing in his comments on the Spicas—though they were in his top-rated group. Remarking on the *Nevsky*, he praised the "convincing bass lines" and "full tonal balance." RL had more to say, but his reaction was mixed. He liked them early on in Day One (the only day he sat in), initially finding them "very easy to listen to." He commented that it "feels like I'm hearing the core of Kenny Rankin's voice rather than its attributes; in that sense, it's more natural." On the drum set he liked the "air, presence, liquidity without overstatement," and found that the "drums sound exciting here." But later, he found that the piano produced a "toy piano/music-box" sound, with "right-hand congestion." On the final selection (*Nevsky*), he felt that the music was "robbed of life," committing "sins of omission, not commission, not so much anything wrong as nothing right." Although his scores on the early music selections brought up his overall score on the Spica to place it among his favorites, clearly RL's feelings about the Spicas were mixed.

Not so GL and RH. GL was less enamored of the Spicas on Day One, where he commented on the midrangey balance—though he remarked favorably on the sense of space in the orchestral selections, and the good bass drum impact on the Arnold. The Spicas

seemed to come to life for him on Day Two, however. "Articulate and lively," he commented. While he felt that piano reproduction was "nothing abrasive" but "nothing to rave about, either," his remark on the final selection was, "Yeah! Gets the blood going."

RH was the most effusive of all about the Spicas. "Tight and punchy bass," he commented on its reproduction of his own drum recording, "best sense of space around drums. Dynamic." He consistently praised the "Good [bass] extension without bloat." On the piano selection he felt that the "hall surrounding the instrument blooms. Very natural and smooth. Not blurred." His summary comments pretty strongly convey his generally positive feelings: "Bass very articulate and tuneful. This is music! Clearly the best of the group. Best soundstage. Best tonal balance. Musical. Least colored bass." Bear in mind that the Spicas were the last loudspeaker auditioned on Day Two—the only day RH was able to participate.

SM also was positively inclined toward the SC-30s. Though he felt the bass definition and impact were not as good as the Snells',[10] he preferred the Spicas' subjectively better bass foundation. His unfavorable comments centered around what he felt to be a lack of transparency, slight midband roughness, and "slightly 'thick' sound" with "lower mid obfuscation. He also commented at one point (RH's drum-set recording) on limited dynamics, though this was counterbalanced to some extent by his observation of an "okay dynamic reach" on the Arnold. But he was positively impressed by the "definable stage" on several selections. Only on the piano selection did he object to the high-frequency response, feeling the notes to have "a slight fuzz halo."

Finally, yours truly had a definitely positive reaction to the Spicas. There were some comment-worthy midrange colorations, largely in the form of some degree of nasality. I commented several times, however, that boxy colorations seemed innocuous. Midrange congestion didn't trouble me. On Day One I found myself generally impressed by the Spica's high-frequency response, commenting only mildly on a trace of brightness at the top end. I remember thinking to myself at the time (remember, I was the only member of the panel who knew the identity of the loudspeaker behind the curtain) that I would not know that this was a cone tweeter unless someone told me. But on the second day, at a slightly higher level, I found the Spicas' high-frequency response a bit rougher. "HF lacks some refinement and is a bit uneven," and "highs a trifle prominent and slightly dry and crisp," I said in commenting on the two orchestral selections. But I found the Spicas' bass to be generally "tight and punchy," with only some midbass heaviness (primarily on JGH's voice) to upset the positive verdict. I liked the Spicas' sense of depth and spaciousness, generally finding the overall sound tight, dynamic, and punchy. That slightly "unrefined" quality of the SC-30's top octaves—especially at the higher playback level of the second day—didn't keep me from scoring it highly overall.

While not all panel members were equally taken (or taken at all, in one or two cases) with the Spicas' sound, the speakers generally garnered favorable scores in both sessions—scores which put them solidly at the top of the rankings of the new loudspeakers auditioned here for the first time.

RH comments on the Spica SC-30: I auditioned the SC-30s mounted on a pair of 24″ lead shot–filled Celestion stands. They wound up 59″ from the rear wall and 39″ from the side walls, measured to the center of the baffle. Toeing them in so that I was directly on-axis produced the best imaging and tonal balance. The 36″ listening axis put my ears right at the woofer's top edge. According to designer John Bau, the system is phase-aligned when the listener's ears are on the bottom of the cabinet. This position can be approximated by turning the SC-30 upside down or by the listener sitting on the floor (I did both).

Associated components included VTL 225W Deluxe monoblocks and Boulder 500AE power amplifiers, and an Audio Research LS2 line-stage preamplifier. The digital front end was a Mark Levinson No.30 or Kinergetics KCD-55 Ultra, both driven by a Theta Data through the ST-type optical link. Analog source was a modified Well-Tempered Turntable and Arm, fitted with an AudioQuest AQ 7000 cartridge, driving a Vendetta Research SCP2B phono preamp.

10 The Spicas were auditioned third on Day One, after the Snells (open audition) and the KEFs.

Loudspeaker cables were 8′ runs of AudioQuest Sterling, and interconnects were Expressive Technologies IC-1, AudioQuest Diamond and Lapis, and Straight Wire Maestro.

I couldn't believe that the excellent sound produced by the SC-30 in my listening room was that of one of the loudspeakers auditioned during the blind testing; I didn't remember hearing anything this good. But as JA commented during the blind listening sessions, "This type of test is much better at telling you what's wrong with a loudspeaker rather than what's right with it." His aphorism certainly proved true for the SC-30.

The SC-30 was well-balanced and smooth through the upper mids and treble. In fact, the treble was nicely detailed, open, and extended—surprising for a $399 loudspeaker and for the SC-30's inexpensive cone tweeter. There was a bit of roughness in the lower treble, manifested as a graininess in the upper registers of some instruments—saxophone and violin in particular. The lower treble was also a little forward, accompanied by the impression of the lower mids being somewhat lightweight. This made some instruments sound forward and lacking in warmth and body. Overall, however, the SC-30's mid and treble reproductions were surprisingly good for a $399 loudspeaker—my criticisms must be taken in this price context.

The SC-30's weakness was the bass reproduction: it tended to be somewhat forward, peaky, and boxy, though well extended. Left-hand piano lines were reproduced with some notes moving forward in the presentation and taking on a different tonal character. Low-pitched toms had more than a trace of bloat, tubbiness, and slowness. These characteristics detracted from the SC-30's otherwise excellent performance and got in the way of the music.

However, after I'd finished auditioning the SC-30s (but before Spica read a preprint of this review), I received word that the woofer had been replaced in current production. This could be just what the SC-30s needed to elevate their performance above what I'd already considered a superb loudspeaker for the money.

The new woofer certainly improved the bass performance. The honk and forwardness at certain frequencies was reduced, resulting in a less colored rendering. The bass was also tighter, more articulate, and had greater extension. The excess midbass energy seemed to be moved down in frequency, where it added to the feeling of depth and extension instead of making the loudspeaker sound boxy. Although there seemed to be less bass with the new woofer, it was probably because the new version's sins were those of omission, rather than the first version's sins of commission. The new version also sounded brighter, probably because they were fresh out of the box and not as fully broken in as the first pair.

Imaging and soundstaging were surprisingly good for a $399 pair of loudspeakers. Although the SC-30s didn't "disappear" as do some minimonitors, they nevertheless threw a credible soundstage. In particular, the SC-30s had a good sense of depth, with a clear impression of some instruments existing behind others. Many inexpensive loudspeakers tend to fuse instrumental outlines at the front of the soundstage. Not the SC-30s—they presented a real sense of size, space, and three-dimensionality.

Image specificity varied greatly with listening axis. When I slid down from the listening chair to the floor, the soundstage became more focused, with a more palpable center channel. In the normal listening axis, the soundstage was fairly well-defined but lacked pinpoint precision.

Dynamics were excellent. There was a punch and solidity to the bass that served the music well, especially music in which rhythm and pace are vital—Stevie Ray Vaughan's excellent *The Sky is Crying* (Epic EK 47390), for example.

Incidentally, the SC-30's performance was greatly improved by capping each speaker with an Acoustic Ballast from Wise Enterprises.[11] These are bags of black Cordura nylon filled with 25 pounds of damping material. The Acoustic Ballasts reportedly dissipate cabinet resonances. With them in place, the bass was tighter and faster, soundstage focus improved, and the presentation was more coherent.

In summary, the SC-30's best attributes were its overall musical balance, sweet yet detailed treble, and open soundstage. On the down side, the bass still had some bloat, and

11 Wise Enterprises can be reached at 2025 Peters Colony, Carrollton, TX. Tel: (214) 492-8702.

the roughness in one region of the lower treble bothered me with some music. Having said that, I must reiterate my high regard for the SC-30; it sounds far better than any $399 loudspeaker has a right to. I greatly enjoyed my time with it, something that can be said about very few loudspeakers in this price range.

The bottom line? The Spica SC-30 is a steal at $399. Of all the inexpensive loudspeakers I've auditioned, the SC-30 gets my vote for best sound for the money.

Measurements: The measurements shown here are for the earlier model used in the panel auditions. Measurements for the latest version will appear in a later issue. The Spica's impedance, shown in fig.45, reveals a classic sealed box tuned to 55Hz. Easy for inexpensive amplifiers to drive, the SC-30's impedance doesn't drop below 7 ohms. Note the wrinkle in the amplitude trace at 300Hz. This will be due to a cabinet resonant mode of some kind that would probably add a somewhat boxy coloration.

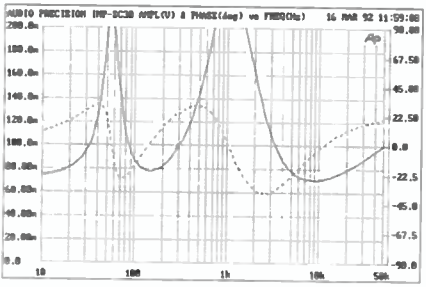


Fig.45 Spica SC-30, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.)

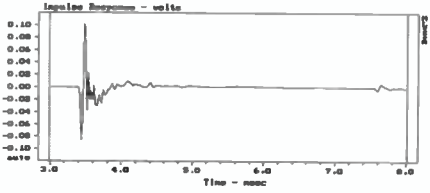


Fig.46 Spica SC-30, impulse response on woofer axis at 44" (5ms time window, 30kHz bandwidth)

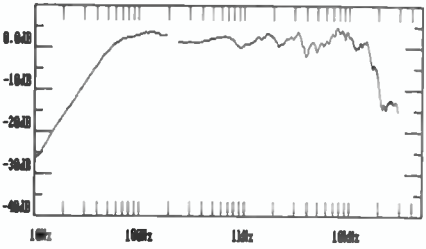


Fig.47 Spica SC-30, anechoic response on tweeter axis at 44" averaged across 30° horizontal window and corrected for microphone response, with nearfield woofer response plotted below 200Hz.

Fig.46 shows the SC-30's impulse response on the woofer axis. (This was the closest I got to what I now understand to be the speaker's design axis, level with the base of the cabinet. Now *there*'s a nonintuitive axis for you!) The ripple at the far right of the graph is the reflection of the speaker's sound from the ceiling. Note, however, some much earlier reflections around the 4ms mark. These are probably from the edges of the large baffle.

In the frequency domain, averaged across a 30° window on the tweeter axis (fig.47), the SC-30 offers a surprisingly even response trend throughout the midrange and treble considering that it uses a *cone* tweeter. Some

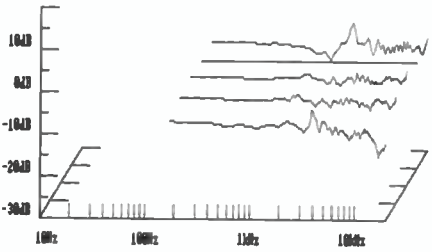


Fig.48 Spica SC-30, horizontal response family at 44", normalized to response on tweeter axis, from back to front: difference 15° off-axis on woofer side of baffle; reference response; difference 7.5° off-axis on tweeter side of baffle; difference 15° off-axis; difference 30° off-axis.

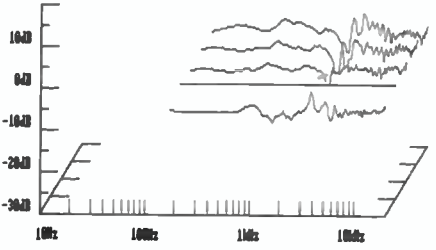


Fig.49 Spica SC-30, vertical response family at 44", normalized to response on tweeter axis, from back to front: response difference 7.5° above cabinet top; level with cabinet top; midway between cabinet top and tweeter; reference response; difference on woofer axis.

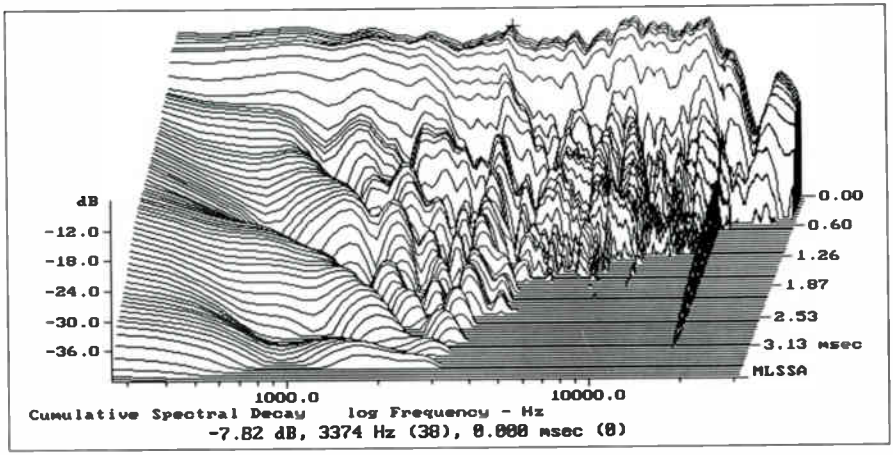


Fig.50 Spica SC-30, cumulative spectral-decay plot

measured raggedness in the lower treble will correlate with RH's slight dissatisfaction with the sound in this region. Note also the slightly early rolloff in the top octave. In the bass, the in-room measurement suggested a degree of underdamping to the alignment which bothered some listeners. The LF extension is excellent for such an inexpensive speaker, however, with a -6dB point at 43Hz, just above the lowest note of the 4-string orchestral double bass and Fender bass guitar.

Again surprisingly for a speaker with a cone tweeter, the SC-30's horizontal dispersion is excellent. The sound gets a little peaky in the mid-treble off-axis on the side away from the tweeter (fig.48, rearmost trace), but on the tweeter side of the baffle, all that really happens as the listener moves to the side (up to 30°) is that the extreme treble drops a little in level. In the vertical plane (fig.49, which shows the difference in response from that on the tweeter axis) the response gets more ragged as the listener moves up the baffle, confirming that the optimum listening axis is level with or below the woofer.

The cumulative spectral-decay plot (fig.50) shows some general liveliness in the low and mid treble, as commented on in the auditioning. What is probably a woofer breakup or cone termination mode can be seen at the cursor position (3.4kHz), which might add a little nasality to the sound, but the plot is actually quite clean for an inexpensive loudspeaker with—here I go again—a *cone* tweeter.

It's been said that any fool can produce a high-end loudspeaker given an unlimited budget. Once again, however, John Bau (who I believe is currently taking a sabbatical from audio nerdism to get a degree in psychology) has shown that he can get excellent measured results from what others might consider unpromising parts. This is the mark

Reviewer individual statistics

REVIEWER	TOTAL OVERALL SCORES**	TOP 4* (In Order)	BOTTOM*
CG	3.31	Snell Pinnacle a/d/s Dahlia	Nelson-Reed
DO	3.86	KEF Nelson-Reed Spica Mirage	Tannoy Snell (tie)
GL	5.04	Mirage Snell Spica Pinnacle	Tannoy
JA	5.05	Pinnacle Mirage Dahlia Snell	Nelson-Reed
RH	4.71	Spica Pinnacle a/d/s KEF	Nelson-Reed
RL	4.65	Snell Spica a/d/s KEF	Tannoy
SM	4.41	Snell Spica KEF Mirage	Nelson-Reed
TJN	4.70	Dahlia Spica Pinnacle Snell	Nelson-Reed

*Total overall score for all loudspeakers, both days: 4.48
**Average of both days for CG, GL, JA, TJN (except day #2 only for Dahlia)
Day #1 only for RL, SM
Day #2 only for DO, RH
(Note: The open session scores for the Snell KII were *not* included in any averages).

Table 3.

of the high-end designer with true talent.

INDIVIDUAL PREFERENCES & CONCLUSIONS

Table 3 shows the top four choices of all the panel members, their least favored loudspeakers, and the overall average scores each gave. While there was certainly no consensus, some definite trends emerged. The Tannoys and Nelson-Reeds were the least favored (although DO also did not much like the Snell). The Spica, KEF, Pinnacle, and Mirage —the top four finishers in the overall ratings (discounting the Snells, which were not specifically under review here)—all rated highly on the "most favored" lists. The Spicas found their way onto six of the eight top four lists, the Snells tied this figure. But the Spica, recall, was more consistent in the scoring from Day One to Day Two. The Pinnacle, also a consistent performer, made it onto five lists. Though the KEF outscored it overall, the Q60 only made it onto four lists, though it was fairly consistent in its positive marks. The Mirage also showed up on four lists.

By its nature, a listening panel looks for things a product does wrong. Here we again stacked some modestly priced loudspeakers up against our memories of both the real thing and the Class A, B, and C loudspeakers most of us use in our regular listening. If the panel's criticisms seem at times severe, they should be viewed in that light. None of these loudspeakers will transport you to the concert hall without a lot of imagination on your part. The best of them will make that leap considerably easier. $

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*Stereophile, Oct. 91, Vol. 14 No.10

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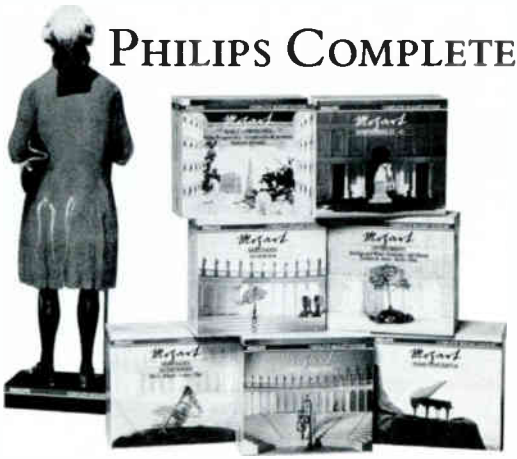

PHILIPS COMPLETE MOZART EDITION

PART I: INSTRUMENTAL MUSIC

We will probably never know the number of issues this Mozart bicentennial has clarified, but one question has been decided by the celebration: How many CDs would *all* of Mozart's music fill? The answer has been provided by Philips's *Complete Mozart Edition*, which comprises 182 discs. And "complete" is in no way hyperbolic. As an accompanying promotional booklet puts it, this Edition contains "all known authentic original and complete works" as well as "as many authentic fragments or movements that can be brought to the possibility of performance." Included, too, is "a selection of Mozart's arrangements of works by other composers." Absent from this category, however, are his four adaptations of Handel oratorios, the most notable of which is, of course, *Messiah*.

Even in a phonographic age that has come to take complete editions for granted, this Philips project dwarfs all past integral releases. In the main, it is a triumph of taste and technology. Much of this prevailing taste, I suspect, reflects the influence of Erik Smith, who presided over some of the recordings in this Edition and has made major decisions about its contents. The son of conductor Hans Schmidt-Isserstedt, Smith is himself a first-class musician who, when producing recordings for Pierre Monteux, had been urged by the Frenchman to pursue a conducting career. Smith has also demonstrated his grasp of the Mozartean idiom in his completion of some of the fragments in this Edition. He thus has brought to this project a depth of background that still remains all too rare among recording executives.

This is not to say that this Edition is scholarly in a narrow or pedantic sense. Although some period-instrument performances are included, most are on modern instruments. Indeed, it probably could not have been any other way, simply because to make the project viable, Philips has had to draw upon recordings that have graced its catalog for

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some time, the earliest among them being a quarter-century old. But no monaural material has been included. Purely on musical grounds, this is not always a virtue. Neville Marriner's more-than-respectable stereo account of the magnificent "Posthorn" Serenade, for instance, is no match for the van Beinum/Concertgebouw mono version of 1955. The same applies to the monaural collaboration of Arthur Grumiaux and Clara Haskil in the Violin Sonatas, which boast slightly more animation than Grumiaux and Walter Klein could muster in a later traversal.

But these are minor quibbles. What astonishes is the generally high technical and musical level that is sustained. The remastering of older recordings has, in general, been accomplished with great skill, and it may be assumed, where no comment about sound is made in the ensuing discussion, that it is more than adequate. Obviously, with so many different artists involved, the musical level of the performances is bound to vary. Certainly there are offerings of better-known

THE COMPLETE MOZART ON PHILIPS—PART I

Vol.1: ***Early Symphonies***
Sir Neville Marriner, Academy of St. Martin in the Fields
Philips 422 501-2 (6 CDs only). ADD, DDD. TT: 6:38:35

Vol.2: ***Symphonies 21–41***
Sir Neville Mariner, Academy of St. Martin in the Fields
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Vol.3: ***Serenades for Orchestra***
Sir Neville Marriner, Academy of St. Martin in the Fields
Philips 422 503-2 (7 CDs only). DDD. TT: 6:43:45

Vol.4: ***Divertimenti for Strings & Winds***
Sir Neville Marriner, Academy of St. Martin in the Fields' Chamber Ensemble
Philips 422 504-2 (5 CDs only). DDD. TT: 4:30:55

Vol.5: ***Serenades & Divertimenti for Winds***
Sir Neville Marriner, Academy of St. Martin in the Fields Wind Ensemble; Edo De Waart, Netherlands Wind Ensemble; Holliger Winds Ensemble
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Vol.6: ***Dances & Marches***
Willi Boskovsky, Vienna Mozart Ensemble
Philips 422 506-2 (6 CDs only). AAD. TT: 6:43:46

Vol.7: ***Piano Concertos***
Alfred Brendel, Ingrid Haebler, piano; Sir Neville Marriner, Academy of St. Martin in the Fields; Ton Koopman, Amsterdam Baroque Orchestra
Philips 422 507-2 (12 CDs only). ADD, DDD. TT: 12:35:13

Vol.8: ***Violin Concertos***
Henryk Szeryng, Iona Brown, violin; Sir Alexander Gibson, New Philharmonia Orchestra
Philips 422 508-2 (4 CDs only). ADD, DDD. TT: 4:24:48

Vol.9: ***Wind Concertos***
Various soloists, Sir Neville Marriner, Academy of St. Martin in the Fields
Philips 422 509-2 (5 CDs only). DDD, ADD. TT: 4:23:12

Vol.10: ***Quintets, Quartets, Movements & Fragments***
Grumiaux Trio; Academy of St. Martin in the Fields' Chamber Ensemble
Philips 422 510-2 (3 CDs only). ADD, DDD. TT: 3:00:49

Vol.11: ***String Quintets***
Arthur Grumiaux, Arpad Gérecz, Georges Janzer, Max Lesueur, Eva Czako
Philips 422 511-2 (3 CDs only). ADD. TT: 2:49:47

Vol.12: ***String Quartets***
Quartetto Italiano
Philips 422 512-2 (8 CDs only). ADD. TT: 7:54:26

Vol.13: ***String Trios & Duos***
Grumiaux Trio; Academy of St. Martin in the Fields' Chamber Ensemble
Philips 422 513-2 (2 CDs only). ADD, DDD. TT: 2:13:40

Vol.14: ***Piano Quintets, Quartets, & Trios***
Beaux Arts Trio, Alfred Brendel, Stephen Bishop-Kovacevich, *et al*
Philips 422 514-2 (5 CDs only). DDD, ADD. TT: 4:33:36

Vol.15: ***Violin Sonatas***
Arthur Grumiaux, Walter Klein, *et al*
Philips 422 515-2 (7 CDs only). ADD, DDD. TT: 7:46:16

Vol.16: ***Music for Two Pianos, Piano Duets***
Ingrid Haebler, Ludwig Hoffman, Jörg Demus, Paul Badura-Skoda, piano
Philips 422 516-2 (2 CDs only). ADD. TT: 2:26:57

Vol.17: ***Piano Sonatas***
Mitsuko Uchida, piano
Philips 422 517-2 (5 CDs only). DDD. TT: 5:25:10

Vol.18: ***Piano Variations, Rondos, Miscellaneous Keyboard Pieces***
Ingrid Haebler, Mitsuko Uchida, Ton Koopman, piano
Philips 422 518-2 (5 CDs only). ADD, DDD. TT: 4:34:15

Vol.21: ***Organ Sonatas & Solos***
Daniel Chorzempa, organ; Helmut Winschermann, Deutsche Bachsolisten
Philips 422 521-2 (2 CDs only). ADD. TT: 115:01

Vol.25: ***Theater & Ballet Music***
Sir Neville Marriner, Academy of St. Martin in the Fields; Bernhard Klee, Staatskapelle Berlin; David Zinman, Netherlands Chamber Orchestra
Philips 422 525-2 (2 CDs only). ADD, DDD. TT: 2:19:15

fare here that are not competitive with other available accounts. Remember, though, that each of the 45 volumes in this Edition—all of which are sold at mid-price—is available individually. It is consequently possible for the collector, should he so desire, to assemble a complete Mozart of his own using this Philips package as a resource for filling gaps as well as for, where fitting, acquiring a preferred interpretation.

The question then remains whether or not any collector would be wise to buy this entire Edition. Unless very well-heeled or fixated on having a uniform set of 45 boxes, an individual would be wiser to pick selectively among the offerings, especially in the light of Philips—foolishly, I believe—having opted for *not* making the entire package available at a reduced price (at least in the US). After all, nearly everything included in this Edition comprises recycled material.

These recyclings, to be sure, have been updated, even when they have had previous CD release. Notes by distinguished specialists grace booklets that are more elaborate and informative than what typifies most CD productions, sometimes yielding significant improvement over what was included in previous releases. (Occasionally, as noted below, some first-class notes from the past have been scrapped.) Then, too, an Edition of this kind has incalculable value to institutions, bringing all of Mozart's work together in a neat package. Surely major public and university libraries as well as music schools would do well to have this compendium available as a prime reference source and teaching tool.


PHILIPS CLASSICS PRODUCTIONS

Philips Classics producer Erik Smith, whose taste prevailed

Beyond question, this Edition teaches many things; for example, the remarkable precocity of the child Mozart and the ways in which it developed. Listen, to cite but one instance, to the opening of Symphony 16 and hear how it anticipates Symphony 18. Or be reminded of Mozart's growing daring, his melodic inventiveness, harmonic innovations, and the unflagging artistry with which some of his boldest strokes are woven into the musical fabric. Indeed, had Mozart been a painter—and he is said to have had talent as a visual artist—he probably would have succeeded in combining the most garish colors in a way that would make them seem utterly apt for Brooks Brothers' window.

Taken as a whole, then, this Edition stands as a cogent homage to a composer who may well have written the most perfect music in the history of Western civilization. The discussion of individual volumes that follows is confined (with one brief exception) to the composer's instrumental music, his vocal output to be the subject of a forthcoming "Building a Library" article.

Vol.1: ***The Early Symphonies.*** With the exception of three short works recorded digitally in 1989, everything in this set comprises analog productions from the early '70s. Given the conventional numbering of the Mozart symphonies, it appears that he composed a total of 41. But some of the juvenilia featured here brings that total to 53. Marriner is superb in this repertory: unaffected, spirited, and employing an ensemble that is at once precise, crisp in its attacks, and aptly transparent and lean. Doubtless nearly everything here is more important for its suggestion of the master to come and for revealing how the young Mozart absorbed the rich musical culture of his time than for its own intrinsic merit. All the same, these symphonies are often charming, and have unques-

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tionable historical significance.

Vol.2: ***Symphonies 21–41.*** In many respects, these performances from the '70s score over those Marriner has duplicated in his currently ongoing traversal of this repertory for EMI. Philips's sound is closer, cleaner, and more intimate, with a resulting clarification of texture that such intimacy promotes, and Marriner was less inclined to Interpret in these earlier efforts, a prime case in point occurring in the opening movement of the "Haffner." There is not a bad performance in this set, though some succeed better than others. The two major disappointments are 40 and 38. In the former Marriner opts for Mozart's earlier version without clarinets, thereby depriving the work of color and expressivity; in the latter he fails to suggest all of the nervous intensity implicit in the work, which—more, perhaps, than any of Mozart's other orchestral pieces—suggests the direction his music might have taken had he lived longer. On balance, though, this is one of the better boxes in the Edition. Neal Zaslow's annotations in this and the preceding volume are welcome bonuses.

Vol.3: ***Orchestral Serenades.*** Mozart, doubtless affected by the forces available to him, responded to commissions for a "serenade" quite differently, sometimes producing music of no great consequence, other times—as in the "Haffner" and "Posthorn"—composing major masterpieces boasting tightly knit symphonic cores. Marriner sustains a high level throughout this repertory, but in the two elaborate works just cited does not match the best phonographic efforts, my preference among available recordings of each remaining with Szell (Sony) for the "Posthorn" and Böhm (DG) for the "Haffner." But taken as a whole, this is another distinguished set. The sound suffers occasionally from boomy bass.

Vol.4: ***Divertimenti for Strings & Horns.*** Another distinguished set. Marriner's readings may at times seem a bit too cool and straightforward, but they are stylish and, more often than not, aptly animated. The *Musical Joke* emerges with all its hilarity as a model of how *not* to compose, and other highlights include a suave, graceful K.287 and a light, transparent K.334, both works benefiting from some exceptionally fine horn playing.

Vol.5: ***Serenades & Divertimenti for Winds.*** Marriner is superb in the great K.361 Serenade, and the Netherland Wind Ensemble proves wonderfully light and fluent in some of the earlier works. The Holliger Wind Ensemble, however, disappoints in the two other masterpieces in this set, the Serenades K.375 and 388, both of which require greater thrust and tension. The latter, by the way, is the work Mozart revised as the C-Minor String Quintet, K.406. All of the other pieces in this volume, though of lesser interest, yet contain passages that, typical of Mozart at his best, shock and surprise.

Vol.6: ***Dances & Marches.*** Drawn from recordings produced between 1964 and '66 for English Decca, this potpourri of minuets, contredances, marches, and the like amazes for the variety Mozart could wring from such a markedly restricted format. Taken in relatively short hearings, this repertory will yield considerable pleasure, and having all of it under one cover underscores the imagination and wit central to the Mozartean style. Boskovsky, one-time concertmaster of the Vienna Philharmonic, leads graceful, relaxed performances. The digital updating of what must have been, at least in some instances, pre-Dolby sound is a model of what can be achieved in good CD transfers.

Vol.7: ***Piano Concertos.*** With the exception of the first four concertos (juvenilia played by Ingrid Haebler), everything here features Brendel and Marriner. The pianist has, of course, gained distinction as a kind of modern Artur Schnabel as a result of having turned frequently to Mozart, Beethoven, and Schubert. But his Mozart is often greatly removed from Schnabel's, being less tonally alluring and more restricted in its range of rhythmic inflection and tempo. Nevertheless, Brendel's prevailing verve and musicality make this traversal as attractive as any currently available. The major disappointment here is an (all-digital) cool, understated account of 25, perhaps the most towering masterpiece in a set filled with towering masterpieces, and the work Sir Donald Tovey cited as the paradigm of the Classical concerto. One has only to hear the versions of Rudolf Serkin (Sony), Schiff (London), and Fleisher (CBS) to discover how much more dramatic and expressive the music can be than it is with Brendel. But elsewhere Brendel is magnificent, capturing the festive pomp of 22, the sparkle, humor, and grandeur of

21, the demonic agitation of 20, and the lyric grace of 23, to cite but some examples. In short, this is a package well worth considering for individual purchase. This set, incidentally, retains an essay by Brendel included in a previous Philips box of the concertos, but replaces a pointed survey of the music by Michael Steinberg with a longer, more factually detailed essay by William Kinderman.

Vol.8: *Violin Concertos.* If not a failure, this set does not match the standards set by many of the others in this Edition. Szerying's execution is doubtless polished and often quite beautiful, but its beauty is somehow abstract and seems to miss some of the music's intrinsic youthfulness and *brio*. And Gibson is not quite so incisive a conductor as Marriner. Similarly, the great Sinfonia Concertante, K.364, with Brown and Imai as soloists, lacks the tension and intensity of the glorious Szell-led version recently issued by Sony. What is of greatest interest in this set are reconstructions of two fragments—a concerto for violin and piano, and a one-movement Sinfonia Concertante for violin and viola, the former hinting at the later Piano Concertos 19 and 26.

Vol.9: *Wind Concertos.* Here is a splendid set, highlighted by a gorgeous account of the undervalued Flute and Harp Concerto (marred only by Reinecke's jarringly unstylish cadenza), lively accounts of the two flute concertos featuring Irena Grafenauer, virtuosic readings by Peter Damm of the four horn concertos, and Karl Leister's performance of the great Clarinet Concerto, as good as any in the current catalog that I have heard. An additional attraction of this set is its inclusion of two versions of the Sinfonia Concertante, K.297b, one familiar, the other a reconstruction by Robert Levin catalyzed by the long-standing doubtful authenticity of the better-known version. Throughout, Marriner offers fine support.

Vol.10: *Quartets & Quintets for Strings & Winds.* The prize here is a poised, at times even haunting, performance by Anthony Pay of one of Mozart's sublime works, the Clarinet Quintet. Everything else in this set—the flute quartets, the Horn Quintet, and the Oboe Quartet—is of a considerably lesser order. Valuable, however, are the movements and fragments for chamber ensemble, a rejected finale for the String Quintet K.174 revealing that even the younger Mozart exercised considerable self-criticism.

Vol.11: *String Quartets.* Aside from the early K.174, the music in this set comprises some of Mozart's most glorious works, and the playing of the group led, in effect, by Grumiaux is at once stylish, elegant, animated, tonally suave, and technically adroit. Thus this is another set well worth acquiring individually. Deryck Cooke's brief notes for the original CD reissue of these performances are here replaced by four individual essays, one for each of the four languages featured throughout the annotations for this Edition, the one in English being a pointed essay by Alec Hyatt King.

Vol.12: *String Quartets.* Recorded between 1966 and '73, this is one set among those devoted to instrumental music that suffers on technical grounds. The remastering throughout is at too high a level, and the sound is generally hard and coarse, a shortcoming that neutralizes whatever tonal polish the Quartetto Italiano may have mustered. In the main, these are lively, beautifully phrased readings, with the 13 early works tossed off with considerable panache. The more familiar and considerably more interesting later scores also fare well in the main, but at times, as in the first movement of K.458, one misses some of the music's incipient wit and joy. Unless one is absolutely bound to completeness, better versions of the mature works can be had by picking from among those recorded by the Smetana, Juilliard, Talich, and Emerson Quartets.

Vol.13: *Strings & Duos.* The highlight of this set is the gorgeous account from the Grumiaux Trio of the Divertimento K.563, which contains music on the level of Mozart's finest quartets and quintets. And the transfer of this 1967 recording is far more musical in sound than what has been accorded the Quartetto Italiano in Vol.12.

Vol.14: *Piano Quintets, Quartets, & Trios.* Nearly everything in this volume comprises major fare, but the prize among all the works may well be the still relatively unfamiliar Quintet K.452 for winds and piano, one of Mozart's most imaginative creations, performed here with a mixture of grace, vibrance, and poise by Brendel *et al.* In the trios and quartets, the Beaux Arts Trio offers suave, polished, buoyant readings. An interesting inclusion is the reconstruction of a Trio K.442 derived from three surviving fragments. Throughout, the sound is uncommonly fine:

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Vol.15: ***Violin Sonatas.*** The main attractions of this set, which contains considerable juvenilia, are the 15 mature sonatas performed by Grumiaux and Klein. Perhaps their readings (as already suggested) lack some of the intensity that Grumiaux and Haskil brought to this repertory in monaural Philips recordings, but this does not detract from the virtues of these later accounts, which, among other things, offer prime testimony to Grumiaux's seeming inability to produce anything save a beautiful sound. A revealing inclusion here is the Sonata, K.54 ("For Beginners"), a work that uses some of the material present in the familiar K.545 Piano Sonata, also for beginners. All of the recordings, produced between 1974 and '91, benefit from exceptionally clear engineering.

Vol.16: ***Piano Duets.*** One of the lesser achievements in this project, this set offers readings that, in the main, are adequate but a bit too polite and correct, lacking the subtlety and verve that the music demands. Particularly deficient in this regard is the rather neutral account of the great Sonata K.448.

Vol.17: ***Piano Sonatas.*** Here is a traversal (recorded between 1983 and '87) that has sparked both high praise and marked skepticism. Uchida's approach to this repertory is to de-prettify it, to draw many inferences from the printed page, and, at times, to pull out all emotional stops. In short, her readings are greatly removed from the cool, detached classicism, say, of Gieseking, often to the point of taking risks that some may feel spill over into mannerism. But others might feel (as I often do) that the pianist brings out the music's rich expressivity. Listen, for instance, to the *Sturm und Drang* intensity in her projection of the A-Minor Sonata, K.310; or to the humor she suggests in K.570. In fact, the only major disappointment in this set may be her stolid, rather heavy-handed way with K.533/494. A worthy alternative to this cycle, incidentally, is a recently reissued Sony box of four CDs featuring Lili Krauss in equally expressive, slightly faster, more rhythmically inflected readings. Note, however, that it is not quite as complete as Uchida's, omitting, for example, K.533/494.

Vol.18: ***Piano Variations, Rondos, & Miscellaneous Pieces.*** This set mixes juvenilia, lesser works from later periods, and a few masterpieces such as the Rondo K.511. Even the lesser works, though, fascinate for what they reveal of the composer, especially the way in which he used stock figurations in the variation form, one of those formulas anticipating a portion of the great set of variations that opens the familiar Piano Sonata K.331. If the performances are not always the most imaginative, they remain more than merely adequate.

Vol.21: ***Organ Sonatas & Solos.*** Here are 17 pieces for organ and orchestra—each comprising a single sonata-form movement having an especially terse development section—that Mozart composed for Church use. None is a masterpiece, and one senses that the composer was simply responding to a demand created by the custom of using instrumental music in the liturgy. Far more arresting are the few works for solo organ, originally written for clockwork organ, where the harmonic daring is especially striking. The 20-year-old recordings sound as if they were produced yesterday.

Vol.25: ***Theater & Ballet Music.*** The two gems of this small set are the ballet, *Les petits riens*, and the incidental music for the Gebler play, *Thamos King of Egypt*. The former is made up of a delightful overture and eleven brief, often sharply contrasted numbers that bespeak Mozart's melodic fluency and awareness of the pragmatic needs of dance, all of this superbly conveyed by Marriner and his able musicians. The incidental music features some fine choral writing and anticipations of *The Magic Flute* and *La Clemenza di Tito*. Under Klee's direction, it is dramatic and aptly ceremonial. Note, too, in the ballet music for *Idomeneo* (also in this set) lies the seed for the finale of the great Piano Concerto 25.

Coming away from this astonishing output of instrumental music, one is shaken by the many facets of Mozart's genius: his ability to make the most seemingly outlandish move seem absolutely right and in keeping with Classical balance and good taste; his command of sensuous melody and of sharp contrasts in tonality that make him the aesthetic father of Schubert; and, perhaps most of all, his power to shake the universe with what seems but a flick of the wrist. Mozart viewed himself, "without impiety," as he put it, as "a fellow of superior talent." Even in such apt self-analysis, he remained the consummate master of understatement. **S**

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Q: What do these three conductors (l–r: Zubin Mehta, Giuseppe Sinopoli, Kent Nagano) have in common? (A: Turn to p.199.)

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Telarc CD-80295 (CD only, as if we had to tell you that). Robert Woods, Elaine Martone, prods.; Jack Renner, Michael Bishop, engs. DDD (as if we had to tell you that, too). TT: 61:39

When confronted with the transcendent *ouevre* of the late P.D.Q. Bach, this reviewer frequently finds himself at a loss for words, but here faced with what is not only the crowning glory of P.D.Q.'s opus, but an effective satire of contemporary "classical" FM radio as well, I had no choice but to cry for help. Fortunately, aid was forthcoming from a number of luminaries of the critical arena whom you will no doubt recognize, but who were unaccountably unwilling to have their names associated with the last and perhaps least son of the great Johann Sebastian. Notwithstanding, I offer my heartfelt thanks to these unnamed contributors.

"This recording and performance achieved a respectable score of 13 on my open-ended scale, failing, however, to best the current reference, *Barry Manilow's Greatest Hits*, which attained the hitherto unprecedented rating of 26.5. . ."

"While listening to this disc with some of my colleagues in the Rahway Symphony, we noted the clever use of the low reeds for comic effect. Since I myself play the contra-tromboon, I was reminded of the time we were playing a concert up in Hoople, and it was really cold up there, being Northern South Dakota, and—wait a minute, you mean record reviewers *don't* get paid by the word? Forget it. . ."

"So the other day I'm over at Harry Hyperbole's along with Peter Planetoid and the Brass Monkey. We were listening to the Adcom B&K Jadis or whatever, driving Quad Spica Vandersteen WATTs or whatever, when my favorite running gag Jars shows up. Now the system isn't exactly working, mind you, but we're getting close, and Jars pulls out this P.D.Q. Bach thing. So while Pete and Harry get hernias substituting another five-grand amp for the one with only one working channel, I treat the disc with a green pen and some Rinso Blue on a powder puff. When we're all connected, I put

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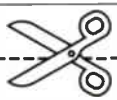

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the CD in the Jitterbug transport (with the platinum power-cord mod) running through the Numbers Game A/D, and hit Play. You know what happens then? The whole obscenely priced mess *blows up!* Isn't that neat? Well, if we ever get the system back together, I'll let you know how it sounds. But while I was reading the really clever liner notes, I got this great idea. I'm organizing a trip to Northern South Dakota—it's as cold as Russia, the economy's as bad, and . . ."

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"I said *turn it up*! I can't hear a damn thing. Listen, if it wasn't for me, you young punks wouldn't *have* a magazine, so give me some *gain* already. That's better. Well, I thought this was supposed to be *funny.* All this 'P.D.Q.' seems to have done is steal the playlist from a *real* classical FM station. 'Nothing written after 1912.' 'No minor keys.' 'Every ninth piece has to be by Grieg.' 'We play the music you don't mind hearing—wall to wall Pachelbel.' So where's the *joke*? Sounds good, though, the part I can hear . . ."

"The desert. The stars like a thousand points of cold, immaculate light. Suddenly, incandescent hyperbolae of sound, arcing into the ebon depths of Space, like messengers speaking with the voice of the Blessed Bob: 'Fire this guy, as soon as his fax is open'. . ." **—Les Berkley, *et al***

BARTÓK: String Quartets 1 & 3; 44 Duos, Vol.3
Endellion String Quartet
Virgin VC 7 90774-2 (CD only). Mike Hatch, eng.; Andrew Keener, prod. DDD. TT: 54:57

The Endellion give a more anguished reading of Bartók's Quartet 1 than I'm used to, and while their constant striving throughout the work makes it hang together rather better than is often the case, I can't say I warmed to their approach.

The through-composed Quartet 3, however, needs just this kind of treatment, the Endellion's technical prowess assuring a confident rhythmic thrust and vitality. But again, I didn't feel the players could relax, thus failing to introduce an appropriate measure of light and shade where necessary, particularly in those evocative passages of "night-music."

The inclusion of almost 11 minutes of duo playing after the intensity of Quartet 3 came as a great shock to the system and, to my mind, represents very poor program planning. This music is inevitably thinner and less emotionally demanding—it would have served better as an introduction to the disc. To make things worse, the over-reverberant acoustic provides far too loose a focus for such an intimate ensemble. Also, given Virgin's record for frequently filling discs with over 70 minutes of music, just under 55 seems rather meager. **—Barbara Jahn**

BERNSTEIN: Symphony 2 ("The Age of Anxiety"), *Fancy Free, Candide Overture*
Andrew Litton, Bournemouth Symphony; Jeffrey Kahane, piano ("Anxiety")
Virgin VC 7 91433-2 (CD only). Mike Hatch, Nicholas Parker, engs.; Andrew Keener, prod. DDD. TT: 66:32

For those of you who saw this recording trashed by Arvid Ashby in the January/February 1992 issue of *The American Record Guide*, here's a second opinion. This is a fully digital CD superdisc. It deserves, at the very least, nominations in performance and production categories by such prestigious concerns as Grammy and *Gramophone.* It hasn't happened. Virgin Classics is an industry underdog,[1] and whereas Litton and Kahane have their followings, neither operates on the sort of high-profile, heavy-duty industrial level that appeals to the makers and shakers of public fame.

In a note included with the liner material, Litton unabashedly describes his youthful adulation for Leonard Bernstein, dating from attendance at NYP Young People's Concerts starting at age nine. Fortunately for all of us, not least of all Litton himself, he seems to have outgrown this adulation, channeling it into productive admiration for the pieces themselves. Otherwise, he may have fallen into the trap of attempting to clone any number of emotionally extravagant aspects of the numerous recordings Bernstein himself made of these works from 1944 through 1990.

Admire Bernstein though he should and might, Litton is clearly a different type of musician, typical of his generation, who performs less from some divine inspiration than from practical, intelligent motivation. He does so honestly, usually without fussiness, and with a certain intensity that keeps pedestrianism at bay. Having a snappy and responsive orchestra like the Bournemouth Symphony is no liability.

1 Maybe things will change now that Richard Branson has sold Virgin to Thorn-EMI for almost $1 billion. —JA

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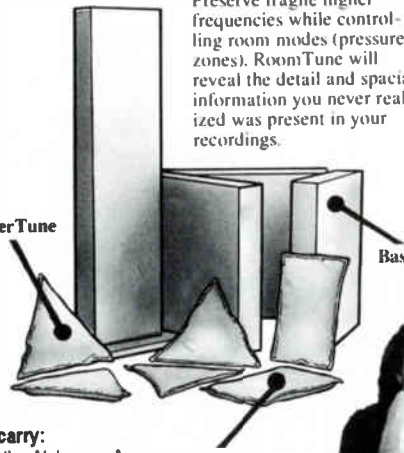

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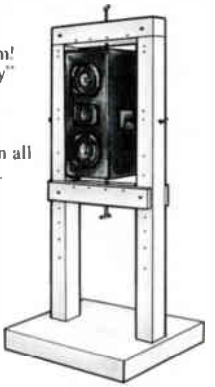

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For his recording of this crypto-piano concerto in the guise of a literary symphony based on W. H. Auden's verse novel of post-WWII *ennui*, Litton finds an ideal collaborator in pianist Jeffrey Kahane. He easily outplays both of Lukas Foss's recordings with Bernstein, most especially their reunion recording with the Israel Philharmonic for DG in 1977, which, in its uptight caution, is one of LB's least successful recordings. Bernstein's 1965 NYP recording with Philippe Entrement, recently reissued by Sony, is enough to give one pause in recommending this new recording as a one-and-only. While Bernstein delves into the piece as if someone else had written it, Entrement waxes brilliant and mysterious as the mood requires, and the remastered sound is nothing short of miraculous, quite super in its own right. Litton/Kahane, on the other hand, show how well this music thrives with a more cerebral approach. And cerebral here doesn't mean nerdy; it means cerebral *energy*.

For the Jerome Robbins ballet, *Fancy Free*, Litton takes on no less than four composer-led recordings, including the 1944 abridged 10" 78 set for American Decca, recently reissued by MCA. We may dismiss the Slatkin/St. Louis *Fancy Free* on Angel as a nice try. Bernstein's most recent *Fancy Free*, a 1978 DG with the Israel Philharmonic, the diametric opposite of the unfortunate "Anxiety" with these forces, bristles with jazzy show-band dazzle. Even so, Litton and his people take them on handily. Whereas Bernstein compromised his IPO *Fancy* with some incredibly self-indulgent and poorly judged vocalization, Litton begins his performance with the original recording of "Big Stuff" sung by Billie Holiday with a five-piece combo, from the very Decca 78 as heard in the MCA reissue, and as heard on the bar jukebox before the three sailors "explode on stage" in theatrical performances of the ballet.

As a filler, the *Candide* overture features cleaner ensemble than Bernstein's own NYP recording, and it's breezy, exuberant, and irrelevant. For *Candide*, all you need is Bernstein's own complete recording, the live one on DG video (VHS and Laser).

Sonically, we may add this to other Keener/Hatch recordings we've admired, and place it on the shelves of equipment designers, critics, manufacturers, and retailers, who need to hear and demonstrate with brilliantly played orchestral material which sounds like *real* music in a *real* space. **—Richard Schneider**

COPLAND: ***Tender Land* Suite, *Three Latin-American Sketches*, *The Red Pony***
James Sedares, Phoenix Symphony
Koch International Classics 3-7092-2 H1 (CD only). Michael Fine, prod., eng.; Andy R. Seagle, Chari Christi, Jeffrey Behr, engs. DDD. TT: 58:00

For their recording debut, James Sedares and the Phoenix Symphony have wisely chosen three relatively under-recorded works of Copland. Although theirs is the fourth recording of *Red Pony*, the composer's own recording with the LSO, on Sony's *Copland Collection—Orchestral Works (1948–1971)*, is likely to be the only competitor for some time to come.

The Red Pony, a 1949 Lewis Milestone film which starred Myrna Loy and Robert Mitchum, was based on a short novel for younger readers by John Steinbeck. It was the ideal family film: kids could relate to it, and grownups could enjoy it without embarrassment. Look for it at your video store. But this recording does nothing to change my view that, despite some very beautiful and touching moments, the near half-hour suite is too long, and covers too much ground already covered by Copland in other pieces.

The 20-minute Suite from *Tender Land* is symphonic in scope and style, and as admirable and enjoyable on its own terms as Strauss's Suite from *Rosenkavalier*. Drawn from an opera which made its recording debut on Virgin just over a year ago, the suite has been recorded only once before, in 1961 by Copland and the Boston Symphony on RCA, available on an RCA Gold Seal CD.

Against this very formidable competition, Sedares/PS demonstrate, to all who can hear, the wealth of available talent in this country to staff regional orchestras at every professional level many times over, and then some. On one had we're told that classical music is a dying art, and that some of our orchestras are in danger of folding. Yet here we have a Southwestern orchestra which has assumed full-time professional operation and appears to have a conductor and the players to fulfill its aims. The orchestra personnel list in the liner notes also includes administrative staff, box office, development, etc.—practically everyone but the ushers. One cannot dismiss this display as provincial puffery in view of the musical results obtained.

The best thing one could say about the audio production is that it calls no attention to itself, merely revealing the performance as taking place in a somewhat generic but perfectly adequate acoustic site.

If I were to raise a musical criticism, it would be in the area of showmanship, an especially important factor in putting *Red Pony* across. There is an abundance of shading, nuance, and "chamber music" in Sedares's approach, perhaps a reaction to the pummeling and overemphasis we've received at the hands of the Soltis and Rostropoviches of this world, not to mention the obsequious sincerities of the Giulinis, or the sanctifications and leaden *tenutos*-for-days of the Karajans. Sedares/PS's most convincing gestures are the quiet ones. The most

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successful performance overall is of the work most lightly scored, the *Three Latin American Sketches*.

Although the ability and good taste are there, I sense a cautious reluctance to release the full power of the orchestra at those key moments in any symphonic work at which everyone just *lets go*. That's the primary difference between these performances and Copland's own. Even so, this recording has many qualities to shake the "majors" off their laurels. Add a bit more showmanship, and we may have to redefine just what a major orchestra is and where it may be found.

—Richard Schneider

ELGAR: ***Enigma Variations, Falstaff***
Charles Dutoit, Orchestre Symphonique de Montreal
London 430 241-2 (CD only). DDD. TT: 63:24
ELGAR: ***Marches***
Pomp & Circumstance Marches, Coronation March, Empire March, Imperial March, Triumphal March from *Caractacus*, Concert Overture—*Cockaigne*
Yehudi Menuhin, Royal Philharmonic
Virgin VC7 91175-2 (CD only). Mark Vigars, eng.; John H. West, prod. DDD. TT: 68:06

This is not a version of the *Enigma Variations* that I could warm to. Dutoit seems to be scratching the surface here, with the music's more profound emotions only hinted at. I can't say the orchestra sounds especially committed either—semiquaver runs in the second variation are very slack at the edges, and there is no wit at all in the depiction of G. R. Sinclair's dog falling into the river Wye in Variation 11. Unfortunately, the symphonic study *Falstaff* receives a similarly lightweight reading that failed to hold my attention, even though that work too is driven by a strong program element that shouldn't be too difficult to tap.

Turning to Menuhin's performances, it becomes obvious that Dutoit just hasn't managed to find that elusive ingredient that makes Elgar Elgar. Menuhin's association with the composer and his music began in his early teens, when he premiered the Violin Concerto after (admittedly minimal) tutelage from Elgar himself, and this shows in his handling of just about every other work by the composer. The *Pomp & Circumstance Marches* are heroic but never stuffy, Menuhin keeping the pressure on with boisterous speeds and vigorous, lifting rhythms. Even the lengthy *Coronation March* is buoyant and purposeful and, though I would criticize the slightly ill-judged tempo at the opening of the *Imperial March* and some less-than-neat playing in *Cockaigne*, these are all performances to which I would return. Essentially, Menuhin understands and balances to perfection the mercurial changes of mood in Elgar, and that goes some way toward explaining Dutoit's (and many others') lack of success.

—Barbara Jahn

GOUNOD: ***Faust***
Richard Leech, Faust; Cheryl Studer, Marguerite; José van Dam, Mefistofeles; Thomas Hampson, Valentin; Martine Mahé, Sibel; Nadine Denize, Marthe; French Army Chorus, Orchestra & Chorus of the Capitol of Toulouse, Michel Plasson
EMI CDS 7 54228 2 (3 CDs only). Alain Lanceron, prod. DDD. TT: 3:33:40

This is the first new, complete *Faust* we've had in quite a while, and it's just about the best of what's available today. Indeed, in a couple of areas, it's golden-age.

Richard Leech is a fabulous young tenor with a free top, a ringing tone, and brains. He gets inside the character totally—this Faust is weary in Act I, anticipatory in Act II, passionate and credible in the Garden Scene, and remorseful in Act V—all the while singing like a champ. Not since Gedda undertook the role on disc decades ago has it made such sense, and the fact that Leech occasionally sounds like Fritz Wunderlich doesn't hurt either.

Cheryl Studer's Marguerite is no less good. I'm still amazed, like everyone else, by her versatility—she has recorded Salome, Gutrune, the Empress (in *Die Frau ohne Schatten*), the Queen of the Night, and now this, all successfully. (She's not as convincing on-stage for some reason, but that need not concern us here.) Here she's vulnerable and touching, and she sings gorgeously. We actually root for her and Faust as a couple—pity it doesn't work out that way.

Van Dam's Mefistofeles is topnotch as well, despite a bit of drying-out of his voice. He never plays to the gallery; his devil is all the more menacing for being understated. Thomas Hampson—he of the sensuous pose and matinee-idol countenance—is a bit light for some of Valentin's more passionate utterances. His French is the least idiomatic of the majors, but he sings worthily and is ultimately credible. The others in the cast draw sharp characters in excellent French.

The orchestra is quite good, if not world-class, but the chorus is, and the addition of the French Army Chorus (it's nice that they have nothing else to do) in the big Act IV number adds panache and vitality. So what's the problem? Well, it's Michel Plasson's leadership. Gounod's music tends to sound like spun sugar; unless a conductor decides to bring out the drama beneath the treacle, the whole affair can become soft-edged and lose its gusto. That happens here too often. Granted, there's still bite in the Kermesse scene, and when Mefistofeles is around we get some real flash, but the tender moments are slowed down too much and come perilously close to sounding sickly. You'll be able to imagine what the recording would be like with real conductorial spark.

The sound is up to EMI's best, which is to

say superb: realistic, ideally balanced, and full without any doo-dads, fake distancing, or echo effects. What to do? Buy this—despite my reservations about Plasson, the singers are so good that I wholeheartedly recommend this *Faust* anyway; it's the best around. Incidentally, the reason for the long playing time is the inclusion of the ballet music and four numbers the composer later deleted. These, appearing as appendices at the end of the third disc, are interesting to hear. —**Robert Levine**

MONTEVERDI: *Salve Regina*, Motets for 1, 2, & 3 voices
Gerard Lesne, Josep Benet, Josep Cabre, Brigitte Lesne, Il Seminario Musicale & Tragicomedia
Virgin VC 7 91145-2 (CD only). Michel Bernard, prod.; Françoise Eckert, eng. DDD. TT: 64:43

Recorded in the Église du Liban, Paris, these performances radiate a quasi-ecclesiastical aura of sound which proves entirely apt for a mixed bag of motets ranging from liturgical works such as the *Salve Regina* to a lovely "moral canzonetta," based on an Italian poem of unknown authorship (but probably Angelo Grillo), *Spuntava il dì*.

The voices, appearing in various combinations of one, two, or three, are accompanied by groups of instruments chosen from a total of eight, including violin, cello, violone, viola da gamba, and as harmony instruments a chamber organ, theorbo, archlute, lirone (a large lyre), and a baroque harp. The range of sounds is subtle and appealing, and those using gold-plated cables will derive the maximum of enjoyment from this CD. Due to the small vocal ensemble, the texts are always audible, and for those who like to follow the texts a booklet is provided with originals and translations.

Six motets from an early publication were written when Monteverdi was only 15 years old, but they already project a strong personality. There are two motets from the 1610 *Vespers*, but texts have been omitted and the vocal lines transcribed for instruments alone. If this procedure seems a little odd, it is justified by the nature of the program, which definitely needs a break from vocal sounds. The remaining pieces, from anthologies published during the composer's Venetian years (1613–1643), represent a wide range of subjects and styles.

Balance between voices and instruments is satisfactory, and the performances are mostly of a high standard. Now and then the singers mistake three-voice homophonic passages as invitations to hurry, but this should not be so. A well-nigh perfect performance of *Spuntava il dì* suffers in this way. Note that the sixth title should read *Veni sponsa Christi*, and that it is in honor of St. Helen. (No.2—*Fuge anima mea*—is in honor of St. John the Baptist.) Listeners with the necessary technical facilities may wish to dub this motet into the recently issued *Vespers of St. John the Baptist* (Philips CD 422 074-2), deleting Bazzino's rather clumsy dialogue.

—**Denis Stevens**

STRAUSS: *Salome*
Eva Martón, soprano (Salome); Heinz Zednik, tenor (Herod); Brigitte Fassbaender, mezzo (Herodias); Bernd Weikl, baritone (Jochanaan); Keith Lewis, tenor (Narraboth); Gabriele Schreckenbach, contralto (Page); others; Berlin Philharmonic, Zubin Mehta
Sony Classical S2K 46717 (2 CDs only). Steven Epstein, Grace K. Row, prods.; Kevin Boutote, eng. DDD. TT: 99:01

STRAUSS: *Salome*
Cheryl Studer, soprano (Salome); Horst Heistermann, tenor (Herod); Leonie Rysanek, mezzo (Herodias); Bryn Terfel, baritone (Jochanaan); Clemens Bieber, tenor (Narraboth); Marianne Rorholm, contralto (Page); others; Berlin German Opera Orchestra, Giuseppe Sinopoli
DG 431 810-2 (2 CDs only). Wolfgang Stengel, Pal Christian Moe, prods.; Klaus Hiemann, eng. DDD. TT: 101:41

STRAUSS: *Salome*
Karen Huffstodt, soprano (Salome); Jean Dupouy, tenor (Herod); Hélène Jossoud, mezzo (Herodias); José Van Dam, baritone (Jochanaan); Jean-Luc Viala, tenor (Narraboth); Hélène Perraguin, contralto (Page); others; Lyon Opera Orchestra, Kent Nagano
Virgin Classics VCD 791477-2 (2 CDs only). Arend Prohmann, prod.; Katharine Copisarow, eng. DDD. TT: 104:50

The premiere of Strauss's *Salome* in Dresden on December 9, 1905 startled the musical world with its story of depravity, intensified by Strauss's sensuous music. The story of the youthful princess's lust for John the Baptist, her performing the "Dance of the Seven Veils" and then demanding the Baptist's head as a reward, was too much for audiences—and censors—of the time, although soon afterward *Salome* was accepted as the true masterpiece it is.

Salome is scored for a large orchestra, including 50 strings, 6 horns, 4 each of trumpets and trombones, and 2 harps. A harmonium is used briefly, particularly in the opening scene to set an eerie mood, and there is a brief organ part, used primarily in the final scene. According to Strauss, the title role should be sung by "a 16-year-old princess with the voice of an Isolde," an unlikely combination indeed. The role is extremely demanding: there are no high Cs, but a plethora of Bs and B-flats, with a consistently high tessitura, as well as two G-flats below middle C.

Three new complete recordings of *Salome* have been issued. Sony's offers Eva Martón in the title role, DG's features Cheryl Studer, and Virgin presents the initial recording of Strauss's original French adaptation, with Karen Huffstodt. For various reasons, none of these is ideal, though each has its strong points.

Eva Martón's *Salome* is remarkable for its sheer volume, but little else. Her wobble covers

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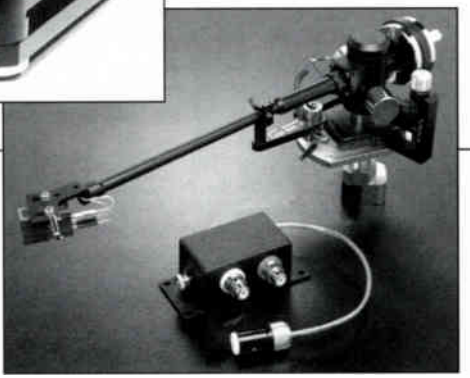

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perhaps five notes, two above and two below the one written. Her sound is unpleasant, and subtlety is not her forte; her bulldozer approach hardly begins to suggest a voluptuous teenage princess. Birgit Nilsson has proven that a true dramatic soprano can, indeed, be sensational as *Salome*; Martón is not in her class. Weikl's Jochanaan and Brigitte Fassbaender's Herodias are superb, but Heinz Zednik's Herod is unsteady and bleating. The real glory of this recording is the magnificent Berlin Philharmonic under Mehta's incandescent direction; the spectacular engineering lets us hear much orchestral detail with vivid impact; climaxes are stunning. Cheryl Studer characterizes *Salome* effectively, with a youthful sound, an interpretation of great insight, and careful, controlled phrasing—she has plenty of power for the final scene. As in the Sony version, the Jochanaan (Bryn Terfel) and Herodias (Leonie Rysanek, herself in earlier years a superb Salome) are fine, but Horst Heistermann's uncontrolled Herod is disappointing. Sinopoli's direction is always assured, but he underplays the score's drama; the big orchestral interludes as Jochanaan re-enters the cistern, and preceding the final scene, are modest when compared with Mehta's explosions of sound. DG's engineering is satisfactory, although lacking the impact of the Sony recording.

Strauss prepared the French version of *Salome* shortly after the German premiere. This required some changes in the music to adapt Oscar Wilde's original play, and it was premiered in 1907, but then disappeared. Subsequent French performances were a translation of the German text without the subtle changes Strauss incorporated. It wasn't until 1989 that Strauss's original French version was rediscovered, reconstructed, and performed, and this is the basis for Virgin Classic's set. It's fascinating to hear this, and would be more so if the performance were better. Karen Huffstodt's voice is severely taxed; she sounds raw and edgy, and frequently is off-pitch. The supporting cast is adequate, but Nagano and his Lyon forces are not nearly as effective as they were in their award-winning recording of Prokofiev's *Love for Three Oranges*. The orchestra sounds undersized, brass is unimpressive, and Nagano's leisurely approach misses the score's excitement and drama. Virgin Classics' engineering favors the voices, with an overall diaphanous orchestral sound. Those interested in hearing *Salome*, or at least part of it, in French, might wish to investigate Marjorie Lawrence's magnificent 1934 recording of the final scene (Preiser 89011).

When Strauss heard the voice of Bulgarian soprano Ljuba Welitsch, he suggested to her that she sing *Salome*. She studied the role with him and sang it for the first time on the composer's 80th birthday (June 11, 1944), with Strauss conducting (does a recording exist anywhere?). Since that time Welitsch has been considered by many to be the definitive *Salome*, with the youthful sound, interpretive insight, characterization, and power necessary to cut through Strauss's heavy orchestra. It is one of the many tragedies of the recording industry that Columbia did not record a complete *Salome* in 1949 when she made her unforgettable American debut at the Met (as did conductor Fritz Reiner); at least they did record the final scene, a recording that has yet to appear on CD. However, a Melodram 2-CD set offers the Welitsch/Reiner 1949 broadcast in reasonably good sound (voices close, orchestra distant). For a contribution of $150 the Met will supply the Welitsch/Reiner 1952 broadcast (a three-LP set coupled with the Varnay/Reiner *Elektra*), but this is not nearly as vocally assured a performance. Also available is a stunning performance of the final scene from a 1944 Austrian broadcast which, in spite of its dated sound, is perhaps the finest performance ever recorded of this music. Those who know the final scene may be surprised to hear a change in the vocal line during the climax. On the last syllable of "Jochanaan," Welitsch sings D# instead of descending to G#; this is not an error; it is the only alternate note in the entire score. In all later recorded performances Welitsch sings the G#.

There are other recordings of the final scene. Martón's earlier effort with Andrew Davis and the Toronto Symphony is no better than her new complete recording. Leontyne Price's Boston Symphony/Leinsdorf version on RCA is impressive, but she is miscast. Inge Borkh's 1955 recording with Reiner and the Chicago Symphony is excellent; her voice is not quite right for the part, but she is an intelligent musician and can sing the notes. This recording is worth owning just for Reiner's accompaniment and the spectacular playing of the Chicago Symphony.

Which of the three new complete recordings to own? It's unfortunate that Studer didn't sing the title role in the Mehta recording. Of the three, surely the one to have is the DG; I find Martón's Salome impossible to enjoy. The French version is an intriguing novelty, with a commendable booklet of profuse notes, fascinating illustrations, and many musical samples.

Only two complete earlier recordings remain in the catalog (the Behrends/Karajan EMI/Angel set was recently deleted); both are commendable. Birgit Nilsson's brilliant performance, with Solti and the Vienna Philharmonic in top form, is magnificent in its way. Montserrat Caballé's recording, with Leinsdorf and the London Symphony, is convincing and sensitively sung, and has the advantage of being in

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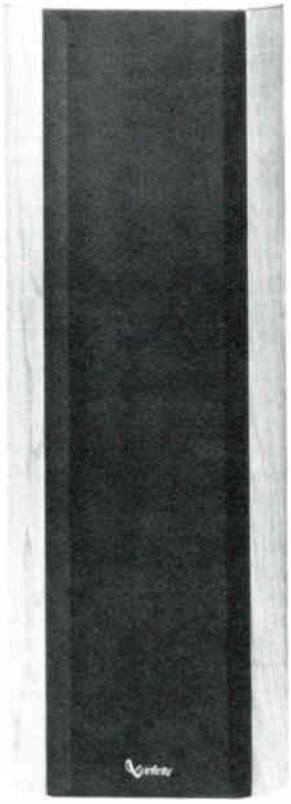

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—Robert E. Benson

WEBER: *Der Freischütz*
Karita Mattila, Agathe; Francisco Araiza, Max; Eva Lind, Ännchen; Ekkehard Wlaschiha, Kaspar; others; Rundfunkchor Leipzig, Staatskapelle Dresden, Sir Colin Davis
Philips 426 319-2 (2 CDs only). Mike Bremner, prod. DDD. TT: 2:16:24

Recordings of *Der Freischütz* don't grow on trees the way, say, recordings of *Aïda* do, so this new one is most welcome. Despite some reservations about individual performances, it's a great success.

The leadership of Sir Colin Davis is the major selling point. *Freischütz* is a conductor's opera, and Davis makes it his own. He doesn't buy into the "early-German-opera-oompah" approach at all, and that's fine with me. He sees it as a dark tale, filled with doom and foreboding, in which superstition and evil almost win over the rational. Just listen to the waltz (No.3 in the score; CD 1, band 7). His tempi are lead-footed and heavy—this is not a jolly moment. In fact, there are no jolly moments in this reading. Even the hermit's pronouncements and the closing chorus are moral lessons rather than a day at the beach. Try it; it makes sense.

Soprano Karita Mattila, a lovely singer, brings great feeling to Agathe's music. There are moments, however, when the voice simply doesn't respond. Similarly, Francisco Araiza's Max is vocally a bit too light, but he infuses whatever he does with passion and concern, and makes it work. Casting him rather than the usual heavy tenor is another of Davis's coups—this Max is not a ferocious hero; he's in trouble too. Eva Lind is nowhere as Ännchen; her voice gets lost in the music, and it takes more personality than she has to bring this character to life. Ekkehard Wlaschiha is a suitably slimy Kaspar, singing with real depth and darkness, and the rest of the cast is excellent. The Dresden and Leipzig forces are superb, giving just the right weight to each phrase and helping Davis with his vision.

The recording is wonderfully atmospheric, especially in the Wolf's Glen Scene, where the echo effects are stunning. Furtwängler's reading (on Hunt) is, to my ears, the most successful on disc, but this one comes close, and if you demand superb sound, then obviously, this is your choice.

—Robert Levine

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Gunther Schuller, New England Ragtime Ensemble
GM 3018 (CD only). John Newton, eng.; Gunther Schuller, prod. DDD. TT: 59:33

One of Angel Records' great hits some 19 years ago was *The Red Back Book* of Scott Joplin, a disc performed by The New England Conservatory Ragtime Ensemble conducted by Gunther Schuller and now transferred to CD. Joplin is included as well in Schuller's most recent collection, featuring a similar ensemble but consisting of different personnel. A glance at the above listing reveals an unusually wide range of pieces, a history of the rag if you will, which begins at the beginning of the 20th century and even includes six recent examples, such as the witty "12-Note Rag" of 1977 by Kenneth Laufer, and Schuller's own 1986 "Sandpoint Rag" with its featured horn solo. Schuller has also been responsible for a number of the arrangements, several of them—James Reese Europe's pieces and those of Jelly Roll Morton—having been transcribed from early recordings. The whole program is extremely entertaining, controlled in performance yet perky, and above all highly virtuosic, with splendid solos. Imaging is superb, the soundstage most effectively conveyed, and clarity is exceptional.

—Igor Kipnis

BERLIOZ: *Symphonie fantastique*
With: *Roman Carnival Overture*, Three Pieces from *Le Damnation de Faust*
Sir John Barbirolli, Hallé Orchestra
EMI CDM 763762 2 (CD only). Robert Auger, John Mosely, Christopher Parker, engs.; Michael J. Dutton, remastering eng.; John Snashall, Douglas Terry, Christopher Bishop, prods. ADD. TT: 74:54
DEBUSSY: *La mer*
RAVEL: *Daphnis et Chloé*, Suite 2; *La Valse*; *Ma Mére l'oye* Suite
Sir John Barbirolli, Hallé Orchestra (& Chorus in *Daphnis*)
EMI CDM 763763 2 (CD only). Robert Auger, John Mosely, engs.; Michael J. Dutton, remastering eng.; John Snashall, Douglas Terry, prods. ADD. TT: 67:35
DVORÁK: Symphonies 7 & 9 ("New World")
Sir John Barbirolli, Hallé Orchestra
EMI CDM 763774 2 (CD only). Robert Auger, Robert Fine, engs.; Michael J. Dutton, remastering eng.; Harold Lawrence, Douglas Terry, prods. ADD. TT: 75:53
ELGAR: Symphony 1, *Sea Pictures*
Sir John Barbirolli, Hallé Orchestra; Kirstin Meyer, mezzo-soprano (*Pictures*)
Intaglio INCD 701-1 (CD only). ADD. TT: 77:42

As Alan Sanders points out in his annotations to the three EMI Barbirolli reissues, the British conductor's reputation has undergone considerable reassessment since his death in 1970. The general consensus now is that he belongs among the great romantic interpreters of the century, one whose passionate involvement in

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CELESTION

his music making is never in doubt. Listening to the gorgeous Dvorák Seventh of 1957, the vividness of the Debussy/Ravel program, and the exciting and characterful Berlioz (the *Roman Carnival* of 1966 is a first-time issue), one must be thankful to EMI for resurrecting on CD what has been largely unavailable since the deletions of the previous incarnations on Vanguard and Mercury. In two cases, the original Pye recordings of 1958 had never been issued in the US: the lovely mono-only *Mother Goose Suite* and the extraordinarily fine three *Damnation of Faust* excerpts. (In my enthusiasm, I wound up playing Barbirolli's swaggering *Rakoczy March* no less than four times in a row.) EMI's processing, often impressive, reveals a fairly open-sounding orchestra, one that could at times almost be described as tonally luscious, except for the loudest, climactic moments, when constriction and stridency of upper strings and brasses are decidedly uncomfortable to the ear.

While the EMI issues represent the Barbirolli of the late '50s, the time of his great accomplishments, when he had single-handedly brought the Hallé Orchestra, badly declined in the war years, to a level of excellence nearly matching that of the best British orchestras, the remaining disc by the new Italian firm, Intaglio, contains the conductor's very last recorded concert. By July 24, 1970, Barbirolli had already suffered a number of collapses brought on by a heart condition, including one in rehearsal the day before this performance. He was determined, however, to die in harness, and if there was evidence of physical frailties, it is not present in this intensely moving concert, his second to last and one which preceded his death by only five days. Though the *Sea Pictures* are appropriately passionate and surging, the Janet Baker commercial EMI recording with Barbirolli is vocally preferable. The large-scale Elgar Symphony 1, however, is a superb performance by any standard, and the reproduction is remarkably vivid and detailed. **—Igor Kipnis**

JAZZ

BILL EVANS: ***Blue in Green***
Bill Evans, piano; Eddie Gomez, bass; Marty Morell, drums
Milestone MCD-9185-2 (CD only). Helen Keane, prod.; Paul LaCroix, eng. ADD. TT: 53:10

Bill Evans is frequently thought of as a delicate romantic. No wonder. He specialized in brooding ballads; he had an exquisite touch; his rounded tones and distinct voicings were instantly recognizable; he looked introverted; he hung over the keyboard, his forehead almost touching the keys, curled up like a wet fern at daybreak. Yet Evans was a powerful as well as a lyrical pianist. His best improvisations gather force, unfurling, after a typically warm theme statement, into billowing phrases with broadening rhythms.

This new disc, from a concert in Hull, Canada recorded for a 1974 Canadian Broadcasting Corporation transmission, is valuable because it found Evans performing pieces he'd recorded elsewhere, but which he plays here ebulliently. Evidently playing at all that night was a challenge, as the Canadian night was cold—Evans had to warm his hands between numbers with a space heater. He declared himself unsatisfied with his performance, saying, "My brain knew what it wanted to do but my fingers didn't want to cooperate." Perhaps the vigor of these performances was partially the result of his desire to offset the cold's effect on his hands. At any rate, it's impossible to fault his technique on the evidence of the nine tunes presented here.

Accompanied by bassist Eddie Gomez and drummer Marty Morell, Evans opens with "One for Helen," written for his manager Helen Keane and which Evans had recorded six years earlier at Montreux. His authority as a pianist is evident from the first notes. Evans's trio is more nearly democratic than most—drummer and bassist generate ideas as well as accompany. Listening to an Evans trio is like happening on a vigorous three-way conversation. Evans plays the expected ballads here, including a particularly gorgeous "If You Could See Me Now." He reprises two pieces he made with Miles Davis: "Blue in Green" and "So What." He also plays five of his own compositions, including his "T.T.T.—Twelve Tone Tune," which, despite its formidable title and twelve-tone technique, turns into a particularly joyous workout for the rhythm section.

The music was taped by the CBC, then remixed and digitally mastered in Fantasy Studios. There is little stereo separation, but that seems a minor drawback given the immediacy of the recording and the fine sound of Evans's piano. The trio was recorded closely—one doesn't get the ambience of the concert hall. Neither do we get the sounds of the crowd intruding on the music, except in occasional bursts of applause. This disc allows us to immerse ourselves anew in Bill Evans's astonishing creativity. What more could a jazz fan ask?
—Michael Ullman

ABBEY LINCOLN: ***You Gotta Pay the Band***
Abbey Lincoln, vocals; Stan Getz, tenor sax; Hank Jones, piano; Charlie Haden, piano; Mark Johnson, drums
Verve 314 511 110-2 (CD only). Richard Applegate, eng.; Jean-Philippe Allard, prod. DDD. TT: 58:32

Abbey Lincoln's not the usual nightclub crooner. She has a brassy, seemingly unromantic voice, yet few singers are as dramatic or, at times, as

tender. An actress as well as a songwriter and singer, she decided years ago not to concentrate—in her writing at least—on lovers and nighttime romance. Her own songs start out as poetry: she thought of "Bird Alone" when in Japan feeling lonely, and "When I'm Called Home" came from an intimation of her own death. Hardly cheerful subjects, yet her sincerity, vigor, and musicality make these songs work.

She couldn't have a better band behind her. *You Gotta Pay the Band* features Stan Getz in what must be among his last recordings. (This disc was recorded in February 1991.) The bassist is Charlie Haden, Mark Johnson is the drummer, and the pianist is the marvelous Hank Jones. A songwriter couldn't ask for more than Hank Jones's exquisitely shaped and suggestive introduction to "You Gotta Pay the Band," or hope for more than his and Getz's solos on numbers such as "When I'm Called Home." Lincoln's melodies are simple, often innocent-sounding: Getz lights them up.

Besides her own songs, Lincoln revives, in what may be the masterpiece of the set, the depression-era plaint, "Brother, Can You Spare a Dime?" There's irony as well as iron in her voice—she sounds tough, vulnerable, adult. On several other numbers, such as the title track, her voice sounds a bit worn. But her band carries the songs—I hope she paid them well.

I have several minor complaints about the sound: the bass is not as tight as one would want, and Mark Johnson's drum set is spread across most of the soundstage. One hears his hi-hat at the extreme left, seemingly close up, and his snares somewhere in the middle and rather distantly. There's no point in this kind of separation. **—Michael Ullman**

LIONEL HAMPTON & THE GOLDEN MEN OF JAZZ: *Live at the Blue Note*
Lionel Hampton, vibes; Clark Terry, trumpet, flugelhorn; Harry "Sweets" Edison, trumpet; James Moody, Buddy Tate, tenor saxes; Al Grey, trombone; Hank Jones, piano; Milt Hinton, bass; Grady Tate, drums
Telarc CD-83308 (CD only). Jack Renner, eng.; Bill Titon, prod. DDD. TT: 58:07

OSCAR PETERSON: *Saturday Night at the Blue Note*
Oscar Peterson, piano; Herb Ellis, guitar; Ray Brown, bass; Bobby Durham, drums
Telarc CD-83306 (CD only). Jack Renner, eng.; Robert Woods, prod. DDD. TT: 57:00

OSCAR PETERSON: *Time After Time*
Oscar Peterson, piano; Joe Pass, guitar; Dave Young, bass; Martin Drew, drums
Pablo PACD-2310-947-2 (CD only). Steve Williams, eng.; Oscar Peterson, prod. DDD. TT: 48:00

In his notes to *Time After Time*, critic John McDonough recounts a revealing conversation he had with pianist Oscar Peterson. McDonough calls Peterson "prolific," not merely because of the enormous number of Peterson recordings, but as a description of Peterson's "dense, demanding, unceasing" style. He adds, "When one gives an audience so much, one risks that they will leave with nothing." Peterson replied—and I think it's the perfect answer—that "What happens on the stage is my concern; what happens in the audience is theirs."

Without wanting to, McDonough has put his finger on the uneasiness with which many of us listen to Oscar Peterson. Peterson swings mightily, he's a dazzling instrumentalist, a fine accompanist, and in his more modest performances, such as the ones we hear on *Oscar Peterson Plays Cole Porter*, he's a first-rate melodist. He specializes in the blues: not the funky, down-home kind, but mid- and uptempo pieces, such as "Kelly's Blues" on *Saturday Night at the Blue Note*, that are bright and extraverted. "Kelly's Blues" features an attractive theme played firmly and precisely. It builds and builds. But there's the rub: somewhere along the line, I lose interest. Peterson's rhythmic devices, his big-band–like riffing and two-handed chording, are powerful, but make me feel like I'm on a train in a funhouse. I know where I'm going, and, despite all the spectacular sights along the way, I'm biding my time until I get there.[2]

Peterson can be wonderful, as he is on one of his older routines, "On the Trail," heard on *Time After Time*. He also can be lyrical. Both Peterson discs reviewed here feature his pretty "Love Ballade," and I find his playing on "Old Folks" from the Blue Note session lovely. He still loses me on the big production numbers, and another of his ballads, "Nighttime" from the Blue Note session, seems sentimental.

One main feature of *Live at the Blue Note* is that it reunites Peterson with two members of his old trio, Ray Brown and Herb Ellis. It's always a joy to hear Brown and Ellis, especially as recorded by Telarc. I wish Ellis's guitar had been brought forward a little more, but Brown sounds just as I've heard him live: marvelous. Peterson's piano sounds more resonant on the Telarc than on the Pablo recording, which features the virtuoso guitarist Joe Pass instead of Ellis. Perhaps as a result, Peterson is a little perkier on the Pablo version of "Love Ballade." For the rest, these are two good examples of Peterson's recent playing. The fans continue to love what he does.

They continue to love Lionel Hampton as well; Hampton, one of the greatest showmen in jazz, loves them back. At the end of the stir-

2 Peterson seems always to play things too safe to be considered a jazz great, in my humble opinion. Having played with Martin Drew a couple of times in the early '70s, I was initially surprised when the English drummer joined the permanent Peterson Trio. But on reflection, Drew, as a musician with a superb technique but totally conservative feel, was the ideal choice. **—JA**

ring jam session that Telarc recorded live at the Blue Note, the band is clearly walking offstage. Hampton calls out a rhythm, and the next thing you know, pianist Hank Jones is playing boogie-woogie for one of the rare times in his professional life, and Hampton is beating out his "Hamp's Boogie-Woogie." Irrepressible, he's surrounded himself with some of the best surviving mainstream players, and everyone seems to be having a ball. The trot out their specialties: Clark Terry takes a solo alternately on flugelhorn and trumpet, eventually trading phrases with himself. James Moody sings his famous solo on "I'm in the Mood for Love." Harry Edison plays the first lyrical solo on "I Wish I Knew"; Al Grey growls a couple of plunger solos, and Buddy Tate swings throughout. With an impeccable rhythm section, this disc is straightout fun. It's beautifully recorded, especially for a live date. Even the sounds of the audience are clear and precise. Here's an unpretentious set of jazz by masters, golden men, doing what they do best, *con brio*.

—Michael Ullman

Rock

LUKA BLOOM: ***The Acoustic Motorbike***
Reprise 26670-2 (CD only). Paul Barrett, prod.; Paul Barrett, Sean Devitt, Louise McCormick, engs. AAD. TT: 46:41

Luka Bloom's first album, *Riverside* (Vol.13 No.8), was a plunge into icy water so fresh and bracing it stole breath. LB says *Motorbike* is far "less produced," but it seems a whole lot *more* so to *me*. The rhythms and melodies are far simpler/less interesting and far more overwrought, more ado about less, and not *nearly* as much fun as *Riverside*'s. Besides, Bloom hears something in Rap—the Disco of the late '80s/early '90s—that I don't. Three of the dozen tracks here are Rap, including a cover of LL Cool J's "I Need Love." Bloom finds Rap's "rhythms and phrasing, from a purely technical point of view, phenomenally sophisticated." Huh? I tested this myself, singing along, lyric sheet in hand, with Bloom's two original Rap tracks, and got the phrasing with 95% accuracy the *very first time* I heard these songs—and believe me, a singer I ain't.

Anyway. Bloom was so much more convincing on *Riverside*'s true *Irish* Rap songs like "Delirious," "Over the Moon," "An Irishman in Chinatown," and "You Couldn't Have Come at a Better Time": passionate, urgently joyous words tumbling over each other in rhythmic grace to virtually unaccompanied acoustic guitar. *Motorbike*'s few good winsome ballads—"You," "I Believe in You," "Exploring the Blue," and a heart-on-sleeve cover of "Can't Help Falling in Love" that has the same intensity of the *other* Elvis's 1:29 cover of "Funny Valentine," LB stepping aside to let tune and words do the work—do not a recommendable album make. The songs go by, and not only do they not change my life, they don't even change my *morning*. And the sound is far inferior, lacking *Riverside*'s depth, presence, and in-the-round palpability—*Motorbike* sounds like a cassette dub of itself. Too bad; altogether, a disappointing victim of Second Album Syndrome.

—Richard Lehnert

ERIC CLAPTON: ***Slowhand***
MFSL Gold Ultradisc UDCD 553 (CD only). Glyn Johns, prod. AAD. TT: 39:21
RSO/PolyGram regular ol' CD 823 276-2 (CD only). AAD. TT: 39:18

If you read my review of MFSL's gold Ultradisc version of the Who's *Quadrophenia* in January, you know what I thought of *that* reissue: inexplicable motives, unworthy material, and sonics that weren't improved a bit over the original release. In all, a smashing unsuccess.

But now I've got to eat my words on a bed of brown rice, because MFSL's really done a kick-ass job with *Slowhand*! My years-old RSO/PolyGram CD is easily one of the worst-sounding digital transfers in my collection,[3] a laughably weak version of a great LP. This gold Ultradisc, though, is MILES ahead of my RSO CD, and while it doesn't quite edge the LP, it fits better in the Madrigal CD Library.

I've always really liked *Slowhand*, the last of Clapton's real *rock* records before he sank into that late-'70s/early-'80s lite-rock malaise he's only just crawled out of in the past five years. '70s FM radio just wouldn't have been the same without such *Slowhand* staples as "Cocaine," "Wonderful Tonight," "Lay Down Sally," and my favorite song on the album, "The Core." There's really not a clunker on here, except maybe "Peaches and Diesel," and then only if Clapton's love-puppy side makes you hurl as it kind of makes me do, although Patti was reportedly well worth the sappiness.

Shortcomings: MFSL's *still* using their demented "2001: A Convenience Fallacy" deluxe jewelbox that saves you the HASSLE? of lifting the disc off the center hub, but trades that luxury for increased stress when trying to put the CD *back* unless you have the jewelbox fully open in your palm and that's just one more thing to think about in a world of ever-in-

3 Every other West German–manufactured PolyGram disc in my collection sucks sonically, too; my copy of Jimi Hendrix's *Band Of Gypsys* is HORRENDOUS, as was the German CD of *Smash Hits* compared to the US disc. The PolyGram discs even *look* cruddy, with that silvery top coat that flecks off with time and the sharp, too-thin edges. I thought West Germany was a bastion of High Quality; don't they have Keebler Elves or something, making sure stuff like this passes muster?

creasing duties to perform and combinations to remember and alliances to ponder and agendas to mull over and details to reconsider and relationships to explore and options to peruse and MUSIC TO HEAR!!! Man, I hate Mobile Fidelity's jewelboxes so much I swapped *Slowhand*'s out with *Merry Xmas From Wayne Newton* just so I wouldn't even have to THINK about it again, at least until I get my bi-yearly hankering for a little bit o'the Newt-skateer, and that shouldn't be a problem again until at least mid-November.

Conclusion: In addition to giving up *much* better sound than my RSO CD, MFSL's *Slowhand* also re-includes the original LP's photos and musician roster missing from my CD. If you like *Slowhand*, the MFSL is definitely worth the extra bucks. Now, how about *Disraeli Gears*? GO MFSL GO! —**Corey Greenberg**

EMMYLOU HARRIS & The Nash Ramblers: *At the Ryman*
Reprise 26664-2 (CD only). Allen Reynolds, Richard Bennett, prods.; Mark Miller, Kooster McAllister, engs. ADD. TT: 60:56

After 15 years of fronting her Hot Band, Emmylou's gone acoustic with this live set of new (to her) material recorded at Nashville's Ryman Auditorium, for 30 years the home of The Grand Ol' Opry. She claims that, after a serious attack of bronchitis, it was just too much strain on her weakened voice to any longer dominate an electric band.

Well, I applaud the move to acoustic; the new Nash Ramblers are tight, talented, and lusciously recorded (if with a patently unbelievable mix and the patented Kooster McAllister HF beef-up; cut the boost, Koost!), and Emmylou once again shows off her perfect taste in choice of songs. But the gradual drying-out and whitening of her voice, evident as far back as her third album, *Luxury Liner*, has by now progressed to virtual rawness. On *At the Ryman* she has a great deal of trouble controlling her voice at all.

I hope the trend is reversible, but it's not the only problem on this album. Though the instrumental arrangements are always interesting, the multi-part vocal harmonies often sound centerless. Still, the players (Larry Atamanuik, Roy Huskey Jr., Sam Bush, Al Perkins, Jon Randall Stewart) are state-of-the-heart country, and there's a new, hard-edged bluegrass influence to take the place of the Hot Band's country-rock drive.

But Emmylou skates lightly over most of these songs, which deserve better: on Steve Earle's "Guitar Town" she's sloppy and emotionally absent; she doesn't even scratch the surface of Springsteen's "Mansion on the Hill"; and on "If I Could Be There," she just sounds exhausted. Then again, there's a perfect performance of Tex Owens's yodelin' "Cattle Call," gorgeous four- and five-part harmonies on Stephen Foster's "Hard Times" and the *a cappella* "Calling My Children Home," and Emmylou finally, ten years on, drops the other shoe to record John Fogerty's "Lodi" (the B-side of Creedence's "Bad Moon Rising," which she recorded in '81 on *Evangeline*).

At the Ryman constitutes a great album concept that only works half as well as it might have. Still worth hearing and buying, however; even mediocre Emmylou Harris is better than almost any other country singer's best.

—**Richard Lehnert**

VARIOUS: *Until the End of the World*
Warner Bros. 9 26707-2 (CD only). Various engs. & prods. AAD. TT: 69:36

Ben E. King did it. Meatloaf did it. But when Nick Cave sings "I'll love you 'til the end of the world" on the soundtrack to the new Wim Wenders movie, it's more than just a last-ditch pickup line. Get this: it's 1999, and there's this Indian nuclear satellite that's about to crash to earth. Boom! Splat! No more Chuck E. Cheeses. No more Burger Kings. Then there's John Hurt wandering around with this machine that can play back your dreams on a Sony Watchman. And that's when things really start to get complicated.

In case you hadn't guessed, *Until the End of the World* is not a George Lucas production. But, hey, Wenders can tell you that being cool is almost as good as being rich. You can get a big star like Peter Falk to take off his trench coat and play in your artsy-fartsy Fore-i-peeean movie. Spike Lee threatens to punch your lights out.[4] And when you're soundtrack-shopping you get your pick of anybody on the charts south of Garth Brooks and Michael Jackson. So in the best schoolyard kickball tradition, Wenders chooses up sides real good: Talking Heads, R.E.M., Elvis Costello, U2, Lou Reed. The Wimster just mosies up to these guys, talking up the whole Indian satellite thing, and says, "How 'bout some music to get nuked by?" No problem. It's not like he was asking Bon Jovi and Amy Grant.

The Armageddon Hit Parade Countdown starts off with the Talking Heads' "Sax and Violins" (get it?), the first peep we've heard from them in five years. And, surprise, it's about as bouncy a song as you can write about the end of civilization as we know it. David Byrne even throws in the F word twice. Maybe he missed Tina Weymouth as much as I did. Down the road, the ever-grouchy El Costello pitches with an absolutely lilting cover of Ray Davies's

4 Mars Blackman's alter ego was pissed that *Do the Right Thing* didn't win the Palme D'Or at the Cannes Film Festival a couple years back when you-know-who headed the jury.

"Days." And even those serious lads from Dublin borrow a page from "Paradise by the Dashboard Light": "I kissed your lips and broke your heart / You, you were acting like it was the end of the world." Achtung, baby. Sure, R.E.M.'s Michael Stipe still sounds like he's not getting enough fiber, but all in all, this is easily the most downright pleasant, up-with-people nuclear holocaust album ever made.

The other surprise is that the best music here comes from the people your brother-in-law never heard of. Julee Cruise proves that there's life after Twin Peaks with the me-so-flirty "Summer Kisses, Winter Tears." How 'bout one more slice of cherry pie and another cuppa jo? The other highlights: a Pampers-free comeback from Patti Smith, a lovely north-of-the-border duet between Jane Siberry and k.d. lang, and a dose of oooozing Cajun/Canadian folk from Daniel Lanois. My personal fave here comes from another of the producers, T. Bone Burnett, who turns the whole space alien idea inside out with "Humans from Earth." It's the kind of thing you'd have watched on Creature Feature if Jean Luc Godard was working for Roger Corman.

If this is the sound of the future, maybe it's time to rip open the mattress and buy some stock in Audio Research. Although more than a dozen engineers stuck their fingers in the broth, there's a remarkable sonic coherence here. If these tracks are from the sonic collage school of recording, then these guys graduated with honors. There's good instrumental spread, a convincing illusion of depth, and the low bass ranges from solid to "We want you out of here by the end of the month."

And if this is the music we'll be listening to as we head to the millennium, I can live with that, too. As if I had a choice. Still, I got one problem with Wim's plot line. If Skylab Masala was about to squish me like a Palmetto bug, I sure hope I could find something better to do than stare at a Talking Heads video, even if it's on HDTV. In the words of a great 20th-century philosopher much beloved by our Editor: "Two thousand zero zero / Party over / Oops / Out of time / I think I'm gonna party like it's 1999." So if you want to watch television and furrow your brow come checkout time, that party's over at Barry McGuire's house. Me, I'm just gonna turn down the lights and turn up the music.

—Allen St. John

OUTTAKES
RICHARD LEHNERT

I SHALL BE UNRELEASED: ***The Songs of Bob Dylan***
Joan Baez, Blue Ash, Johnny Cash, Eric Clapton, Dion with the Wanderers, Dream Syndicate, The Hollies, Jah Malla, Manfred Mann, Roger McGuinn, Rick Nelson, New Riders of the Purple Sage, Raiders, Doug Sahm, Pete Seeger, The Staple Singers, Rod Stewart, Ron Wood
Rhino R2 70518 (CD only). Many, many producers; Bill Inglot, Ken Perry, digital remastering. AAD. TT: 63:53

Hey, *this* is fun: 18 very obscure Dylan songs sung and recorded over the last 25 years by an outrageous variety of admirers. Even with the release last year of Dylan's own *Bootleg* box, you'll only have found eight of these tunes on previously released official Dylan albums. The rest include the best-known tracks—Joan Baez singing "Love is Just a Four-Letter Word" from back when she still cared about music, Manfred Mann's "If You Gotta Go, Go Now," Rod Stewart's classic version of "Only a Hobo" from his own best album, *Gasoline Alley*—plus the Staples' cover of the unjustly neglected, absolutely chilling, early anti-war song, "John Brown," which Dylan has resurrected on recent tours. There are duds too: Blue Ash thrashing and trashing "Dusty Old Fairgrounds," and a terrible recording of Pete Seeger's vacant run-through of "Paths of Victory." But Dream Syndicate's "Blind Willie McTell" is killer. For any serious Dylan fan, a must.

JACKSON DELTA: ***Acoustic Blues***
Jackson Delta JD 0012384 (CD only). Jackson Delta, prods.; Jamie Sulek, eng. DDD. TT: 43:38
Available from Rick Fines, P.O. Box 2384, Peterborough, Ontario K9J 7Y8, Canada. Tel: (705) 748-9784.

Contemporary white acoustic blues—you know, the kind all critics & blues aficionados are supposed to *hate* for its parasitism, inauthenticity, and wannabe-itude? Well, da blooze is just as hard—or as easy—to do well as anything else, *no*body's got an ethnic corner on it anymore (sorry), and these three Canadians sound at least as real as the much-touted (in these pages) Robert Lucas. Jackson Delta does seven blues standards ("Statesboro Blues," "Baby Please Don't Go," "C.C. Rider," etc.), but the five originals are by far the most interesting tracks, particularly the been-there-and-sounds-it "Back Up from Zero," the driving "Bad News Blues," and the J.L. Hooker-influenced "Sink or Swim." This is homemade, late-night, bare-bulbed, linoleum-floored, unapologetic white-*man* kitchen blues with gritty vocals, solid arrangements, tight guitar/harp interplay, and always biting rhythms. *And* it's all live in the studio, direct to two-track—sound is *very* natural, totally unhyped. So what are you waiting for? Buy it.

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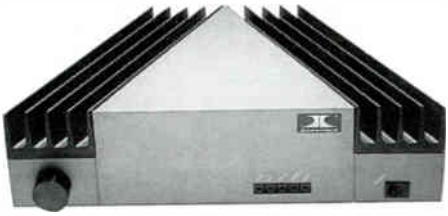

e n s e m b l e

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MR. BIG: ***Lean Into It***
Atlantic 82209-2 (CD). Kevin Elson, prod.; Kevin Elson, Tom Size, engs. AAD? TT: 46:30

These four seasoned graduates—Pat Torpey, Eric Martin, Billy Sheehan, and Paul Gilbert—of various hard pop and speed-metal bands have turned in a *very* sharp, slick second album, all power hooks and flash. Not really my kind of music, *but*—that acoustic (!) single everyone's heard by now, "To Be With You," is one of the most infectiously feel-good pop songs to hit the US's ever-shortening AM/FM playlists since the Beatles. I don't care if all you ever play on this CD is track 11: it's still worth your $15.98 for "To Be With You."

PULNOC: ***city of hysteria***
Arista 07822 18668-2 (CD only). Robert Musso, prod., eng. AAD? TT: 61:14

This once-banned Prague band, formerly known as The Plastic People of the Universe (after Zappa's "Plastic People"), is now called Pulnoc ("Midnight"). Unfortunately the most attractive thing about their first US release is Vaclav Havel's introductory essay. Otherwise the music is monochromatic, heavy, humorless, and not very interesting—and since they sing mostly in Czech, the music is all you've got. Too bad; I expected more from a band of such political and historical importance. **$**

MANUFACTURERS' COMMENTS

MICROMEGA TRIO CD PLAYER

Editor:

Please extend my best regards to Bob Harley. He got to the very essence of the Trio's musical impact to an extent that I never imagined happening in a review. The musical connection with emotion, rather than the intellect, is what I have perceived to be the goal all along.

As fine as the impact of the music was on Bob, some of his other comments lead me to believe that he did not get the maximum out of the product. Bob's observations of soft bass, lack of very low bass, and soft dynamics are just the results I would expect with this product plugged into a power conditioner, or even possibly using an unsuitable power cord. My own experience with the Trio in multiple systems has never resulted in these effects.

As regards what fun it is to read about the different techniques that various designers choose to use, I think that, in the end, this can be quite harmful in a way that may not be obvious. As is often stated by the press, a customer must listen to a particular product, and make their own emotional musical audition before purchasing it; otherwise, they may never be happy with it. As everyone seems to know, the bulk of expensive high-end purchases are not made this way. This is a result of the impracticality of properly auditioning equipment (almost never available to be listened to at home, with no "expert" or purchase pressure), and the general press of time in modern life. It is almost a requirement that the customer must make improper use of the information available in the magazines.

While the customer may enjoy reading about all the technical goop, none of which has a real bearing on the sound of a product, he will inevitably use that very information, this technical aura, to make what is often a very incorrect decision for him. The customer needs to know that, particularly with the complexity of Compact Disc, he can *never* use this information to help make a useful musical decision.

I believe that I understand the odd 60Hz, 120Hz, and 240Hz noises seen in the measurements. I have had similar problems at various times myself. It is my understanding that the noise always showed up in the measurements but could not be heard through an audio system turned up high enough (with no signal) to hear such a phenomenon. My strong suspicion is that the test conditions are the cause. The test conditions were, as I understand them, that the Trio sat on a fairly flexible bench with the other test equipment. This bench was free to—and in fact did—vibrate with the fans of the test equipment. The Trio has a very rigid connection to what it is sitting on—a necessity for its excellent performance. I expect that any test signal passed through the Trio would be modulated by the vibration (essentially low-frequency jitter), while with no signal being passed, the noise ceased to exist.

Lastly, while the Trio is a three-box unit and can very rightly be thought of as a CD player, it is not so closed a system as might seem. The converter and power supply are available as a package; a self-powered version of the transport, the Duo.CD, is also available. While this clearly opens up some options, I strongly suggest that these components are well matched; as Bob's review seems to indicate, there is little reason to look elsewhere for one or the other component.

Well done, Bob.

JOHN BICHT
Versa Dynamics, Inc.

BRYSTON 4B NRB POWER AMPLIFIER

Editor:

Bryston is both flattered by and appreciative of the thoroughness of the review of our 4B NRB amplifier, and for the many complimentary comments by Dr. Greenhill.

With reference to one (whimsical?) aside about the possibility of "rock-solid" audio products like the 4B NRB perhaps being wasted on audiophiles who are likely to change equipment too often to benefit from the rugged construction, I would make three gentle points:

1) We have found over the years that Bryston owners, for some unfathomable reason, seem to keep our products for a very long time, to the extent that it is quite difficult to find a used

Bryston for sale.

2) For those Bryston owners who would like to change in future, we have found that Bryston products retain a remarkably high resale value, which we at least partially attribute to the recognition of solid construction to long life and extended usefulness.

3) Most important, the type of high-quality manufacturing techniques which are necessary to a long warranty period and to reliability under difficult conditions pay more immediate dividends in better sound quality. An example is such a simple element as the power-supply filter capacitors. To produce a long-life component of this type, one must design for the lowest possible internal resistance, thus reducing heat generation. This type of design, by happy coincidence, turns out to be necessary for the kind of "amazing bass response" and "focus, width of soundstage, and depth of image" referred to by Dr. Greenhill.

Christopher W. Russell
VP/Engineering, Bryston, Ltd.

TANNOY 609 LOUDSPEAKER

Editor:

This has been quite a lengthy undertaking for you. Looking back through my records, the 609s were originally requested in early September 1991—before I even had any in the US to send! Anyway, congratulations on a thorough and detailed job. Obviously, we are disappointed with our results; I would ask your readers to kindly step back somewhat from the specifics therein, so I can plant some seeds.

The current and mainstream path of reproducing sound is through multi-driver, cabinet-based systems. Why is this? In reality it is because we, in our early days as an industry, did not have the ability (through lack of available technologies) to produce a moving-coil speaker that could reproduce the full audio bandwidth using a single element. (This is desirable, since all sounds are produced from a "point" in space and because it is cheaper to manufacture one unit than two!) The compromise, therefore, was to split different frequency regions (bass, midrange, and treble) between different drive-units which could work effectively over their chosen, relatively narrow bandwidths. There are inherent flaws in this thinking that must ultimately limit the ability of any "regular" two- or three-way system to accurately reproduce music, or any other sounds. I would like to highlight one that is a very simple concept to grasp.

We all automatically sit in front of speaker systems at the apex of a triangle, and without thinking about it position our head in "the sweet spot." Well, what is "the sweet spot"? It is the position in which our ears receive the flattest frequency response and the maximum acoustical power output from the speakers we are auditioning. When we move our head out of "the sweet spot" we are subject to the acoustical effects of the changes in distance to our ears from the individual drive-units involved. Hence, no flat frequency response, and a dramatic reduction in acoustical power output at the crossover frequencies of the individual drive-units.

Yes, all designers are aware of these problems. Indeed, it spurred the rush of "Linear Phase" speakers during the '70s and into the present day. Crossover design is always compromised in two- and three-way systems because the designer is trying to think of cunning ways to reduce the "sweet spot" effect and maintain acoustical power through the crossover region.

Tannoy has uniquely come along a path of different priorities. The above compromises have never been acceptable to our designers; since 1947 we have prioritized our designs around acoustical point-source principles with our "Dual Concentric," a two-element design sharing common acoustical centers. What benefits does this supposedly bring? Well, surprise! No "sweet spot" in the conventional sense—just a gentle lowering of level and HF energy as one moves off axis—and a flat power response right through the crossover region.

We believe it is this flat power response that your panel found so disturbing and different. Extra energy in the room through the highly sensitive midrange area is a new experience for many people. Yes, $599 loudspeakers have coloration, but I believe that the panel overlooked the honesty and ability of the new Dual Concentric in this respect.

There are other real-world benefits from this type of design approach which we can leave for another discussion, along with cabinet design. Anyway, there's my lengthy contribution to this month's issue. Thank you again for your efforts and the opportunity to respond.

Barry Fox
Director of Sales & Marketing, Tannoy

NELSON-REED 5-02/CM LOUDSPEAKER

Editor:

Wow! Well done! What a Herculean effort *Stereophile* devoted to this group of entry-level loudspeakers. On reflection, though, one *should* spend more time and energy on such products in order to better advise the budding audiophile. The novice needs more guidance, even if only (yes, *only*) spending $500 on his loudspeakers. A misguided purchase on that first system may sour one's taste forever.

Nelson-Reed fully supports comparative reviews on similar-class products. We feel that this is the only way a reader can sort out the

many trade-offs and decide what features or qualities best suit his needs. We also support the blind listening test procedure that *Stereophile* used in this review. As noted by TJN, blind testing is not the ultimate. It is, however, one of the best ways to sort the wheat from the chaff, enabling one to dedicate further effort to products that offer value.

Although we have seen only the portion of the review that pertains to our model 5-02/CM, and the relative ratings, we can just hear the screaming that is sure to come from both readers and manufacturers. Let it be known that Nelson-Reed fully agrees with *Stereophile*, based on our own listening tests, both in the method and the relative ranking results of this review.

Yes, you read right, we feel that this review was as well done as one could hope for. The strengths and weaknesses, the subtleties and the nuances of the model 5-02/CM were so accurately described that we almost wonder if *Stereophile* has a hidden microphone in our test lab. This is a strong statement from a company whose product came out second to last.

No, we're not insane or self-destructive. But we were a bit chagrined when we realized that we submitted the *wrong* loudspeaker model for this comparative review. This review compares bookshelf loudspeakers; and the 5-02/CM is not by any stretch of the imagination a bookshelf loudspeaker. We know, we make a bookshelf loudspeaker of our own, the model 6-02/CM. Chalk up this screw-up to a mutual miscommunication between Nelson-Reed and *Stereophile*. We both should have taken a little more care in selecting the right product. We liken this review to a comparison of mini-vans, with a Porsche 914 accidentally slipped into the mix. The Porsche would not fare well; it can't haul the kids, the gas mileage is bad, and the cargo space is, ahhh, a little lean.

In a sense, the reader may be left with an improper perspective as to the true performance of the 5-02/CM.

Then again, maybe not.

Now this is where the blind listening test flexes some muscle. The Nelson-Reed 5-02/CM is not a bookshelf loudspeaker, but a much smaller *minimonitor*. When the blind listening test was performed, the review group had no way of knowing this. Under blind listening, each of the loudspeakers is judged without knowledge of its physical type. It is up to the person setting up the test to use similar-type loudspeakers in order to compare apples to apples. The 5-02/CMs would naturally be regarded as absurdly thin, if one did not realize that one was comparing apples to oranges.

This is the advantage of the blind test. Had the review panel been able to *see* the loudspeakers, each would expect less bass out of the visibly much smaller 5-02/CM—and automatically adjust to a lesser bass-performance standard. In essence, the reviewers' *expectations* would color the results.

For example, JA, under non-blind conditions, concluded that the 5-02s "offer about as much bass and dynamic range as you might expect from their diminutive proportions." This comment is a far cry from JA's criticism under blind conditions.

Which evaluation is correct?

Both of them.

Under non-blind testing, one would expect statements like "this loudspeaker has all the bass that one can expect from its size." The reader would be left all the more confused. However, under blind testing the low scores for bass performance earned by the 5-02/CM clearly show that the size/performance bias was removed. The reader is left with an unambiguous ranking within the classification of "bookshelf loudspeaker." If one is looking for a full-range, stand-alone bookshelf loudspeaker, the 5-02/CM may not be the best choice, as the blind test clearly shows.

Now we advance to the non-blind half of the *Stereophile* test.

After ranking the sonic qualities, the reader also should know how a loudspeaker performs in terms of what the reviewer expects. A loudspeaker with adequate bass, but enclosed in a cabinet far too large or cumbersome, may now be viewed as a poorer choice. Loudspeakers that have frustrating quirks like bad connectors or cheaply assembled cabinets may be duly criticized. Likewise, a sonically modest product that offers cost and size advantages may now be more highly recommended.

By reading JA's in-depth report, one may see that the Nelson-Reed 5-02/CM performs as expected—*for a minimonitor*. JA's comments on the 5-02/CM need little elaboration; his description of their sonic signature mirrors Nelson-Reed's own observations. As JA noted, one may perceive a lack of depth in the 5-02/CM. Addition of the optional subwoofer (Nelson-Reed model 1201) corrects this situation. Low-frequency extension is required for optimal soundstage presentation, according to JGH.

About the only thing that JA could not figure out was the source of the [low treble] "phlegm" that he heard. John, it isn't the cabinet, it's the foam termination on the woofer; it rings at 1.1kHz for 2ms (longer and a bit higher in frequency at your mile-high altitude). Reed's Rule: Resonances in chalk-doped Tupperware (Bextrene) *cannot* be created or destroyed, only moved to new and unexpected frequencies.

With 20-20 hindsight, Nelson-Reed should have submitted the model 6-02/CM rather than the model 5-02/CM for review in this category.

All was not lost, however; the 5-02/CM provided some valuable insights about relative strengths, weaknesses, and pitfalls of both blind and sighted reviewing.

In summary, we feel that *Stereophile* did one heck of a job with this review; and we at Nelson-Reed hope to see more work of this caliber.

W. B. Reed, R. L. Nelson
Nelson-Reed

A/D/S/ SAT 6 LOUDSPEAKER

Editor:

Thank you for including the a/d/s/ model SAT 6 in your panel audition of nine inexpensive loudspeakers. It was nice to have one of our latest designs explored by expert ears, and have it find its way onto several of your panelists' "favorite few" lists. The article's wordsmithing was extraordinary, and though, as you mentioned, "there was no shortage of negative reaction to *any* of the loudspeakers," the critique goes down a little easier when subjective annoyances translate to "a midget. . . hidden inside the box busily tearing up a telephone book." We certainly appreciated the positive comments as well, such as "he liked the a/d/s/ better than most of the contenders," "articulate, lively, dynamic," "he rated the a/d/s/ fairly high overall," "the low end. . . was reasonably well-defined," "I found the soundstaging. . . relatively three-dimensional," "I was favorably impressed by the openness of the sound," and finally, "the resultant soundstage was wide and deep, and image outlines were reasonably well-focused in space." Of course, then we ran into that midget, and whammo—we got hooty and strident. Just when we thought it was safe to go outside. . .

At any rate, we're always proud to have a/d/s/ product evaluated by experts. We also tend to look for the negatives in our own analysis, because it's in finding those faults and exploring their causes that we find paths to better sound.

Several of the comments regarding your objective and subjective data guessed at possible causes for the observed phenomena.

First, a note on our market and direction since your last experience with the model L810 of the 1970s. We indeed *have not* gone mass-market, but rather have focused exclusively on customers who appreciate a balance of performance, technology, and style. This combination does come at a cost, and hence the SAT 6 was at the high end of your group's price scale. Our products are sold exclusively through specialty audio shops typified by the PARA (Professional Audio Retailers Association) members who make up a large part of our distribution. Many of our dealers were around to have sold the L710s and L810s, and later the equally heralded L570, L780, and L1290. As lifestyles have changed, so have our products. We now offer more upscale satellites and subwoofers (powered and passive), and feature fourth-order L.R., bi-wired, and multiple-board crossover networks, and the industry's only stainless-steel ultra-rigid voice-coils. Having always considered appearance another important element of the product's design, we incorporate both Braun-Design and frogdesign styling in our current line of products. We have flagship products, such as our M20 and M30 towers, designed for the music room, and have also paid careful attention to bringing this same sound quality to our home theater and whole-house music-system products, where we offer a broad range of upscale models.

The SAT 6's response dip at around 3800kHz is caused not by a crossover-region artifact, but by the dimensional geometry of the front baffle and the tweeter location. It relates to a change in radiation resistance at that wavelength, which is nearly an octave above crossover. In fact, one of the benefits of the 4th-order filtering is to bury the inevitable crossover-region anomalies that occur in a very narrow and less audible bandwidth. The baffle-related dip is a 0° issue and perceptually disappears when the speakers are aimed directly forward rather than toed-in. We, of course, recommend the former. The treble lift is a little exaggerated in your measurement, but it is there by virtue of the fact that this speaker's crossover was tuned for its grille to be left on.

Both of these relate to the practical trade-offs a design must incorporate for its target customers. The baffle dimensions are somewhat dictated by customer preference for style and utility. Larger dimensions, trapezoidal shapes, and vertical axis tilts can improve this phenomenon. We chose a more conservative shape while incorporating a floating isolated baffle and stainless-steel voice-coil, which helps remove some colorations, which may not appear in simple measurements, but most certainly can be heard, and appreciated when removed. The grille-on optimization is not the audiophile approach, but many of our customers must deal with the three "K" words: Kids, Kats, and Kneighbors!

Finally, there is one very significant factual error repeated throughout the article. The logo of our company contains three virgules (a/d/s/), not just two (a/d/s). These virgules are much more valuable than mere slashes. I suspect the midget stole them!

John R. Bishop
Executive Vice President, a/d/s/

PINNACLE PN8+ LOUDSPEAKER

Editor:

We wish to thank *Stereophile* and its contributors

for including the Pinnacle PN8+ speaker system in this issue's Battle of the Boxes. We are pleased that the panel found favor with a number of the PN8+'s attributes. Especially, we are gratified to be further recognized for the cost/performance ratio that has enabled the PN8+ to consistently command respect and customer loyalty in the marketplace when compared to its more costly competitors. Thank you also for your high praise of our owner's manual. We find that a number of customers call us for answers to questions or problems that they eventually admit could have been resolved themselves had they only read the manual! *Stereophile*'s encouragement here is appreciated.

Careful reading of TJN's and the rest of the *Stereophile* panel's comments brings us to the following observations:

We are generally impressed with the care taken toward the various approaches used in determining both objective and subjective findings about the speakers under test. We do feel, however, that in addition to the otherwise well-chosen musical selections used, a representative piece of well-done heavier rock would have more completely rounded out the listening tests. Although subject to debate as a viable test source, and certainly not everyone's cup of tea, we nonetheless recognize the importance of the rock experience to a number of music lovers; especially, perhaps, those considering a purchase in the lower realms of the price range covered by the article, which includes the PN8+. We certainly did take great pains in the design of the PN8+ to ensure that its performance also does true justice to this aggressive musical genre, as well as accurately conveying the perhaps more natural characteristics of musical selections less dependent upon electronic signal manipulations.

Regarding the removal of the grillecloth entirely during TJN's individual session, and the generic grille used for all panel sessions in place of each speaker's original grille, we note the following: The grillecloth used for the PN8+ is an integral part of the system's design. Cloths used in the industry vary greatly in their acoustical and tactile properties. Some are more or less transparent, resilient, durable, cleanable, etc. The PN8+ grillecloth acoustically provides a kind of "atmosphere" through which the tweeter's output, in particular, must pass. The grille's acoustic resistance in the range of "sibilance-sensitive" frequencies helps diffuse and tailor the driver's output for optimal tonal balance. This filtering effect is accommodated by the crossover design. If not for the grille's notable contribution to the overall balance of high frequencies, the heart of the treble-range output would be 1–2dB too high. This is consistent with the fatigue over time registered by TJN when listening for extended periods without the grille. It also helps explain TJN's stated slight preference for the PN8+'s performance during the panel sessions compared to his personal one, during which the grille was removed. We, of course, respect and understand the rationale behind using a common screen for all speakers in place of the individual grilles for the panel sessions. We know that the PN8+'s response was probably changed slightly by this procedure, but so were all contestants subject to a similar margin of error, so the panel's work, in our view, was quite fair. Perhaps in future sessions, an exceptionally acoustically transparent (available at the expense of durability, which is not a concern for the test conditions) cloth can be used over all subjects while their original grilles are left intact.

Again, we wish to thank the *Stereophile* staff for including our model PN8+ in its adventurous pursuit of those mystical qualities that somehow transform assorted cones and domes into audible vehicles capable of astonishing emotional transport.

RICHARD L. ROTHENBERG
Designer, President, Pinnacle Loudspeakers

KEF Q60 LOUDSPEAKER

Editor:

Thank you for the galley on the marathon speaker panel review involving the KEF Q60. We have never had one of our less expensive models reviewed by *Stereophile*, so we were pleased to have the opportunity and curious to see what the reception would be. To do so in a blind test is even more interesting.

KEF is pleased indeed with the positive comments and overall test scores from the panelists. The only criticism that was consistently raised was slight aggressiveness in the mid- to upper frequencies. As Tom Norton appropriately pointed out, these are boundary-balanced designs, intended to be placed near a wall. Our view is that bookshelf speakers are most often used this way, so we balance it for optimum response near a boundary. The speakers in the test were "placed well away from nearby walls," so we believe this would vindicate the Q60s in those instances.

PETER HOAGLAND
President, KEF Electronics

SPICA SC-30 LOUDSPEAKER

Editor:

Aren't double-blind panel tests fun? Just kidding! Actually, it seems like it was quite a marathon undertaking, and I am impressed with the thoroughness of your procedures throughout. And, of course, I am pleased with how well our SC-30 fared; I only wish that the version with the revised woofer had been used in the panel

tests—oh well.

When RH asked me on the phone what my design goals were for the SC-30, I replied that it was to try to get a quart of liquid out of a pint jar; that is essentially the challenge of designing an inexpensive speaker system.

JA noted a "wrinkle" in the impedance curve at 300Hz. I agree that it is related to the mid-bass coloration noted, but it is a fault of that old woofer more than a box resonance. It shows up in free-air testing, too, and is a nonlinearity in the spider. When he measures the latest version, he should find that the new woofer is free of it.

Oh, and about that sabbatical that I am on: Apparently, "audio nerdism" (great phrase!) is a condition not easily shaken; I have decided to keep one foot firmly planted in the audio world while investigating future horizons.

JOHN BAU
President, Spica

BLACK DAHLIA LOUDSPEAKER

Editor:

RL kindly asked me to provide a "Manufacturer's Comment" regarding the Black Dahlia. Let me, however, first dispel the notion that I'm a manufacturer. I'm not. I have no commercial ties to any of the Black Dahlia vendors and receive no royalties from its sale. Yes, the Black Dahlia is my brainchild, but it was offered as a public-domain DIY project for the benefit of audiophiles without fat bank accounts.

As RH described, the current version differs in two respects from the original design. The double-walled enclosure considerably enhances bass response via improved structural rigidity and damping of panel resonances. The original design had almost unbounded depth. Unfortunately, the prototype that participated in the Listening Panel tests looks like a Black Dahlia on steroids, its front baffle being too wide for fleshing out soundstage depth. The new enclosure available from Just Speakers maintains a narrow perspective, essential for developing a convincing illusion of depth. The foam cover for the front baffle was a last-minute experiment. And while the speaker measures better with it, early reflections from the foam reduce midrange transparency.

Second, the crossover network for the tweeter underwent a minor change. To update the network, replace the 6 ohm series resistor with a 5 ohm/10W value.

Being on this side of the fence is surely a weird experience. The world of audio reviewing makes less sense from over here. I feel like Alice must have felt when she slipped through that rabbit hole into Wonderland. If the truth be known (with the results in front of me), on that particular Sunday I simply despised my

own creation. I rated the Black Dahlia so low that I considerably slanted its final average score; it would have been much better off without me on the panel. With the digital program material and solid-state amplification I was "forced" to listen to, my strategy was to reward those speakers that made the sound most palatable.

DICK OLSHER
Los Alamos, NM

UNITY AUDIO FOUNTAINHEAD SIGNATURE LOUDSPEAKER

Editor:

About a third of the way into Sam Tellig's [April 1992] column, he says, "What I love most about Russians is how they give one another a hard time. No one is more guilty of this than I." In response to Sam's column, "What I love most about Sam is that he brings great fun to audio."

When I "got into" audio about 15 years ago—let's see, that was around 1977—audio was really FUN! Maybe I'm just missing it somehow, but for the past several years things have gotten awful serious. But getting back to Sam...

Sam has fun with audio. He has a reputation of, at times, evaluating equipment hastily—both positively and negatively. He also admits his guilt in giving Russians—and I will add to that, "audio people"—a hard time. But he is a dedicated hobbyist (who, by the way, has one razor-sharp sense of humor); impatience is a common vice among people who are passionate about their hobbies.

He was very impressed with the bass and the tonal balance of the Fountainhead Signatures, but goes on to say that "the soundstaging and imaging, while good, could be better." He also comments that others among his friends disagree. It is the prevailing attitude among Unity Audio lovers, and it is our feeling at Unity Audio, that the Fountainhead Signature's greatest strength is in this area. We believe that the speakers are simply unmatched in the areas of imaging and three-dimensionality. For some reason, Sam apparently didn't have that reaction.

I have met Sam only once in person. He said something to me that greatly impressed me about his role as an audio reviewer: "I don't take the attitude of telling people what to buy. They need to go out and listen and make decisions based on their own ears. I like exposing them to products that I merely think are worthy of their consideration." He does so in a way that is very enjoyable to read. It brings back the good old days of audio. KATHY GROST
Marketing Manager, Unity Audio

DIY LOUDSPEAKER

Editor:

As designers of one of the DIY loudspeakers reviewed in Vol.15 No.3, Alex Thornhill and I would like to add our thanks to those of Arthur Rosenblum at A&S for the generous amount of time and effort put into the review. The comments were invaluable, the data was a feast, and to see our baby on the cover of *Stereophile* was a great moment for us. It made a big difference to have *Stereophile* at the Sound-Off, and we hope you will be there again next year.

The DIY segment of the speaker market seems to be a vital and growing one. We think this is a good sign for the entire audio industry. *Speaker Builder* magazine offers many valuable articles for the speaker hobbyist, and those twisted individuals who'd like to learn more about rolling their own should try a subscription.

We'd like to add a comment or two in response to the review. Amateur builders generally don't have the luxury of matching driver and crossover components; we pretty much have to work with what comes out of the box. That companies like Eton, Focal, and Morel can supply components of consistent quality is a great convenience for us, and no trivial accomplishment. Look at the grief it caused Nelson-Reed when their 8-04/CM system, reviewed in the same issue as the Sound-Off winners, used woofers just 0.5% out of spec.

Alex and I got into experimenting with transmission lines about two years ago, much to the joy of the American particleboard industry. The design of the Sound-Off winner was highly experimental, which makes *Stereophile*'s measurements of the system doubly rewarding. The speakers you tested weren't totally finished; doing so would have made them too heavy to ship via UPS. The cost of shipping both ways by truck would have exceeded an uncertain prize!

Finishing includes filling the triangular voids with sand, covering the sides and top with ½" oak-veneer plywood fastened with flexible adhesive, and applying acoustically absorbent materials to the front and rear baffles. These steps knock down the resonances mentioned in the review more than 12dB. Mounting the speakers with gaskets, which in our rush we forgot to do, also diminishes resonances.

To close, we'd like to thank Art Rosenblum and the staff at A&S, in particular Brian and Bruce, for all their help; the judges—Ken Kantor, Keith Johnson, and *Stereophile*'s own Corey Greenberg (yes, duuude, being least worst is very satisfying)—and lastly JA for what must have been many hours of effort. It meant a lot to us. The Sound-Off experience was nothing but fun from start to finish.

ROBERT J. SPEAR
ALEX F. THORNHILL
Accokeek, MD

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Palo Alto
Audible Difference
805 El Camino Real
Western Audio Imports
4191 El Camino Real
Pasadena
Canterbury Records
805 E. Colorado Blvd
GNP Audio Video
1254 E. Colorado Blvd
Reseda
Variety Newsstand
18456 Sherman Way
Riverside
Speaker Craft
1650 Seventh St
Roseville
Dimple Records
1701 Santa Clara Dr
Rowland Heights
Audio Best
2411 S. Joel Dr
Sacramento
Audio FX
3019 D St
Paradyme Audio/Video
1720 Fulton Ave
San Diego
Stereo Design
9353 Clairemont Mesa Blvd
Stereo Unlimited
3191 Sports Arena Blvd
San Francisco
America's Legal Bookstores
360 Golden Gate Ave
Sounds Alive
731 Florida St
Stereo Plus
2201 Market St
Ultimate Sound
141 Kearny St
San Jose
Books, Inc.
420 Town & Country Village
Paradise Sound
860 S. Winchester
San Luis Obispo
Audio Ecstasy
786 Higuera St
Big Music
723 Higuera St
Santa Barbara
Audio Vision #1
612 N. Milpas St
Mission Audio
215 W. Mission St
Santa Cruz
Cymbaline Records
1336 Brommer St #A9
Lenz Arts
142 River St
Santa Monica
Optimal Enchantment
522 Santa Monica (by appt.)
Shelley's Stereo
1520 Wilshire Blvd
Santa Rosa
Sawyer's News
733 Fourth St
Sausalito
Music by Design
107 Caledonia St
Simi Valley
House of Audio/Video
1970-4 Sequoia
Torrance
Stereo Hi Fi Center
22926 Hawthorne Blvd
Tustin
The Digital Ear
13011 Newport Ave #100
Twain Harte
Village Tunes
18711 Tiffeni
Upland
Audio Haven
1937 W. 11th St #G
Van Nuys
Audio Den
15600 Roscoe Blvd
Vernon
Kinergetics
4260 Charter St
Westminster
Upscale Audio
15251 Beach Blvd
West Sacramento
Mts Inc./Tower Magazines
2500 Del Monte Bldg C
Westminster
Audio Today
14306 Beach Blvd
Woodland Hills
Laser's Edge
20929 Ventura Blvd #24
Wilson Audio Video
Entertainment
20044 Ventura Blvd

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A D Systems
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Eads News & Smoke Shop
1715 28th St
Listen Up
2034 E. Arapahoe
Stereo-Image
1939 Pearl St
Colorado Springs
Listen Up #3
230 N. Tejon
Sound Shop
528 S. Tejon
Denver
Listen Up #2
999 S. Logan St.
Second Sound
1875 S. Broadway
Sound Hounds
1575 S. Pearl
U.S. Tech
111 S. Madison
Englewood
Gold Sound
4285 S. Broadway
Fort Collins
Ovation
236 S. College
Westminster
Westminster Newsstand
5088 W. 92nd Ave

CONNECTICUT

Bristol
Sound Unlimited
169 Church St
Danbury
Carston Stereo
146 Old Brookfield Rd
Middleton
Madrigal Audio Lab
2081 S. Main St
New Haven
Take Five
105 Whitney Ave
New London
Roberts
90 Bank St

FLORIDA

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Rising Sounds
28901 US 19 N.
Fort Pierce
Sound Insights
2302 S. US #1
Fort Lauderdale
Audio Center
4134 N. Federal Hwy
Hollywood
Hollywood Sound
523 S. 21st Ave
Jacksonville
House of Stereo
3505 Southside Blvd #10
Madeira Beach
Book Nook of Madeira
15029 Madeira Way
Miami
Audio by Caruso
13831 S. Dixie Hwy
Audio Plus
6214 S. Dixie Hwy
Disctronics Corp.
2315 NW 107th Ave
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Sound Components
11927 S. Dixie Hwy
Tampa
Audio Visions South
3953 W. Kennedy Blvd

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Music Audio
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1253 Powers Ferry Rd
Martinez
Stereo Shoppe
104 Chamilla Ave
Tucker
Audio Solutions
4880 Lawrenceville Hwy

HAWAII

Honolulu
Audio Direction
3184A Waialae Ave

ILLINOIS

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Stereo Images
718 W. Northwest Hwy
Champaign
Glenn Poor's Audio Video
114 W. Church
Record Service
621 E. Green St
Chicago
Sound Choice
928 W. Diversey Pkwy
Superior Audio Systems
833 N. Milwaukee
Evanston
Chicago Main Newsstand
860 Chicago Ave
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Waiden Books
4279 W. Rt 84
Murphysboro
Sabin Audio
1313 South St
Peoria
Sound of Peoria
105 E. Arcadia
Rockford
Absolute Audio
4227 Maray Dr
Saint Charles
Audiophile of St. Charles
411 S. Second St
Schaumburg
Hi Fi Hutch
879 S. Roselle Rd

Springfield
King's Stereo
225 Highland Ave

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Indianapolis
Tone Studio
820 E. 64th St
World Record Shoppe
5218 Keystone Ct
Ye Olde Hi Fi Shoppe
824 E. 64th St

IOWA

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Sound Environments
2304 Spruce Hills Dr
Davenport
Audio Odyssey
1718 E. Kimberly Rd
Des Moines
Audio Logic
5733 Urbandale Ave
Iowa City
Hawkeye Audio
401 S. Gilbert St

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Wichita
Compact Disc Center
7825 E. Harry
Custom Sound
830 S. Hillside

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Chenoweth Plaza

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Audio Specialties
711 Jefferson Hwy
New Orleans
Octave's Super Newsstand
112 University Pl
Wilson Audio
8001 Maple St
West Monroe
The Orbit Exchange
2324-A Cypress St

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Kennebunkport
Record Rendezvous
6 York St

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Playing by Ear
5615 Belair Rd
Record Masters
711 W. 40th St
Soundscape
406 W. Cold Spring Ln
Burtonsville
JS Audio
15454 Old Columbia Pike
Ellicott City
Gramaphone
9005 Chevrolet
Kensington
Soundworks
10534 Connecticut Ave
Laurel
High Tech Service
& Exchange
14209 Baltimore Ave
Lutherville
Gramaphone
10801 Tony Dr
Rockville
Absolutely Sound!
833 E. Rockville Pike
Silverspring
Capitol Classics Newsstand
14446 Layhill Rd
Towson
An Die Musik
One Investment Pl,
Annex Bldg

MASSACHUSETTS

Boston
Looney Tunes Records
1106 Boylston St
Cambridge
Briggs & Briggs
1270 Massachusetts Ave
Looney Tunes II
1001 Massachusetts Ave
Q Audio
95 Vassar St
Everett
Everett Music Shop
30 Norwood St
Framingham
Natural Sound
401 Worcester Rd
North Dartmouth
Sound II
576 State Rd
Northampton
Sound and Music
351 Pleasant St
Peabody
Clearly Audible
255 Andover St
Pittsfield
HBS Stereo Systems
237 First St
Salisbury
Tape World
E. Main St
Worcester
O'Coin's
239 Mill St

MICHIGAN

Ann Arbor
S.K.R. Classical
539 E. Liberty
Dearborn
Almas Hi-Fi Stereo
15031 Michigan Ave
East Detroit
Audio Illusions
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East Lansing
Jemstone Audio
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Lansing
Contemporary Audio
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Rochester
Audio Video Systems
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Keith Audio Group
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St. Louis
Best Sound Company
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Flip's Stereo Place
9556 Watson Rd
Great St. Louis Sound Co.
1341 S. Lindbergh #1

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Stereo West
7425 Dodge St

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C&M Custom Home Audio
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4449 W. Flamingo Rd
Tiger Tech
1550 E. Tropicana Ave
Union Premiums
1325 E. Flamingo Rd
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High End Stereo
959 W. Moana Ln

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Audio Ensemble
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Hi Fi Connection
RD 1, Rt 73
Millburn
Professional Audio
Consultants
182 Essex St
Morristown
Sight & Sound
60 Speedwell Ave
South Street Stereo
20 South St
Northfield
Sound Inc.
900 Tilton Rd
Nutley
Deboer
113 E. Centre St
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Woodbridge Stereo Center
Princeton Forrestal Village
127 Village Blvd
Ridgewood
Sounding Board
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Trenton
Hal's Stereo & Video
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Stuart's Audio
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Hudson's Audio Center
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Page One Newsstand
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Downtown Subscription
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Galisteo News
201 Galisteo St
Garcia Street Books
376 Garcia St
Rare Bear
1303 Cerrillos Rd

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Stuyvesant Plaza
Binghamton
JSG Audio
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Buffalo
Speaker Shop
3604 Main St
Great Neck
Discriminating Ear
937 Northern Blvd
Jamaica
Raf HIFi/Stereo
JFK Airport, Bldg 80
Lake Grove
Audio Den
Smith Haven Plaza
2021 Nesconset Hwy
Lake Ronkonkoma
Record Connection
484 Hawkins Ave
Latham
Clark Music In Albany
1075 Troy Schenectady Rd
Liverpool
Audio Excellence NY
4974 Alexis Dr
Signature Sound
8409-B Shallow Creek Rd
Lynbrook
American Audiophile
Trading Corp.
373 Sunrise Hwy
Merrick
Performance Audio
2064 Sunrise Hwy
Mount Kisco
Accent on Music
175 Main St
Fox & Sutherland
15 S. Moger Ave
Nanuet
Eardrum Audio & Video
148 E. Rt 59
New York
Dina Magazines
270 Park Ave S.
Electronic Workshop
10 E. 8th St
J&R Music World
23 Park Row
Lyric Hi-Fi
1221 Lexington Ave
The Magazine Store
30 Lincoln Plaza
Park Avenue Audio
425 Park Ave S.
Sound By Singer
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Patchogue
Square Deal Radio
& Television
456 Waverly Ave
Pleasantville
Audio Excellence
343 Manville Rd
Rochester
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Esoteric Sound Systems
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Superior Sight & Sound
2780 Erie Blvd E.
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Advanced Audio
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495 MSBG Cent Rd
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Stereo Lab
4582 Montgomery
Stereo Lab #1
11419 Princeton Rd
Cleveland
The Sound Resource
12621 Larchmere Rd
Columbus
For The Record
1386 Grandview Ave
Needle in a Haystack
2384 Wellesley Ln
Progressive Audio
1764 N. High St
Stereo Lab
2244 Neil Ave
Fairborn
Audio Etcetera
2616 Col. Glenn Hwy
Findlay
House of Hindenach
830 N. Main St
Lakewood
Play It Again Sam
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Lyndhurst
Hi-Tech Hi Fi & Video
5280 Mayfield Rd

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Boogie Records
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Jamiesons'
5431 Monroe
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Atlantis Home Entertainment Systems
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Audio Dimensions
10407 N. May Ave
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It's A Classic
4423 E. 31st St
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4715 E. 41st
The Phonograph Ltd.
5150 S. Memorial #H

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Northwest Audio Labs
1557 NW Monroe
Portland
High Fidelity Unlimited
1428 SE 36th Ave
Sixth & Washington News
617 SW Washington St

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15 W. Lancaster Ave
Berwyn
Soundex
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Erie
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1550 W. 26th St
Harrisburg
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Jenkintown
The Stereo Trading Outlet
320 Old York Rd
Kingston
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569 Pierce St
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Chestnut Hill Audio
149 N. Third
Sound Service Company
8010 Bustleton Ave
Pittsburgh
Audio Options
5824 Forbes Ave
Mook's Audio
3047 W. Liberty Ave
Selinsgrove
Stereo Shoppe
19 N. Market St
Willow Grove
Soundex
1100 Easton Rd

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Hato Rey
Nova Electronics
Calle Guayama de Leon y Muñoz Rivera
San Juan
Novo Audio
Covadonga 104 #300

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Sound Advice
2821 Ashland Rd
Greenville
American Audio
597 Haywood Rd
Rock Hill
Record Cellar
Rock Hill Galeria
2301 Dale Lyle Blvd #192

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Knoxville
Hi Fi House
8373 Kingston Pike #900
Memphis
Underground Sound
2125 Central Ave
Nashville
Cumberland Audio
4119 Hillsboro Rd
Nicholson's Stereo
115 19th Ave S.

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Off The Wall Records
1509 S. 14th St
Amarillo
Don's Hi-Fidelity
7402 W. 34th St
Sound Systems
2502 Paramount
Arlington
Texas Audio
4211 S. Cooper #111
Austin
Audio Systems
3800 N. Lamar
Cochran Corp.
2830 Real St
Dallas
Audio Insight
13929 N. Central Expwy #G441
Krystal Clear Audio
4433 McKinney Ave
Omni Sound
19120 Preston Rd
Preston Trail Audio
17194 Preston Rd #159
Shakespeare Beethoven Galleria #3200
El Paso
Soundquest
6800 Gateway E. #10
Houston
Audio Concepts
2200 Southwest Fwy
Esoteric Ear
13158 Veteran's Memorial Pkwy
The Groove Audio Video
2624 Westheimer
Lubbock
The Sound Wave
Salem Village
4601 S. Loop 289 #13
Mesquite
MJM Audio
1515 Towne E. Blvd #197

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Salt Lake City
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South Burlington
Audio Den
100 Dorset St

VIRGINIA

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Needle In A Haystack
Ballston Metro Center
901 N. Stuart St
Centreville
Gifted Listener Audio
5720 Pickwick Rd
Falls Church
Audio Buys
5177 Lisberg Pike
The Sound Exchange
228 W. Broad St
Richmond
Audio Art
2215 Broad St
Virginia Beach
Digital Sound
6477 College Park Sq

WASHINGTON

Bellevue
Eastside Daily Planet News
156600 NE Eighth #33
Hawthorne Stereo 2
13107 Northup Way
Port Townsend
Quimper Sound
901 Water St
Seattle
Bulldog News
4208 University Way NE
Definitive Audio
6017 Roosevelt Way NE
University Bookstore
4326 University Way NE

WEST VIRGINIA

Morgantown
Sound Investments
467 High St
South Charleston
Absolute Sound
4008 MacCorkle Ave

WISCONSIN

Cudahy
Cudahy News & Hobby
4758 S. Packard Ave
Glendale
Sound Investments
2500 W. Silver Spring Dr
Madison
University Audio
402 S. Park St
Wisconsin Rapids
Salon I
2551 Eighth St S.

CANADA

National Distributor
DeWinton, Alberta
Ruehle Marketing
Box 24, Site One, RR1

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Calgary
The Boutique of Sound
1333 Eighth St SW
KW Audio
344 17th Ave SW
Loyalty Sound
1107 Eighth St SW
Sounds of Music
220 Seventh Ave SW
Edmonton
Audio Ark
10746A 124th St
Audio Plus
9934 82nd Ave
Medicine Hat
Sounds Fantastic
222 S. Railway St SE

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1105 Austin Ave
Kelowna
K&A Audio
453 Bernard Ave
Richmond
Book Warehouse
6340-9 No.3 Rd
Vancouver
Book Warehouse
632 W. Broadway
1150 Robson St
Sikora's Classical Records
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The Soundroom
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Sweet Thunder Records
575 Johnson St

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Creative Audio
214 Osborne St S.

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Halifax
Atlantic News
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Concord
Audio One
3200 Steeles Ave W.
Essex
Audio Two
5 Frances Ct
Hamilton
McMaster University Bookstore
1280 Main St W.
Thompson's Select Audio
610 Upper James St
Village Audio—Westdale
1059 King St W. #2
Kingston
House of Sounds
277 Princess St
Vern Napier's Cameras
333 Princess St
London
Multimag
150 Oundas St #3
Mississauga
Laserland
2200 Oundas St E.
North Bay
Popular Audio
144 Main St W.
Oakville
Oakville Audio
2347 Lakeshore Rd W. #3
Ottawa
Distinctive Audio
903 Carling Ave
Euphonics Audio & Video
685 Bank St
Stereo Trading Post
242½ Bank St
Peterborough
The Audio Room
300 George St N.
Rexdale
Audio Empire
1003 Albion Rd
Richmond Hill
American Sound
9108 Yonge St
Sudbury
Total Sight & Sound
818 Barrydown Rd
Thornhill
Stereo Factory
7616 Yonge St
Timmins
Professional Sound
175 Third Ave
Toronto
Brack Electronics
69 Front St E.
Disticor
155 Gordon Baker Rd #213
Great National Sound
615 Queen St W.
L'Atelier Grigorian
70 Yorkville Ave
Toronto Home of Audiophile
71 McCaul St #E8/E9
Waterloo
Soundstage
59 Regina St N.
Whitby
Whitby Audio Video
233 Brock St S.

QUEBEC

Anjou
Son-Or
7339 St-Zotique
Montréal
Opus Audio
5181 boul. Décarie
Québec
C.O.R.A.
131-18 Rue E
Ste-Foy
ROTAC électronique
2873 Chemin Ste-Foy

AUSTRALIA

National Distributor
Hawthorne, 3122 Victoria
Audio Q Imports
544 Burwood Rd, 1st Floor
Pirimai Hi-Fi & Video
Westfield Shopping Town #54
Burwood Rd, Burwood
Melbourne, Victoria
McGill's Authorised News
187 Elizabeth St

AUSTRIA

National Distributor
Vienna 1150
Sound Unlimited
Diefenbachg. 54/10

BELGIUM

B-3500 Hasselt
Ghijsens Hi Fi Collection
Sint Truidersteenweg 12-14

BERMUDA

Hamilton
M&M International
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CROATIA

Split 58000
Media Audio
Trogirskih Zrtava 1

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National Distributor
Graestad
Matrix
Bylyngen 4, Blistrup
Copenhagen
Hi-Fi Entusiasten
Tagensvej 162
KT Radio
Vesterbrogade 179-181
Aalborg
KT Radio
Noerregade 19-21
Aarhus
Cilfa Hi-Fi
Ny Munkegade 65
KT Radio
M.P. Bruunsgade 36

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National Distributor
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Audio International
Gonzenheimer Str 2b

GREECE
National Distributor
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6 Sivitanidou St
176 76 Kallithea
Musicompact
293 Kifissias Ave
Crete
Audio & Visual Co
3 Zografou St
Thessaloniki
Audio Hall
2 Delliou St

HONG KONG
The Sound Chamber
Dina House #1001
11 Duddell St
YK Audio Ltd.
Room 203, Man Yee Bldg.
60 Des Voeux Rd
YK Audio Ltd.
248 Ocean Terminal
Kowloon

IRELAND
National Distributor
County of Dublin
Cloney Audio
55 Main St Blackrock

ICELAND
National Distributor
125 Reykjavik
Steini HF, S. Danielsson
Skulagata 61

ITALY
Lucca 55100
Sound & Music
Via Mazzarosa 125

JAPAN
National Distributor
Tokyo
AXISS Corporation
210 New Kokusai Bldg
3-4-1 Marunouchi,
Chiyoda-Ku

MALAYSIA
National Distributor
60000 Kuala Lumpur
The Sound Stage Sdn Bhd
10 Jln Tun Mohd Fuad
2 Taman Tun Dr Ismael

MEXICO
National Distributor
Mixcoac 1384
Mexico 19, DF
Diseño Activo, SA
Blvd Adolfo Lopez Mateos

NETHERLANDS
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Tannoy Netherlands
Ezelsveldlaan 52
Amsterdam
RAF HiFi Stereo
Rijnstraat 142-150

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Petone, Wellington
D.R. Britton
3 Sydney St

SINGAPORE
National Distributor
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1 Coleman St
#04-40/45 The Adelphi
Singapore 0617

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Seoul
Korea Electronics
C.P.O. 1369

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Sarte Audio Elite
Padre Jofre, 22

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National Distributor
Stockholm 11438
HiFi Art
Grev Turegatan 24

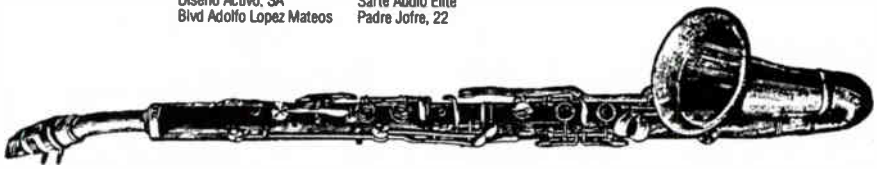
SWITZERLAND
Geneva
Hi-Fi Portier
11 Rue Verdaine

TAIWAN
National Distributor
Taipei
Audio Vertex
4F No.2 141 Ln
Chung Shan N. Road Sec. 7

THAILAND
Bangkok
Focal
207 Bangkok Bazaar
Rajadamri Rd
Future Land
Amarin Plaza, 3rd Fl
Pleonchit Rd
Pathumwan, Rumpinee
SM&M Marketing Co.
Peninsula Plaza, 3rd Fl
153 Rajadamri Rd

UNITED KINGDOM
National Distributor
Wilstead, Bedford
Moth Marketing
10 Dane Ln
Glasgow G2
Music Room
98 Bath St
London
Audio T
190 West End Ln
Douglas Brady Hi Fi
18 Monmouth St
Covent Garden
KJ Leisuresound
26 New Cavendish St
Manchester
Music Room
50 Bridge St
Reading Berks
Reading Hi Fi
Harris Arcade, Friar St

WEST INDIES
JAMAICA
Kingston
Dataline Equipment
& Supplies
10 Braemar Ave #10



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THE FINAL WORD

One of *The New Yorker*'s elements of genius is its ability to persuade you to read about subjects in which you have no interest; to wit, Bill McKibben's "Television" (March 9, 1992; excerpted from *The Age of Missing Information*, Random House). On May 3, 1990, McKibben recorded 2000 hours of television off the cable service in his Fairfax home. He spent the next year and a half watching those 2000 hours and writing about the meditations they inspired, particularly as they contrasted with 24 hours he spent at his house in the Adirondacks.

McKibben's memorable conclusion is that our current "Information Age" is not necessarily anything of the sort. We have huge quantities of information which are of limited use and almost impossible to act on, while at the same time we're deprived of, or ignore, much information commonly available to ordinary individuals in earlier times (like the first half of this century).

McKibben's article inspired much reflection on my part about the nature of the audiophile's search for excellent reproduced sound. If *Stereophile*'s writers are at all typical, an audiophile is constantly searching for the next step up. Yes, the Theta Series II D/A processor is great (along with the ARC 20-bit, the VTL, the Stax, and several others), but the Mark Levinson No.30 is better. Sure, the Thiel 2.2s are good speakers, but let's listen to the CS5s. The IRS Betas are impressive, but what about the IRS Vs themselves? A Krell KSA-150 may be a great amplifier, but I really prefer the ease afforded by the KSA-250 or, even better, the MDA-500s (which I'm using at home now to drive the B&W 800s). I'm not saying this is typical of what every *Stereophile* reader actually buys and listens to, but it's typical of what a lot of people *desire*. Audio writers function as surrogates, allowing you to experience through reading what most of you can't experience in real life.

Just after the Winter CES, JA and I added up the retail cost of the gear in his current review system. I was shocked to hear that it totaled about $52,000. John countered that the system *I* had at home—the Krell amps, a Levinson 25S and 26S, Thiel CS5s, Proceed transport, Stax processor, VPI TNT turntable with SME V and AudioQuest 7000 cartridge—probably cost even more, but he was wrong; my system would cost "only" $42,000. The difference came primarily from the $10,000 worth of MIT cable JA was using compared to my more modest $2000 worth of AudioQuest.

Both systems sounded pretty darned good, as well they should. And they weren't overkill, considering the equipment we had on hand for review. (JA was working on a review of the ARC Classic 120; I was embarking on a "Follow-Up" on the Thiel CS5s, and reviews of the Krells and the Levinson preamp.) But where are we going? Yes, it's great to hear how truly excellent reproduced sound can be (while still falling far short of the real thing); and it's not that readers are uninterested in the virtues of these products. But, following on McKibben's argument, what information do we miss while preoccupied with such esoterica?

Wines, like music and great-sounding high-end systems, are ephemeral. They live, and sometimes they die. A tight, astringent Sauvignon Blanc tastes wonderful with certain foods, terrible with others. The most magnificent '82 Bordeaux complements heavier, simple meals, but is completely out of place with subtle flavors or sharply spicy fare. A wine that you love tonight may be just what you don't want two weeks from now. Novice wine enthusiasts (a group from which I have yet to distance myself) frequently want to serve their biggest-and-best wine without realizing that simple-and-well-chosen often is much more enjoyable, and demonstrates far greater artistry.

Somehow we have yet to learn this lesson in audio, although Robert Harley hints at its truth in his response to reader Bob Gash's question about RH's Linn review in this month's "Letters" column. Bigger is frequently not better; more bass is not necessarily better bass; Mahler's symphonies are not inherently greater artistic achievements than Debussy's piano preludes; and a $52,000 system may not satisfy more than a $5200 system. This last is a hard truth for audio writers to grasp, and an even harder one to embrace. **—Larry Archibald**

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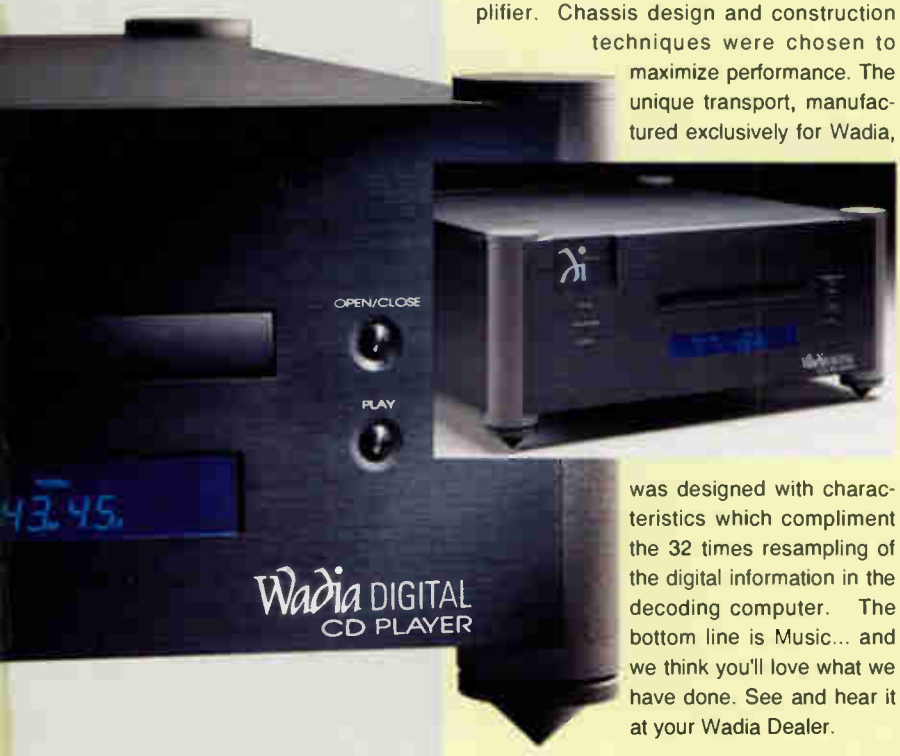

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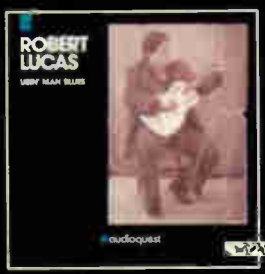

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