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Stereophile, October 1990
First, an apology. I had promised to publish the full results of the CD Tweak listening tests, that were carried out at the New York High End Hi-Fi Show, in this issue. Sorry, folks... for a number of reasons, not the least of which was the sheer editorial work in preparing this largest-ever issue of Stereophile, I was unable to sit down to write them up. They will appear in the November issue.

November will also see Robert Deutsch offering advice on tweaks and tweaking—how to get the best from your system without having to take a second mortgage on the family home; Barbara Jahn recommending definitive recorded performances of that audiophile special, Richard Strauss’s Eine Alpensinfonie; and—finally—the publication of Dick Olsher’s latest DIY loudspeaker project, the Black Dahlia. The Black Dahlia, a modestly sized two-way for which Dick used the latest loudspeaker and crossover-design computer programs, also comes under intense review scrutiny in November.

Other scheduled reviews for the November issue include: Tom Norton on the Mirage M-3 loudspeaker; Bob Harley on digital processors from Meridian and Museatex; Guy Lemco on the Audio Research SP9 Mk.II and Counterpoint SA3000 preamplifiers; Peter Mitchell on budget-priced components; Arnis Balgalvis on the Basis Debut turntable; and myself on the Infinity Modulus and Monitor Audio Studio 10 loudspeakers.

And don’t forget, both the Stereophile Test CD, used by many of our reviewers to reach their subjective value judgments, and the long-awaited CD version of Stereophile’s Poem flute and piano album are now available for just $6.95 and $11.98, respectively—see the ads on pp.93 & 94 for details on how to order.

—John Atkinson
The Cryogenic Compact Disc

Robert Harley

Just when you thought it was safe to put green paint around the edges of your CDs without ridicule, there’s yet another CD tweak that’s sure to bring howls of laughter from the skeptics: cryogenically freezing CDs. They won’t be laughing for long, however, when they hear for themselves the sonic results of this process.

Ed Meitner, designer of the Museatex line of electronics, has discovered that freezing a CD changes the physical structure of polycarbonate, the plastic material from which CDs are made. The result is reportedly an audible improvement in sound quality. In this process, CDs are placed in a cryogenic freezing chamber and the temperature is slowly reduced over eight hours to 75° Kelvin, or about –300° Fahrenheit. This is approximately the temperature of liquid nitrogen, the chamber’s cooling agent. The temperature is then slowly brought back to room temperature over another eight hours.

This technique reportedly relaxes the lattice structure of a material (polycarbonate in the case of CD) that has been previously distorted by heat or pressure, both of which are present during CD injection molding. By reducing the molecular bonds holding the material together, the internal stress in the material is reduced, thus changing its resonant characteristics. Indeed, a treated disc feels slightly more flexible than an untreated disc.

But how could freezing a CD possibly affect its sound quality? So what if the polycarbonate has a different structure? The data are all ones and zeros. Furthermore, uncorrected data errors are almost nonexistent in most discs without treatment, ruling out improved data integrity as an answer. I posed these questions to Ed Meitner and got the following explanation.¹

Mechanical vibration of the disc causes the HF signal to become noisy and have excessive jitter. The HF signal is the raw signal output from the CD player’s photodetector.² By freezing a CD, the disc’s mechanical resonance is lowered, improving the quality of the HF signal retrieved from the disc. Although theory states that noise and jitter in the HF signal will have no effect on sound quality—the HF signal is squared, buffered, decoded, filtered, and clocked out of another buffer with quartz-crystal accuracy—many digital designers main-

1 Please note that in this article I merely relate the explanations of physical phenomena as described by others. I do not necessarily subscribe to the views presented.

2 See my article "CD: Jitter, Errors, and Magic" in Vol.13 No.5 for an explanation of how data are retrieved from a CD.
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tian that HF signal quality does affect the sound. Ed Meitner claims that the HF signal improvement from a cryogenically treated disc is easily measurable. I looked at the HF signal on an oscilloscope from the Esoteric P2 transport with treated and untreated discs. I could see no difference in the signal quality. However, it is very difficult to make comparisons without seeing the two HF signals side by side.

Meitner is talking to some audiophile labels about mass-treating their releases. Apparently, the process is efficient and economical, with the ability to treat thousands of discs at once. Liquid nitrogen, which doesn’t come in direct contact with the CDs, is inexpensive and readily available. Interestingly, this process is said to yield similar sonic improvements with a vinyl phonograph record. In addition to CDs and LPs, the process has been used on Laser-Vision-format video discs, speaker cable, interconnects, integrated circuits, and musical instrument strings.

Cryogenic freezing is also used to treat machine tools like drill bits, copper welding tools, and saw blades. The process reportedly improves their wear characteristics, thus extending the tool’s useful life. The treatment doesn’t always work, however, and there is no consensus among metallurgists that the process is always beneficial. In fact, the effects of cryogenically freezing materials is not well understood; little scientific research has been done to explain the phenomenon.

Another tweak developed by Ed Meitner is painting a CD’s top surface black. This reportedly improves sound quality by improving the signal at the CD player’s photodetector. Before describing how this works, let’s look at the playback laser beam’s path through the disc.

The playback beam enters the disc through the surface without the label. It travels through the 1.2mm disc thickness where it encounters pits impressed in the polycarbonate. To reflect the beam back through the disc and to the photodetector, a thin layer of aluminum is deposited on the disc surface, which conforms to the pit structure. A protective coating of varnish seals the aluminum and prevents it from oxidizing. The label is then silk-screened on top of the protective coating.

Ed Meitner contends that several mechanisms are at work that degrade the HF signal picked up by the photodetector. One phenomenon is distortion of the aluminum layer by the laser beam’s heat. Even though the beam is very low-power—about half a milliwatt—it is focused on such a small area (1.5μm) that the aluminum molecules bend, causing the aluminum layer to flex. This introduces jitter in the HF signal as well as noise in the focus signal.

This phenomenon has reportedly been measured by painting black bars on a CD’s top surface (the label side) and looking at various signals. The bar pattern is readily apparent in both the focus servo and HF signals. Painting the CD black reportedly improves the thermal conditions by reducing the contrast in the aluminum molecules caused by laser-induced heat. Another mechanism that is also affected by black paint is the secondary reflection from the disc label. Some laser light passes through the aluminum layer and is reflected to the photodetector by the label. This reportedly causes noise in the HF signal which is manifested as uncertainty in the digital code transitions. Note that the above descriptions are those of Ed Meitner, and have not been independently verified.

How plausible are these explanations? I find some of them hard to believe, especially this last phenomenon. However, there is so much going on in digital audio that we don’t know about—especially the optical considerations in data retrieval from CD—that I hesitate to rule out anything.

What really matters is if these treatments work. Since I believe that the ear is the highest-resolution instrument available to explore these phenomena, I gave Ed Meitner three copies of the Stereophile Test CD for treatment. One disc was cryogenically frozen, another was painted black, and the third was both painted and frozen. The Stereophile Test CD is ideal for this purpose: it has a wide variety of music, all recorded by Stereophile contributors. In addition, I know with absolute certainty that the three treated discs as well as my untreated control disc were made by JVC from the same master tape and CD stamper.

I began by listening to my guitar and bass recording from the untreated disc. After switching to the frozen and painted disc, the difference was immediate and obvious. First, the guitar appeared to become louder, with more

Stereophile, October 1990

5 I refer the interested reader to an excellent article in the June 1988 issue of Popular Science for more information on cryogenic freezing. The piece includes tests on treated and untreated machine tools, with mixed results.
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clarity and detail. Subtle sounds like finger noises and minute instrumental detail jumped forward. The sonic picture became more vivid and immediate. The acoustic bass took on a more rounded character and its musical contribution seemed enhanced. There was a greater degree of air and life around the instruments; they suddenly became more palpable.

The degree to which these characteristics were apparent varied considerably with the type of music. During our annual *Stereophile* writers’ conference in early August, I had an opportunity to play treated and untreated discs for some of the visiting writers. Arnis Balgalvis correctly identified the treated disc in a blind A/B/A comparison when he visited my listening room. He immediately knew that presentation B was different, and his description of the difference was remarkably similar to my impressions.

I repeated the blind test for Peter Mitchell in JA’s listening room; Peter also immediately identified the treated disc. In fact, within seconds of hearing the treated disc with the guitar and bass recording, he let out a loud exclamation of surprise. His impressions were consistent with the differences I had heard, which I related to him after the test and his description to me of the differences.

A good point Peter raised was that although there was clearly a difference, he had doubts about which was “better” or more true to the original recording. The treated disc had a brighter, more detailed character that would exacerbate many of CD’s problems.

The above listening comparisons were made between an untreated disc and one that was both cryogenically frozen and painted black. Further listening of frozen-only discs and painted-only discs revealed that most of the sonic difference was the result of freezing. The black paint, however, did add to the effect. A second frozen and painted disc sent to me by Museatex had similar differences. However, a look at the disc’s inside ring, where the production number is written, revealed that it was a different pressing from my untreated control disc. I would therefore refrain from reaching any conclusions based on this disc. From my experience with the *Stereophile* Test CD, however, I am convinced that some unexplained phenomena are occurring in frozen and painted CDs.

While we’re on the subject of CD tweaks, I mentioned in my article in Vol.13 No.5 (“CD: Jitter, Errors, and Magic”) that a Japanese company called HiBright was making CDs with a proprietary material called Amorphous Poly Olefin (APO) that reportedly offers better sound than conventional polycarbonate. At the time of that writing, I had not heard discs made with this material. However, I now have two copies each of two different discs,4 one made with polycarbonate and the other with APO, but both pressed from the same stamper.

Interestingly, the disc made from APO was smoother and less bright than the polycarbonate disc. This is the opposite reaction I had to the Museatex frozen and painted disc. With the APO disc, female vocal was more open, had more air around it, and was much less sibilant. Although both polycarbonate and APO versions were excruciatingly bright, the disc made from APO was far less annoying. The spitty edge to the voice was greatly reduced, and the presentation took on a more relaxed character. The tonal difference was similar to an equalization change of about 2dB at 10kHz. These impressions were consistent with both disc pairs I auditioned.

A fellow audiophile had a similar experience with pairs of HiBright polycarbonate and APO CDs. He found it difficult to believe that such different-sounding discs could have been made from the same stamper. The difference was so great, he believed that one disc had been equalized. Furthermore, he was highly skeptical that the disc composition could have any audible effect. To verify that the discs were indeed identical (except for the molding material), he sent the discs to a facility to have their data compared to each other. This process is routinely performed on Compact Disc Read-Only Memory discs (CD-ROMs) to assure that replicated discs are identical (down to the last bit) to the source data.

The data comparison revealed that the two discs were, bit for bit, identical to each other. Since the polycarbonate and APO discs have identical data, that is conclusive proof that no equalization or other processing could account for the musical differences. Since they obviously have different sonic characteristics but contain identical data, there are therefore un-

4 They are The V/P Trio, ACB-0003 (APO) and PCB-0003 (polycarbonate) with Cedar Walton, Pat Senatore, and Billy Higgins; and Algeria by Sunny Wilkinson, ACB-7 (APO) and PCB-7 (polycarbonate). Both CDs are on HiBright’s California Breeze label.
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*Continuous power output, 20 Hz-20 kHz < 0.02% THD, measured in accordance with FTC specifications.

II Elkins Road, East Brunswick, NJ 08816 U.S.A. (201) 390-1130 Distributed in Canada by PRO ACOUSTICS INC. Pointe Claire, Quebec H9R 4X5
known phenomena occurring in CD playback not accounted for in textbook digital-audio theory.

Finally, there is one more CD tweak on the horizon, also created by Museatex: abrading a CD's edges and the non-label side surface only where data have not been recorded. This reportedly causes light to be diffracted rather than deflected at the roughened surfaces. Eighty-grit sandpaper is used on the vertical edges, and 200 grit on the read (bottom) surface. I am told that the record label Chandos is working with Swiss CD pressing plant ICM to mold a roughened surface into the polycarbonate during CD manufacturing. Stay tuned.

My fascination with CD tweaks stems not from their intrinsic abilities to improve CD sound as much as it comes from the realization that if any tweak has even the slightest audible effect, conventional digital audio theory is turned upside down. More important, however, the widespread acceptance and belief in CD tweaks may make skeptical engineers listen for themselves, perhaps sparking an investigation into why they work. Such research may lead to fundamental new discoveries in digital audio that will drastically improve its performance. With LPs all but dead, there is an imperative to make digital audio sound better.

Furthermore, I see CD tweaks as a Rosetta Stone to an audio engineering establishment that dismisses the possibility that freezing a CD, or painting it black, or putting green paint around the edge, or making it from a different material, could affect its sound. Because these treatments are considered the epitome of audiophile lunacy and because they are readily audible, some measurement-oriented scientists may, if they listen for themselves, realize that audiophiles are not always the demented mystics they are often accused of being. Consequently, some scientists may decide to turn their considerable analytical skill toward other areas of audio reproduction, long cited by audiophiles as important, that are far less bizarre than freezing CDs.

5 The Rosetta Stone is a basalt slab with the same information inscribed in Egyptian hieroglyphics, Demotic, and Greek. Written in about 200 BC and discovered in Egypt by Napoleon's soldiers in 1799, it provided a means of deciphering hieroglyphics which were previously unintelligible. The Rosetta Stone was the key to understanding the writings of ancient culture and civilization. Just as the Rosetta Stone provided a bridge to understanding a previously unexplored civilization, CD tweaks may break down the barriers between the audiophile and the scientist. We could use a few converts in the quest to make music reproduction less of a black art.
If you ask five different audiophiles which is the best high bias audio cassette to record music on, you’re likely to get five different opinions. But if you ask the Audio Precision Analyzer™ you’ll get a definitive answer, right there in living color: TDK SA-X.

The Audio Precision Analyzer is one of the most sophisticated pieces of laboratory equipment of its kind. It’s used by audio engineers to evaluate an audio cassette’s performance in a variety of areas. Two of the most critical of these areas are MOL (Maximum Output Level) and bias noise, which together are used to measure what is known as dynamic range.

MOL is indicated by the curve at the top of the analyzer’s monitor; bias noise is indicated by the curve at the bottom. The vertical distance between any two points on these curves is the measure of an audio cassette’s dynamic range at that particular frequency.*

The greater the distance, the greater the dynamic range. And the greater...
cassettes (the results of which were published in the March 1990 issue), it utilized an Audio Precision Analyzer to evaluate dynamic range.

What the analyzer told Audio—in no uncertain terms—was TDK SA-X's dynamic range was the widest of all Type II audio cassettes tested. Which makes it the best tape you can use to capture the fortissimos, pianissimos, and transients of today's music sources.

So if you want the most faithful sound reproduction you can get from a high bias tape, look at what the Audio Precision Analyzer is telling you. And listen to TDK.

When *Audio* magazine conducted an exhaustive test of 88 blank audio cassettes (the results of which were published in the March 1990 issue), it utilized an Audio Precision Analyzer to evaluate dynamic range.

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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 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.

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**It’s just not true!**

Editor:  
Hey! It’s just not true! *Stereophile, The Absolute Sound, Hi-Fi Heretic,* and *Hi-Fi Answers [now called* Audiophile—Ed.]* are not the “only audio magazines that formally offer manufacturers the opportunity to respond in print,” as was stated in the July issue of *Stereophile.*

AudioVideo, the hi-fi magazine of New Zealand, also offers manufacturers and importers the opportunity to respond to reviews.  

Mike Jones  
Editor, AudioVideo, Auckland, New Zealand

---

**Musicality vs high definition**

Editor:  
Whatever happened to musicality? “High definition” has taken over as a goal with the unfortunate result (for the listener) that you can hardly concentrate on the music for all the detail, and the fortunate result (for the dealer) that increased resolution in one component only serves to uncover defects in other components which then must also be upgraded.

The concept of musicality, if I recall, was that a high-fidelity system should recreate an experience as close as possible to a live performance: a transparent window. My wife and I are fortunate to attend live performances almost weekly and I have yet to be aware of the sound of a singer’s breathing, the percussion of a piano’s hammer on the string, the exact position of the singer on the stage, or the distance from front to back of the orchestra pit. Yet reviewers extol the virtues of equipment that pushes these irrelevant aspects of music into the forefront of the listening experience.

Are we being had by hi-fi tricks similar to the practice of adding a presence peak in the response curve? Can’t there be too much (false) detail and positional information, just as there can be too much (palpable) presence? Exists there an audacious and knowledgeable reviewer who will criticize excessive definition? Where is JGH when we need him most?

George E. Westlake, M.D.  
Kentfield, CA

---

**MESS vs mess**

Editor:  
As one who has also lost her bathroom to an ever-growing stack of *Stereophile* magazines, I was surprised and amused at the advice Bob Deutsch gave Ms. Schwenk [at the New York Hi-Fi Show; see August “Letters,” p.21] concerning the problem. Surely he was joking in suggesting that only six copies be kept in the little room and rotated regularly from a box in the basement. He, of all people, should know that for anyone in the advanced stages of *Stereophile*-collectivitis, this would simply be asking too much. Or perhaps Ms. Schwenk misunderstood. Maybe he meant that only six copies should be allowed to lie loosely scattered across the bathroom floor—you know, the layered look—while the rest of the colorful hoard is dutifully squashed into the shelves originally (and idiotically) intended for towels.

In any case, after a long and fruitless search for an answer to this perplexing problem, I have finally decided to start a self-help group for the Significant Others of those suffering with this malady. Contact, c/o *Stereophile,* Management of Excessive Stacks of *Stereophile* (MESS).  

Beverley Deutsch  
Toronto, Canada

See also Ms. Linda Tasker (aka Mrs. Kevin Conklin) on the subject of cohabitation with an audiophile, elsewhere in this issue.—RL

---

**Locker-room humor?**

Editor:  
I am writing to express my concern about the July 1990 cover of *Stereophile.*

Obviously, my concern is not with the artwork or style of the design, but with the total inappropriateness of the words used. It may be that “to the pure all things are pure,” but I feel that the very thinly disguised double entendre was very much out of place and in such poor taste that I was surprised that whoever is responsible for the final presentation of this normally attractive magazine would stoop to this level. What passes as humor in bar or locker-room conversation has no place on the cover.
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And experience Research and Development, Infinity style.
of a widely read magazine of this type which is supported, to a large degree, by revenues generated from equipment manufacturers and distributors. How your advertisers project their own company images and the products which they are advertising is up to them. It would seem, however, that Stereophile should accept the responsibility to its own advertisers and avoid this type of public display of extremely poor taste.  

Richard J. Chilvers  
President, TDL Electronics, Stamford, CT

Filthy language & editorial responsibility
Editor:  
When the editor of a publication gets down on the same level as an undergrown adolescent and quotes their obscene, filthy language — that's where we part company. Cancel my subscription. I don't want to ever hear from you again.  
William Plumblee  
No address given

We aren't nothing?  
Editor:  
Your total misunderstanding of the SOTA Panorama speaker, Peter Mitchell's love affair with CD, and JGH's talk about LPs prove what total nincompoops you are. Add Sam Tellig's tweaks that ruin CDs and you aren't nothing compared to The Absolute Sound. LA and JGH should go back to PAT-4s and Dynaco transistors!  
A former reader  
No address given

In answer to Mr. Chilvers' concern about our July cover, I can assure him that as the person ultimately responsible for what appears on covers, I feel the dreadful double entendre is in the eye of the beholder. Regarding our usage of what Mr. Plumblee would undoubtedly refer to as the "F-word" (Vol. 13 No. 7, p. 190), Stereophile's writers don't use profanity; to do so would reveal a lack of vocabulary that would disqualify them from being able to contribute to the magazine at all. On the other hand, I see my editorial responsibility as ensuring writers are true to what is said by people whose activities are being reported on. If someone being quoted has, horrors, used a touch of Anglo-Saxon, it therefore appears in Stereophile if the way they said something is relevant to what they said. Substituting asterisks seems to me to be both coy and fruitless in that every-

one will still read the "obscured" word correctly. I assume that you are all adults, that you have heard such words used by other human beings in stressful situations even if you don't habitually use them yourselves, and that you would recognize the editorial responsibility involved without being offended.  

Regarding the "former reader" who is upset by the presence of contrary opinions to his in these pages, I can only note that he doesn't have the cojones to include his name and address, preferring to hide behind a mantle of anonymity. And if Mr. Plumblee had included his address, we would at least been able to refund his subscription money. —JA

Shocked!  
Editor:  
Every issue of Stereophile, it seems, contains at least one letter from someone who is shocked — shocked — that your publication would have the audacity to:  

1) seriously consider equipment which hasn't already received rave raves in mainstream magazines;  
2) seriously consider equipment which isn't readily available within a half-mile radius of the writer's house;  
3) seriously consider equipment which costs in excess of three digits; or  
4) seriously entertain a controversial or contrarian position on matters audio.  

Who are these people? And what precisely did they expect when they signed up for a high-end audio magazine with the name of Stereophile?  

One gets the distinct impression from these folks that they were forced to subscribe to your publication, sight unseen, by roving bands of magazine commandos.  

Patrick Hudson  
New York, NY

Is there?  
Editor:  
Is there anyone out there besides me? Feels like another planet here.  

John Muteshi  
Nairobi, Kenya

Religion vs science  
Editor:  
We all have deeply held beliefs about audio. Though we adamantly deny they affect our objectivity, our beliefs are an integral part of our listening experience.
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We all know that washing our car couldn't possibly affect the way it runs. But we also know that our car runs better after we wash it. Could there be some unknown connection between the shine of the paint and our fuel injectors, or is the effect only in our minds? But does it really matter? If we perceive that our car runs better when it's washed, then we should wash it and enjoy!

Reality is what we each perceive it to be. Our beliefs shape our individual realities in everything we do, especially something as nebulous and personal as audio. We are each absolutely correct when we believe we are in possession of the audio truth. It is, however, only our own individual truth. There is not, and can never be, a universal audio truth. Accordingly, we must resist the temptation to preach our personal gospel to others or to try to convert them to our own brand of audio religion. We won't succeed and, like all other zealots, we will make dreadfully boorish asses of ourselves in the process.

My point is simple. We should each shamelessly confess the unmistakably religious nature of high-end audio and piously exploit our abundant faith to enhance our listening enjoyment. Through sacred ritual and devout belief we can each approach audio nirvana in our own individual way. If you believe CDs sound better when polished with some mysterious fluid, then for heaven's sake, polish them. If it works for you, what does it matter if there's no explanation? So what if all amplifiers sound alike in double-blind tests? You know a Krell sounds better than a Carver. If you're convinced discrete circuits are better than op-amps or that tubes sound better than transistors, exorcise those unholy devices from your system and be delivered. If you truly believe, I guarantee it'll work.

Religion and science are two very different things. Religion is based on faith and science is based on objective fact. As long as we are human, our beliefs and prejudices will be an integral part of our listening experience. We're really practicing a form of religion, not science. That's okay, just don't confuse the two.

L. Hepinstall
Batavia, IL

"Call me Ishmael..."

Editor:
Dick Olsher's 14-page review of the Ensemble speakers in June was the wordiest piece of writing I've ever read!

Steve Marston
Glen Oaks, NY

Living in the real world

Editor:
Three cheers for Markus Sauer! His "Industry Update" in June convinces me that some audiophiles live in the real world. It is refreshing to see that your authors have concerns which transcend the realm of high-end home audio (ecologically sound high-fidelity?). Articles such as Sauer's, TJJN's "A Matter of Taste" (same issue), and the humorous yet insightful ramblings of the heretical Sam Tellig provide a welcome alternative to the elusive, hairsplitting, technologically obsessed mainstream of audio journalism. Keep up the good work, folks!

On a different note, regarding the subjectivity/objectivity debate (or "everything which exists can be measured") raised in the July issue, I'd like to offer an analogy from the world of physics. Modern physicists acknowledge the existence of neutrinos, subatomic particles which pass through "solid" matter as easily as through a vacuum at close to the speed of light. Until comparatively recently, neutrinos eluded measurement due to their [lack of mass and] enormous speed. In 1956, however, scientists managed to capture a few as they passed the Earth on their journey outward from the Sun. Are we to believe that, prior to their detection, neutrinos did not exist? Would Stanley Lipshitz believe this? I somehow doubt it. Why then must we believe that current measurement techniques reveal the intrinsic nature of an audio component's sound quality?

The performance of live music is, essentially, a four-dimensional experience (musicians playing in three-dimensional space over time). The goal of music reproduction is to capture this four-dimensional reality. How can anyone expect to represent or evaluate this experience exclusively with two-dimensional frequency-response graphs and linearity charts or [uni-dimensional] signal/noise ratios and the like? Listening to music, whether live or reproduced, is a fundamentally subjective experience. As Robert Harley says, it involves excitation of the right hemisphere of the brain, whereas objective, quantitative analysis is primarily a left-brain function. Subsequently, the musical experience, like the human mind itself, defies strictly objective explanation. Of course, objec-
Robert Harley on his friend Michael:
"... willing to fork over a couple of kilobucks, provided the processor provides truly musical performance and isn’t likely to be significantly surpassed at the price anytime soon."

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

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

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

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

tive measurements are necessary in designing and evaluating products in order to determine and correct for gross deficiencies that would otherwise inhibit accurate sonic reproduction. However, in this case, what is "necessary" is not sufficient. Subjective evaluation must be done in order to approach a true understanding of any electronic component.

One might ask who should perform the subjective evaluation: "Whose ears should I trust?" Since perception varies from person to person, each individual is his/her own best judge. The opinions of others, particularly those with experience in the field, are important. They help to rule out non-contenders, thus narrowing the competition. But the final decision of what is "musically accurate" must be made by each individual. In other words, do what Stereophile has always told you to do: don't take their word for it, listen for yourself.

Christopher Boylan
New York, NY

P.S. I must say I've lost some respect for Mundial due to their over-reaction to Mr. Harley's review of the Aragon D2A converter. It is unfortunate that some people only value opinions which coincide with their own.

Harley must be kidding!

Editor:
In response to Robert Harley's "Deeper Meanings" article in July—he must be kidding! If I were to spend 20 grand on a so-called "high-end" system, it'd better sound like a 20-grand system even if I were standing in the street with doors and windows shut. If I couldn't tell the difference between this system and a mid-fi system—each and every time, eyes closed, blindfolded, standing on my head, whatever—I would feel ripped off!

M. DeSouza
Destin, FL

Mr. DeSouza's succinct epistle—I can't help but think he failed to grasp the thrust of Robert Harley's thesis—and Christopher Boylan's more considered piece were but the first in an onslaught of letters I received responding to points made by Bob in his July "As We See It" column. These letters will appear in November's "Letters" column. —JA

Copyright & a long memory

Editor:
Do I get residuals for playing in the 1948 High School Band whose recording was featured on the Stereophile Test CD? I can tell you stories of JGH's appearance in the US and of my introduction to hi-fi. In fact, I still have a schematic he wrote out in 1946 or '47 for me.

I was an original subscriber and have every issue up to several years ago, when the bounds of equipment costs got out of hand. Nonetheless, keep up what some see as a real need.

Dr. Pierre Marteney
Manchester, CT

Copyright & journalistic balance

Editor:
As a composer, I am writing to protest the unchecked, completely one-sided presentations appearing in issue after issue of Stereophile concerning the question of DAT recording, Copycode, and related matters. It should not be left to readers who might attempt to add some balance to your biased coverage as I am doing herewith, because even intelligent letters to editors, I feel, tend to convey a kind of "suppliant" posture against the implied "authority" of the word as printed by the pros. Rather, I cannot understand why you have not sought informed input from ASCAP (for example), instead of simply allowing Mr. Hannold to imply that his extreme stance comprises all that is right and good on the subject.

The broad principle of copyright protection of intellectual and artistic production has certainly, by this late date, been recognized by most nations which value such artifacts of civilization, and their creators. In most of those other evolved cultures, in recognition that advancing technology has made unlimited unpaid home reproduction of music impossible to log, some form of taxation has been added to the purchase of all forms of blank tape, to be fed back into the arts-producing community, as we seem loath to do here. (But then, most of these societies also do such unthinkable things as taxing themselves to maintain national symphony orchestras, opera and ballet companies, and national theaters.)

Mr. Hannold has been pleased to portray himself and the like-minded as individuals up against the music and/or record industry. Is it really necessary to point out that we who try to earn our way by the use of whatever talents and skills we have are individuals? As in all other forms of endeavor, there are a few at the

Stereophile, October 1990
Your ears are acute enough to hear the ultimate reproduction that your system is capable of delivering. But does your system deliver? It won’t if you overlook one of its most important components, the interconnects.

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top who have achieved extreme success and concomitant rewards, but the vast majority of us follow on a continuum, working in whatever style, level of aspiration, and degree of achievement, and relying for a major part of our sustenance on various forms of royalties. To the (admittedly imperfect) degree possible, royalties, gathered from the public through licensing, are distributed in proportions reflecting their enjoyment of the material by logging of performances, as well as by sales, if pertinent.

I seem to remember Mr. Hannold in an earlier issue of Stereophile... implying that he (obviously a veritable Jimmy Stewart/Mr. Smith) was up against those wicked "millionaires in their estates hidden in the verdant Hollywood Hills" (or something close to that) cowering from the justice of his vision. Apparently this would consist of Mr. Hannold, sitting at home after spending his few bucks for one copy, being able to clone endless perfect copies for any extended, repetitive use he might desire, thus, in effect, having the unmitigated nerve to surreptitiously help himself to my property— or, to be more exact, property of which the artistic component is mine, and of which ownership of technical and/or financial aspects may have been purchased by partners who contributed hard-won resources and skills. That, in my opinion, manifests the pathological equivalency of the computer hacker/ geek, who, feeling inadequate to face society, sits hidden away at his terminal, stealing the property and invading the privacy of others.

Presumably, those who read or are associated with a journal such as Stereophile are interested in the art and science of sound reproduction because their minds and spirits are evolved enough to derive emotional, spiritual, and intellectual stimulus from the world’s musics. This makes all the more numbing the realization that within the minds of some of these people there is a shameful vacuum where a sense of ethics and morality should be.

Elliot Kaplan
Woodland Hills, CA

Issue after issue? My work has appeared in only six of the last 27 issues. Yes, all but one of those pieces dealt with the entertainment industry’s war on home taping; but in the other one (Vol.12 No.4, April ’89), I countered a proposal to finance public broadcasting from an excise tax on consumer electronics with a suggestion that it be funded by a tax on broadcast advertising. That elicited protests from some readers who oppose spending any tax money on public broadcasting, let alone on the fine and performing arts. I can’t wait to see how they react to Mr. Kaplan’s letter!

The phrase he couldn’t quite remember was “verdant enclaves of entertainment industry wealth.” The Congressional Quarterly used it to describe Rep. Henry Waxman’s district, as I duly noted (Vol.11 No.12, December ’88, p.101). And if you think using that quote was a gratuitous insult, consider the following example of how that wealth is used in politics:

New Jersey’s Governor James Florio, a member of Congress from 1975 to 1989, chaired the subcommittee that handled the Gore-Waxman Copycode bill. I believe his efforts helped keep DAT off the US market. Subsequently, according to FEC reports, money was transferred to his reelection campaign from the campaigns of three Hollywood-area Democrats—Waxman, Howard Berman, and Mel Levine—as well as from Waxman’s personal PAC. Now it’s not unusual for a powerful Democrat like Waxman to offer that kind of help to a colleague facing a tough challenge; but Florio’s House seat was about as safe as they come. It was widely assumed as early as 1987, however, that Florio would run for governor in 1989, and that he’d need a much larger war chest than his Camden County power base could provide.

In his first six months in office, Florio has raised state taxes, including the sales tax, so drastically that he has made himself the most unpopular governor in recent New Jersey history (despite the puffery you may have read in Time). Still, many liberal Democrats are touting him for President in 1992. Some reward, eh?

But the money and power of the showbiz rich can be neutralized, in most cases, by constituent mail. And that was the only point I made under the heading “Mr. Smith Writes to Washington” (Vol.11 No.6, June ’88). The sections of that article were captioned with parodies of movie titles, and no one who really read it could have got the impression that I was comparing either myself or our readers to “Jimmy Stewart/Mr. Smith.”

Mr. Kaplan’s inferences about me are wrong. I’m neither an antisocial “computer hacker/geek” (why does he use so many

Stereophile, October 1990

23
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It takes a lot of technology to bring you great music.

But the effort is well worth it.
slashes?) nor a DAT owner (in fact, I'm such a confirmed digiphobe that I don't even own a CD player!). And I approve of public funding of the arts.

But I get very angry when limousine liberals like Waxman and Florio try to tax me to further enrich an already wealthy commercial entertainment industry. And I get just as angry when they try to tell me I can't buy something, even when it's something I don't want to buy anyway. The only limitations I will tolerate on the kinds of components in my system are those set by my own taste—and by my budget!

—Jack Hannold

Test CD paranoia

Editor:
Such a deal???

As part of a promotion designed to lure me into subscribing to your publication, I was sent a copy of the Stereophile Test CD. My copy has a small, gold, oval sticker—"Special Subscriber Edition"—on the CD Viewpak.

Naturally I was suspicious. Not paranoid (yet), just suspicious. I filed the CD for future listening.

I received the August issue of Stereophile to find in LA's "Final Word" column mention of "the just-released, corrected version of our Test CD" (emphasis mine).

Now the paranoid little voice began (very distracting): Gee, whaddya suppose they did with all those defective/flawed/irregular Test CDs? Hmmmm? I mean, they couldn't just throw them away, now, could they? That wouldn't be very responsible (environmentally speaking). . . "ad nauseam.

Anyway, if my paranoid delusions are, in fact, justified—please don't deny it! Just tell me (and all the other "Special Subscribers") exactly what is wrong with these Test CDs—what was "corrected," in other words. If, on the other hand, the "Special Subscriber Edition" is from the new run of Test CDs, just say so.

As long as it's true!  

Glenn Gaudis  
Chicago, IL

Mr. Gaudis's paranoia seems to me symptomatic of late-20th-century America: "You're offering me a gift—where's the catch?" There is no catch, Mr. Gaudis; the CD we sent you should sound exactly as we intended. To check, note whether it was pressed by JVC; if it was, then you should live long and prosper.

The story behind the Test CD is thus: Despite our best efforts, the first and second pressings, made by Distronics, had a number of flaws, mostly due to the fact that every track that had been recorded with a 48kHz sampling rate and had therefore to be processed by a sampling-rate converter had been disfigured by a gross treble rolloff. (The pink noise track had more of a deep rosy hue!) The 1kHz tone turned out to actually have a frequency of 920Hz; there was also a spurious interchannel time delay in one of the monophonic JGH microphonic-test recordings. In addition, the second Distronics pressing had had the preemphasis flag left off for Peter Mitchell's and Brad Meyer's organ recording (track 19).

One of the great things about LPs is that you automatically get test pressings to check that the mastering and metalwork has been done correctly. Although we had requested Distronics not to press our entire order until we had checked the "first CDs off the press," the CDs had already been manufactured by the time we discovered the flaws, and had been sent to the fulfillment house who had started mailing them to readers. Our only option, therefore, was to: continue sending out the flawed CDs; send everyone who received the CD a follow-up card informing them that it was faulty and that a replacement would be sent; completely remaster the CD; check the cut by listening to a WORM disc copy made before the presses rolled into action; and send everyone the replacement CD free of charge. Which is what we did. The "Special Subscriber Edition" label is for internal bookkeeping purposes; otherwise, the CDs sent to new subscribers are identical to those we sell for the munificent sum of $8.95 including shipping and handling. Both are manufactured by JVC in Alabama, as is the CD version of Stereophile's Poem LP.

—JA

Why no Klipsch?

Editor:
One question: in 27 years, you've never reviewed a Klipsch speaker. Why not?

Bill E. Barry  
Tampa, FL

Is Gordon Holt fuming?

Editor:
I just received the June issue. . Wow! Paul Klipsch's name was mentioned—favorably—in three separate articles! Boy, Gordon must
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The test of any great product comes with time, with years of use and years of reliably superb performance. When it passes the test, the marque carried by that product comes to signify something very special to thousands of owners, and to thousands more who hope to become owners. The name itself becomes a symbol of pride, of distinction.

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really be fuming.  

A longtime reader  
Warren, MI

I don’t think the venerable JGH fumes over-much. To be honest, I have no idea why Stereophile hasn’t reviewed Klipsch speakers. Perhaps we should.  

—JA

McClinton & Lehnert
Editor:
I thought Richard Lehnert’s lead-in to the review of Delbert McClinton’s new record in June (p.223) was great; it really set the scene. I had never heard of McClinton until this past May when that great raw voice sounded on my car radio. My reaction was Wow! My next was: Who is that? Thankfully the DJ gave his name. He was appearing at a club in New York at the time. Of course I went right out and purchased his latest. But alas, visits to three different shops, and perusal of record catalogs came up blank as to any of the earlier recordings. Then I saw RL’s review. By a wonderful coincidence I received a catalog from Elderly Instruments, with a rave review of his new LP; and listing two more; Honky Tonkin’ and Live From Austin. Needless to say I now possess them both.

I was a bit disappointed by his voice on Honky Tonkin’; it doesn’t have that hoarseness that makes him special. Then, wonder of wonders, I saw him on The Nashville Network; great! For someone whom I had never heard of before, suddenly Delbert was everywhere. Let’s hope I’m With You is a hit and he will record on a regular basis for us Delbert freaks.

RL’s reviews are unique, and I look forward to each one; keep up the good work, and thanks.  

Hank Moski  
Branford, CT

Beethoven & Frank
Editor:
Thank you for [Mortimer H. Frank’s] splendid article entitled “Beethoven’s Ninth Symphony” (Vol.13 No.6). This piece of music is one of my favorites. I have four of the [performances] he mentioned in his article.

I believe he may have missed one version of the Ninth, namely Fritz Reiner’s version on RCA’s CD 6532-2. It has been reissued on Telarc’s CD 7 63371 2. And yes, he can still get a bargain with the Angel cutout at Tower Records.

—Jeffries

Oops
Editor:
Contrary to the information provided in the footnote on p.148 of the June issue, Thomas Riley [of “What this country needs is a good five-cent cigar” fame] was Vice-President in the Wilson administration, from 1913 to 1921.

—Haddox

Bargain Beecham
Editor:
In the June 1990 “Letters,” Steven Paradis of New York, NY comments on Sir Thomas Beecham. Steven will be happy to know that the Liszt Faust Symphony has been reissued on Angel Studio Series CDM 7 63371 2. And yes, he can still get a bargain with the Angel cutout at Tower Records.

—Jeffries

B. Haddox  
Newburgh, IN
“For once, an add-on subwoofer actually delivers true subwoofer bass with high quality and high quantity at the same time.”

Larry Greenhill

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Larry Greenhill
Stereophile, Vol. 12. No. 10

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Larry Greenhill
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Mahler & the mandolin

Editor:

At the risk of seeming a curmudgeon, I feel compelled to take issue, for the second time in two months, with a Stereophile piece on Mahler (I had previously questioned, in the April 1990 issue, what seems to be a serious mistake in Denis Stevens’s letter regarding the date of Mahler’s conversion to Catholicism).

In Kevin Conklin’s review of three Mahler 5 releases (June 1990), he has an error that could have been avoided easily. He makes much of the mandolin sound in the three recordings in three different portions of the review. In one recording he complains that it can scarcely be heard. In another, he admires it, and in yet another, he grumbles that it is too loud. These types of remarks might be appropriate for reviews of Mahler’s 7 and 8, and *Das Lied von der Erde*, all of which are scored for mandolin. The problem in Conklin’s review is that Mahler’s Fifth is not! A perusal of the score, of course, would have made that clear.

If there is an interesting story as to why Mr. Conklin is so obsessed with this Mahler 5 instrument which never was, I would like to know it. (Does Conklin know something I do not, and if so, would he kindly share it with me? —Gerald S. Fox

President, The New York Mahlerites New York, NY

*I did listen with score in hand. The problem was with my notes, which got mucked up between listening and the writing of the review. So it seems that Eddie van Halen did not show up for the concert that day; probably it was Jean-Luc Ponty.*

——KC

Monster Movies #1

Editor:

This is in response to the interview John Atkinson did with Noel Lee of Monster Cable in December 1989 (Vol.12 No.12).

Mr. Lee referred to Monster Cable’s participation in the “stunning” results achieved on the soundtrack of *Star Trek IV*. He went on to say that *Star Trek V* was completely wired with Monster—dialog, sound effects, and music.

Nothing could be further from the truth.

I was hired by *Star Trek* executive producer Ralph Winter to be the supervising sound effects editor on both films, and can state unequivocally that Monster Cable had very, very little (I’ll explain in a second) involvement with *Star Trek IV* and only a little more on *Trek V*.

The only material recorded with Monster Cable for *Trek IV* and *Trek V* was the Foley—the sound effects such as footsteps performed in sync to the picture. However, all production dialog, music, and all the major sound effects—spaceship sounds, explosions, the “probe” in *Trek IV*, etc.—were recorded with standard-issue paired audio cabling. Furthermore, the rerecording stage for both films, Stage One at Todd-AO/Glen Glenn, is also totally wired with standard cables.

The only difference between *Trek IV* and *Trek V* was that *Trek V*’s dialog transfers were made through Monster Cable—and I surely couldn’t hear any difference.

Again, the music and primary sound effects on both films were recorded and mixed entirely without Monster Cable; the Foley later went through standard cable on its way to 35mm magnetic film generations.

A stereo motion-picture soundtrack goes through a staggering amount of cable after the mike preamp—through patch bays, patch cords, to and from Dolby noise-reduction units. Add to this the minimum of five generations the sound will have traveled before it gets to the two- or six-track print master, and, well, I hope you can understand my not buying Mr. Lee’s claims that using Monster Cable at Foley recording makes a difference.

I have another bone to pick with Mr. Lee: In November 1986, I spent a few hours with the guys from Dolby Laboratories aligning the Village Theater in Westwood, CA, the night before the opening of *Star Trek IV*. Four months later, on April 4, 1987, I attended a special screening of *Trek IV* at the Village, which had just been totally rewired for Monster Cable.

I was shocked to hear so much talk that morning about how much better the theater—and the film—sounded because of Monster Cable. Well, after having heard the film for a few months at Glen Glenn Stage One during the mix and at that same theater, pre-Monster Cable, I can state for the record that I (and the rerecording crew, who were also present at the special screening) could hear absolutely no difference.

—Mark Mangini
Studio City, CA

Monster Movies #2

Editor:

There are so many inaccuracies in JA’s interview
ENERGY loudspeakers have become the personal favorites of discriminating audiophiles the world over. Our Dual Hyperdome tweeter is the key reason why ENERGY recreates the original performance with uncompromised accuracy. With more than $1 million in development, it exhibits better dispersion than any other tweeter on the market today. That's also why our new ENERGY 22-Series incorporates the revolutionary SPHEREX baffle.

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with Noel Lee in last December's issue that I don't know where to begin.

First, let's start with his introduction of Mr. Lee, in which he states that "130 feature films have had their sound recorded" with Monster Cable. Whoa, fella! That sounds pretty darn impressive until you look at what it really means: 130 films have had their Foley—and most of them absolutely nothing else—recorded with Monster Cable. Foley, for those of you who don't know, is the synchronous sound effects recorded in a studio during post-production. And, indeed, the Los Angeles facility that has recorded the Foley for these 130 films is one of the best in the world—primarily because their recording engineers and Foley artists are skilled, creative people.

Foley has become more extensive and elaborate in the past few years, with some 10-minute reels containing over 20 tracks. However, by any yardstick Foley is dead last in terms of its overall contribution to your average stunning soundtrack.

In other words, when you walk out of a theater (or up to your LaserDisc player to change the disc) saying, "Boy, did that film sound great," the chances are excellent that you are not talking about the Foley! You're probably talking about the music or the sound effects—either hard-sync (like powerful gunshots or explosions) or taste stereo background ambiance. Or, if you're really into it, you might be talking about the sonorous, clear production dialog track in which you can hear every word. But... Foley? Footsteps, hand props, cloth movement? Give me a break!

While Foley is (are?) sound effects, they are a small percentage of the effects heard prominently in a final mix. To say that the use of Monster Cable during Foley recording and only Foley recording makes an audible difference is simply ludicrous.

Now, on to some of Mr. Lee's statements in the interview proper. First, he says that Indiana Jones and the Last Crusade and Ghostbusters II were both "done completely with Monster Cable." I beg his pardon? Post-production for the last Indy Jones film was done entirely at the new Lucasfilm Skywalker Ranch facility. As noted in an article that yours truly wrote in the August 1988 issue of Recording Engineer/Producer, that facility is almost totally wired with custom-made cable from another manufacturer! And Ghostbusters II was mixed at Stage S at Todd-AO/Glen Glenn—which is wired, like almost every other dubbing stage in Los Angeles, with a cable whose last two digits are 51.

Mr. Lee's statements are nothing new for Monster Cable. You see, a Monster Cable press release dated April 13, 1987, claimed that Star Trek IV was the first film "ever to be recorded...entirely with Monster Cable!"

Eight months later, another Monster Cable press release stated that Empire of the Sun was the "first motion picture soundtrack in which all the music and sound effects were recorded with Monster Cable" (italics theirs). Sound familiar? It's one thing to believe your own press releases; it's quite another thing to forget them.

Regarding Star Trek IV, I am not aware of the use of Monster Cable at any stage during its post-production besides Foley recording. At least the press release for Empire was honest enough to imply that only the Foley and music recording utilized Monster Cable; nevertheless, that didn't stop them from using such phrases as "an incredible feeling of being there," "significant event."

You know, my refuting Mr. Lee's claims is really beside the point. Even if these films had indeed been "recorded entirely with Monster" cable, so what? Microphone placement during production and music recording, selection and editing of sound effects, the skill of rerecording mixers during the final dub...all this and more is what really makes a sound job great.

The collective efforts of the sound team make the cable—Mr. Lee's or anyone else's—sound good, not the other way around. It is an insult to talented film-sound people to see this company shamelessly grabbing credit for their stupid cable. All the cable in the world doesn't amount to a hill of beans without skill behind it...but you know all of this, Mr. Atkinson.

But since Monster Cable was not used extensively on the soundtracks of Trek IV, Trek V, Indiana Jones and the Last Crusade, and Ghostbusters II, it is clear, going by the praises for these films in Monster Cable press releases, that boutique cable is not necessary to create superb film soundtracks.

Most of what I read about in your magazine is outside of my direct experience—I've never done any A/B tube/solid-state comparisons, etc. And indeed, that's why I read your magazine—to learn.
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But I do know film sound, and now know that Stereophile makes little effort to find out if its advertisers' claims (in interviews and press releases, that is) can be trusted. So, don't you think it gives me pause when I read authoritative-sounding opinions and statements in areas outside my ken? Larry Blake
Sound editor/rerecording mixer
Hollywood, CA

Head Monster Noel Lee responds to Mr. Mangini's and Mr. Blake's letters in this month's "Manufacturer's Comments" section. Regarding Mr. Blake's comment that "Stereophile makes little effort to find out if its advertisers' claims... can be trusted," it is unfortunately impossible for any magazine of our financial size to follow the paradigm set by The New Yorker, which I believe employs a full-time staff to rigorously check every fact stated in every article. Nevertheless, we do try hard to ensure that published articles are factually correct and that quotations from other publications are both correctly worded and correctly attributed, both in articles and in advertisements. And manufacturers' advertising claims obviously come under scrutiny in our reviews of their products. When it comes to published interviews, however, we rely on the interviewee to remember both that he or she is speaking on the record and to be accurate, particularly when it comes to subjects outside the interviewer's area of expertise. If something that has been reported in good faith turns out not to be totally correct, then we welcome readers' letters such as these putting the record straight.

—JA

Recommended Radio Shack
Editor:
I cannot express how happy and amused I am to find Radio Shack's 18 ga. wire listed as a "Recommended Component." As a Radio Shack employee, I am quite familiar with our products and find many of them quite satisfactory. Granted, while nothing that we sell is in the class of the Betas or ML No.20.5s (but then, what is?), I challenge readers to compare our products to the more popular "name brand" components.

But enough of my sales pitch and on with the main point of my letter, which is cable and interconnects. As you have already mentioned, 18 ga. wire is sonically okay, and ridiculously cheap. But did you know about Radio Shack's 16 ga. wire? I've found that for runs of 10' or less, our 16 ga. wire, at a mere 16¢/foot, provides an excellent tonal balance, especially when used with our user-friendly, solderless banana plugs. For longer runs or for use with systems where impedance is critical, twisting the stripped ends together for double runs yields results which, at 32¢/foot, will outperform many cables in the $5-10/foot category. Although our banana plugs will not accommodate a doubling of wire, we do offer gold spade lugs which work very well indeed with many less expensive (and some more expensive!) plug sets. And for interconnects, I heartily recommend the auditioning of our gold audio/video dubbing cable, which, at $9.50 for a 1m pair, boasts lower capacitance, inductance, and overall resistance than many popular interconnects costing four times as much.

I've built up quite an impressive stereo over the years, with components from Rotel, Infinity, Denon, and Sony. Before I started work at the Shack, I used only the trendy cable of the week (as I suspect many unfortunate readers do, too!). But after the results I've obtained with these wonderful, affordable products, I've tossed those costly old cables away! Quality cables need not cost as much as the components they connect! David Gulliver
(A Radio Shack employee and proud of it!)
Glenview, IL

Something amiss in High-End Land?
Editor:
There is "Something Amiss in... High-End Land," too. Taking advantage of today being Father's Day, I was sitting in the backyard lazily thumbing through the pages of your June issue when the letters from Messrs. Seigel and Hamilton (p.13) somehow hit a nerve.

I can't say that I am a "high-end" audio enthusiast yet, and if I judge by my initial experience I'm not sure I'd ever want to be one. But let's go back in time. 1988: I discovered your magazine in a Kansas City bookstore and thought I'd discovered religion. All those strange names like Threshold, Hafler, Well-Tempered, etc. actually had products attached to them. And Stereophile even wrote very interesting, informative, and often amusing narratives about them. I then promised myself that there was life after my dowdy B&W DM2s,
Introducing a unique sonic signature from Acoustat: the new Spectra 11's. Remarkable sound but then so is the price. For under $1100, the critics are calling them “...a sonic and musical bargain.”

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Yamaha C-2 and M-4s. With your magazine's help I thought I could become a high-ender. Wrong.

I took advantage of your six-month trial subscription offer last November. And when I received each issue I frankly read each and every page religiously. I thought I was prepared to venture out to dealer land and get some hands-on expert advice before letting go of my $20k.

So last May my friend and I responded to a dealer ad that appeared in the LA Times advertising: "meet the experts and learn all you want to know about high-end audio." We negotiated the hazards of the LA freeways for 1½ hours and went to the store. What we discovered was: nobody really cares about us, the customers. (Dealers) don't listen. They like to listen to themselves, though. They laughed at us. It was a farce. (They even sell Stereophile!) I asked about tubes and their differences. They dismissed [the subject] (they sold only solid-state). I asked about auditioning some speakers (the dealer sat down and proceeded to explain to us the technologies and benefits of forward- and back-firing speakers). We never did listen to the speakers. I did, however, give him my business card, which, when he noticed my position, prompted him to insert my name into his $$$ tickler file. As he promised, I did get a call from him—and I promptly thanked him for his time.

The point of this letter is, if you, the high-end audio dealer, want my $20k, then, as John Houseman used to say, "You're going to have to earn it."

In another part of the June issue, David Wilson talked about 100,000 audiophiles out there. I truly want to be part of that number. I truly want to learn as much as I can about quality audio. But I'm no fool. I'd be just as happy talking to the local salesperson at RogerSound Lab who spent more time with me than Mr. High-Ender. And I learned more from that experience. Thanks, but no thanks. Frank Lee
Laguna Hills, CA

Listen before you buy!
Editor:
Just a note to make a point—"Recommended Components" are not necessarily a safe purchase. As you folks often point out, please listen before you buy, preferably at home.
I owned a little NAD 2150 (50Wpc) amp, an Apt Holman preamp, and Vandersteen 2C speakers. Interconnects were regular patch cord. Speaker cable was the original Monster Cable. The 2Cs were bi-wired with 10' pairs. Phono is a Dual CS5000 with Shure V15 V-MR. All in all, the system produced a very musical sound, albeit a bit lacking in detail.

I wanted to get a better amp and was saving for a moderately priced tube amp, possibly Counterpoint or VTL. Then a friend of mine decided to sell a brand-new system which recently had been in storage. I bought the preamp and amp without an audition, as they were boxed and in a storage bin. These were two Class C components, the PS Audio 4.6 with 250VA supply and the latest Hafler XLS-280 at 145Wpc. I really expected an improvement, and the price was ridiculously right, so even though I wouldn't have purchased these as a first choice, I went for it. He even threw in new Monster Cable speaker wire and two pairs of Monster interconnects, M-400 and M-500.

I think the new system sounds horrid! I spent the last three weeks letting everything "burn in" and switching things in/out, using Straight-wire rs gain stage. You name it, I tried it. Overall, the sound is bright, dry, two-dimensional, and thin-sounding. Everything sounds a half octave tilted up in treble energy. There is no bloom, no midrange fullness, and the bass is weak!!

I suspected the problems to be anything but the amp. The PS 4.6 rs the Apt was interesting. The PS Audio definitely added to the brightness and was definitely not as dynamic in Straight-wire mode, especially in phono. The PS was more detailed and a little tighter at the bottom. But the difference was minor considering the versatility and switching functions of the Apt. Also, the Apt is less susceptible to hum, the tape outputs are buffered, and it has an infrasonic filter which doesn't affect the sound (to my ears), and definitely affords better wooter control in my listening room. Apparently my turntable isn't well isolated. With the PS, my speakers go crazy.

I really wish someone had mentioned that unbuffered tape outputs were part of the PS package. I've seen literature by VTL, Adcom, and even a cheapo NAD integrated stresses putting the tape feed switch to "off" so as not to affect the sound. The VTL and Adcom stress the importance of buffered outputs. The PS doesn't even have an off position, never mind
AKG has designed new reference headphones: the K 1000. It was clear from the start that natural spatial reproduction is only possible without any ear cushions that would change the sound. This was the idea.

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

The way in which state-of-the-art audio technology has been put to work in carrying out a revolutionary idea placed the K 1000 in the “Reference” class in all reviews that appeared to date. Listen to Reference at the selected K 1000 dealer nearest you.
the lack of buffered tape outputs!! This should have been discussed.

Anyway, I switched out cables, tried biamping, everything. Finally I just substituted the NAD 2150 for the Hafler. Really, no contest. The NAD blows the Hafler away: the overall timbre is more natural, vocals, acoustic instruments are richer and fuller, the soundstage is wider, the sound is not bright, and there is a lot more bass. It was this lack of bass and lower-midrange fullness that make the Hafler sound so thin and lousy. The Hafler has more detail and is a bit faster with transients, but borders on being zingy.

How can an 8-year-old solid-state $250 amp with a little power supply blow away a much beefier $700, allegedly Class A amp?! I’ve done a lot of listening and I appreciate the subjectiveness of this “hobby,” and I tell you the NAD is musical, the Hafler is not.

*Stereophile* constantly mentions the rapid changes in solid-state technology in the past several years, thus making older designs obsolete and no longer competitive. Either this little NAD is excellent or the Hafler is defective or just plain terrible. Now I am skeptical. What do I have to do to get a musical improvement in a power amp? I can’t afford 2000 bucks. I should be able to upgrade with a number of moderately priced amps. I thought the Hafler would be one of them. The PS Audio doesn’t exactly blow away the 11-year-old Apt either. In many ways the Apt is better. Everyone talks about how rapidly the state of the audio art has advanced—well, I’m not impressed yet! Now I have to unload this new Class C stuff. Anyone interested?

Robert Prapatnick
Whittier, CA

**Class C for Adcom?!**

Editor:
Class C for the Adcom GFP-565 preamplifier? I suppose that next you’ll be saying that the ML No.23 has been bumped down to a “B”! The Adcom unit is without a doubt one of the finest units I’ve seen, easily deserving a rating of B as a preamp, and perhaps it should also be included in the phono-preamp section under Class A! And while we’re on the subject of Adcom, what about their GFA-565 monos? I’ve yet to see anything substantial about them in any of the major mags.

Matt Nourse
St. Louis, MO

**Borderline?**

Editor:
I would like to call your attention to the confusing use of the word “borderline,” as used in the “Recommended Components” feature.

By calling a component “borderline”—ie, “borderline Class B”—one is left to wonder just which border is involved. Is it very nearly Class A, or did it barely make it over the border from Class C?

Cameron J. Wiley
Salem, OR

A good point, Mr. Wiley. This issue’s “Recommended Components” has such ambiguities clarified. Mr. Nourse, see this month’s “Follow-Up” section for further thoughts on the Adcom GFP-565; a review of the Adcom monoblocks is planned. Regarding Mr. Prapatnick’s disappointment with his Hafler and PS Audio components, it is difficult to apportion blame for the poor sound be experienced. It is certainly possible that the better electronics will more faithfully pass the signal from what I feel to be a relatively poor-performing LP player.

On the other hand, our reviews did note that both the PS preamp and the Hafler XL-280 have a rather dry, bright presentation overall; my experience has been that they will not work well together because of this. Putting together a musical system unfortunately involves rather more than selecting Stereo-philie’s “recommended” components at random—which is why we encourage visiting a reputable dealer when buying new.

—JA

**Ken the elder responds**

Editor:
Well, perhaps I did feel my years when Clark Johnsen referred to me as “elders” in his otherwise splendid story on the New York High End Hi-Fi show (August, p.89). But what the hell, I’m still younger than Paul Newman.

While on the subject of age, let me tell you about Ms. Marion Rice Hart. She died in August at 98 years of age. She was 54 when she got her pilot’s license. At the age of 70 she flew solo across the Atlantic (Newfoundland to Ireland). Landing fatigued after 2500 miles in her single-engine Beechcraft, she made her way through the crowd to the lounge, downed a rather large glass of whiskey, turned to the assembled reporters and said, “Now I feel better!”

Ken Nelson
Nelson and Associates, Yonkers, NY

*Stereophile*, October 1990
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Marginality safe?
Editor:
I found Mr. David Manley’s reply in May’s “Manufacturer’s Comments” concerning Tom Norton’s review of the VTL 90/90 interesting, not for what he said, but for what was not said.
Specifically, Mr. Manley’s concern for the possibility of an electrical shock. I find it inexcusable for a manufacturer to knowingly design and build goods that appear to be marginally safe for consumer use.
It is always good to know that there are people like yourselves who examine the whole and are unafraid to report their feelings.

Wilbur A. Smith
Washington, DC

Whither 78?
Editor:
I have a very extensive 78rpm record collection that dates back to before WWI that I have enjoyed listening to on turntables built in the 1950s. Unfortunately, each of these record players and turntables has recently gone into cardiac arrest and no repair shop will even consider any resuscitative effort. I recognize that restoration and antiques are not usually featured in your magazine, but, looking at the local magazine racks, if not you, who?
I feel I am not alone in this dilemma, and would ask you to consider an article on both the protection and care of these 78rpm treasures and where, if anywhere, turntables are still being manufactured to play such records?

William H. Duncan
Wilmington, DE

I know that Rega (distributed by Music for Others, St. Louis, MO, (314) 963-0771) makes a dedicated turntable with a 78rpm speed. Does anyone out there know of another high-quality turntable for 78 replay, particularly one fitted with an adjustable speed option?

—JA

Video concerns
Editor:
I didn’t find that you wasted 6% of the May 1990 issue, but I do wish you would proofread your reviews. Mr. Holt quotes specifications, in the beginning of his review on the Proton VT-331, that don’t agree with the text of his review. He claims that Proton “claims a video bandwidth of 5.2MHz and 600 lines horizontal resolution. The specification shows “Band-

width/resolution: 7MHz/560 lines.” Having worked in broadcasting for years, I know that setting any two studio monitors to any color temperature and correct colors can not be done by eye. It takes a specific piece of test equipment to set and measure a monitor. How does Mr. Holt know what is close to 6500° F? (Only in Mr. Holt’s review of the NAD MR-13A does he talk about using a comparator.) Mr. Holt notes that using “A Video Standard laserdisc showed about 350 lines, which is as good as I’ve gotten from any other monitor to date, and as close to the theoretical capability of NTSC as delivered by any existing media.” First, if Mr. Holt used the RF input, the limit of line resolution is 320 lines maximum by the way US TV functions. Second, if Mr. Holt used the composite video input, the NTSC limit is not 350 lines. I’ve used projection TVs that used the composite input with over 1000-line resolution. In Mr. Holt’s review of the NAD MR-13A, he states that there are “470 staggered columns from one side of the screen to the other. Since resolution of detail requires that alternate dot groups show different intensities, it might appear that 470 groups could only yield 235 lines of resolution, and that would indeed be the case if all three parts of each color triad varied in unison. But as long as the scanning beam is no larger than a single phosphor dot...in one triad...,” yet the picture tube used by NAD is in fact a slot-mask black matrix with a 0.6mm pitch, which actually makes a line.
In regard to Mr. Holt’s “Black Level, White Level, and Restoration,” he did not correctly show or identify where on the stairstep waveform is the black level. Mr. Holt forgot to show on any of the four figures a correct video waveform. The NTSC waveform for black level is between the reference line and 10% above that reference.

Sherman Watstein
Winnetka, CA

The literature supplied by Proton with their review sample 331 cited one pair of bandwidth/resolution specs in the instruction manual and another, different, pair on a separate promotional blurb sheet. Neither agreed with the usually accepted rule of thumb that every MHz of bandwidth yields about 80 additional horizontal lines of resolution. I was told over the phone that the video bandwidth of the 331 was 7MHz, so I multiplied that by 80 to get the 560-line figure that I listed in the specs.

For resolution tests, I used both the RF and
“...an extraordinary achievement in speaker-making.”

—Larry Archibald, Stereophile June 1990 Vol. 13 No. 6

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composite inputs; the results were surprisingly similar, as judged by the SMPTE resolution wedge chart on A Video Standard. I don't know how monitor manufacturers define visual resolution, but my stand as of the time I wrote this review was that I would believe NTSC home-delivery sources to be capable of better than 350 lines on-screen rez when I saw something better on-screen. Since then, I have seen 400 lines from that test disc—on a $20,000 professional monitor.

A color comparator really is a necessity for proper B&W screen setup, because color monitors often do not use the exact primary hues adopted by colorimeter manufacturers. For this reason, a perceptive eye (like mine), matching screen color to comparator color, can get higher accuracy than a technician doing the setup by three-color measurement alone. I used a borrowed comparator (they are dreadfully expensive) to check the Proton, and (later) matched the NAD to the Proton by eye. I never did get a match that was close enough to hold up under all ambient-light and screen-brightness conditions, but they were close enough to make it difficult most of the time to tell one's color rendition from the other's.

Color dots vs bars: I apologize for the loose terminology, but it should have been clear from my use of the term 'columns' that the 'dots' were in fact rectangular. These were arranged in groups, with each primary rectangle one third its length below the one to its left. The 'line' they make is a group of colored rectangles side by side and forming a right- and-downward parallelogram.

I thought it was obvious on the brightness/contrast diagrams that black level was the horizontal line below which the diagrams showed solid black. Actual video levels were fudged for simplicity's sake; it would only have confused things to have had to explain that 'black level' is a range of levels rather than a specific signal voltage. Otherwise, the waveforms were a reasonable representation of a real video signal.

—JGH

Stereophile having purchased the JGH-tweaked NAD TV, I can vouch for the fact that it has a truly excellent, neutral color balance—at least to my eyes.

—JA

Coda Technologies introduces the Amplifier System 100, consisting of the Voltage Amplifier 100v and the Current Amplifier 100i. This amplifier embodies many unique concepts whose only purpose is to bring the listener closer to the musical ideal.
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So go ahead, call us radical. Most great ideas are. But call us.

FOR ONCE, GET MORE THAN YOU BARGAINED FOR.

"The VTL 225W monoblocks are easily the most musical and enjoyable amplifiers I have heard. They have an exquisitely liquid and tonally pure presentation that puts the listener closer to the musical experience." — Robert Harley, Stereophile, Vol. 13, No. 1, January 1990.

So often, you pay too much and get too little. Sound familiar? But here's an amp that delivers more than you bargained for: VTL Monoblocks. Reviewers love them so much they keep them. They even pay money for them (unheard of!)

And they rave about them. They say VTL amps sound better than amps costing twice the price. Some even say VTL amps are better than any other amp in the entire world.

Can so many be so wrong? No, they're right! VTL amps sound unbelievably fantastic. And there's a VTL amp to suit any budget and any system; each one is built to last 20 years or more.

Call us today and order yours. We'll inspect them thoroughly before we ship them. We'll pack them with care so they arrive ready to spoil you. And we're so sure you'll agree these amps are more than you bargained for, an unheard of value — that we'll give you your money back if you're not completely satisfied.

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US: Thomas J. Norton

Time Out—Consumer Alert! Back in the May 1990 issue, Sam Tellig told of a little $500 device called the Electreec EP-C from Coherence Industries. The EP-C precisely resembles a Micronta alarm clock available at your corner Radio Shack. Employing this "clock" was claimed—by Coherence—to improve the sound of one's system—although it is only plugged into the wall, not directly connected to the system in any fashion (except by its sharing of the house wiring). Sam did note some improvement, although he was not ready to attribute it directly to this little device.

Another report to me from a different source also indicated a similar result. But that source investigated the matter in greater depth. He had access to both the Coherence Industries device and the visibly identical Micronta alarm clock. He disassembled them both, and was able to find no evidence of any physical or electrical differences between them. Moreover, the sonic change he noted was apparently the same with both devices.

Although I definitely have a problem with this tweak from a technical point of view—it seems totally off the wall—I remain skeptically open-minded; we have bought one of the alarm clocks—the garden variety, not the $500 audiophile special—and plan to investigate. If you decide to try it, we strongly recommend that you start first with the Radio Shack device (it's the Micronta Jumbo LED 12/24 hour alarm, catalog number 63-766). If you hear any difference, but still think that more money will buy you more of the same, don't get the high-ticket job without an ironclad money-back guaran-
"A generation later, transistor designs by such companies as Levinson, Krell, and Threshold have gained my respect as being eminently musical despite their silicon hearts. To this list I can now add Kinergetics Research."
Dick Olsher
Stereophile Vol. 13, No. 1.

"Those audio fanatics who want to be bombarded by jet planes, earthquakes, thunderstorms, and even atomic bombs would probably not like the Kinergetics sound, but if they're searching for music, here is an oasis."
Lewis Lipnick
Stereophile Vol. 10, No. 5.

"...Kinergetics offers its purchaser more than a glimpse of what the best CD sound is all about."
John Atkinson
Stereophile Vol. 13, No. 1.

"...Kinergetics KCD-40 has become an integral part of my playback system. I recommend it very highly, especially to those who have had monumental difficulty coming to any terms with the CD format."
Neil Levenson
Fanfare, Jan-Feb 1990.

"Kinergetic's KCD-20... the first CD player to crack the Class 1 Sound barrier"
Peter Montcriaff
"International Audio Review", Hotline #43-45.

We will continue to create improvements in areas of psychoacoustic that others have yet to discover.
te—and I don’t recommend buying it by mail. Also, be advised that our correspondent reports that two work better than one, so if you should compare the $500 item with the $25 one, don’t plug in the more expensive one with the cheaper one running and assume the further difference you might hear is necessarily due to a superiority in the more expensive unit. Compare them in complete isolation; i.e., unplug the one not in use. Also, although our source strongly believes the difference to be an improvement, use your own judgment in the matter and keep an open mind. Remember, a perceived difference is not always for the better.

This is getting weird, so I’ll say no more until we investigate it ourselves other than that if you follow our precautions and don’t hear a difference, you’ve still got a dandy alarm clock with 2” letters you can read from across the room even without your coke-bottle eyeglasses. Now stop complaining that we never review anything from Radio Shack.

US: Peter W. Mitchell

Audio and video design engineers gather each summer in Chicago for the International Conference on Consumer Electronics (ICCE). The technical papers presented at this meeting often describe new circuits and products that will appear on the market a few months (or a few years) later. For example, this year’s conference included details of JVC’s plan, described here in August, to build S-VHS VCRs containing a DAT-standard digital soundtrack—a plan that holds out the promise of home digital recording at only one-tenth the cost of recording on DAT cassettes.

Another ICCE paper described in detail why local cable-TV systems degrade the sound of both stereo TV and stereo FM broadcasts. Technical standards for cable TV were set long ago in the pre-stereo era, when network TV sound was delivered to local stations via telephone lines. Audio was compromised in cable TV to accommodate the poor adjacent-channel separation of cheap TV sets. If the audio carrier of one TV channel were delivered at full strength, it could produce a shifting pattern of herringbone interference in the picture of the next higher channel.

This is one of the reasons why the FCC never assigns broadcast stations to adjacent channels in a single area. (There is a gap between channels 4 and 5, and a large gap between 6 and 7, so those really aren’t adjacent-channel pairs.) Cable TV systems do deliver signals on adjacent channels, so each channel’s audio carrier is re-modulated in most cable systems to reduce its level by nearly 20dB. This minimizes video interference but makes the audio vulnerable to noise—hiss in mono and a pumping 60Hz hum in MTS stereo. FM signals are remodulated onto cable at a similarly low level, adding obvious noise to wide-range broadcasts.

Most ICCE papers were about advanced TVs, VCRs, and “home bus” systems for multi-room remote control of everything electrical in the house—audio, video, lights, thermostats, coffeemaker, security, etc. In one of the few papers about audio, engineers from Thomson Electronics in Europe described improvements devised for the next generation of magneto-optical disc recorders. MOD recording is one of the technologies proposed for the home-recordable and erasable CD. A MOD machine makes a recording by using the Curie effect: The disc is exposed to a magnetic field while a laser heats a spot nearly to the melting point, and the magnetism is retained in the spot when it cools. During playback the disc is illuminated by a low-power laser, as in a conventional CD player, and the polarization of the light beam is altered when it is reflected from the magnetized spot.

Present-day MOD decks follow the 16-bit CD standard, although MOD discs don’t work in regular CD players. The ICCE paper described modifications of the standard that will enable new MOD machines to provide 20-bit recording and four hours of recording capacity on a standard-size CD. The extension of running time relies on digital data-compression techniques like those devised for digital radio. I’ve heard demonstrations in which a digital bit-stream was compressed by about 4:1 and restored to normal with no audible side-effects.

For 20-bit recording, Thomson uses instantaneous 20-to-16 floating-point digital companding: the audio signal is quantized with 20-bit accuracy, but only 16 bits are recorded on the disc. Whenever the signal is below –24dB, the four most significant bits are zero and can
be discarded without losing any information. When the signal is above -24dB it is simply divided (by sliding the bits to the right in a shift-register); the 16 most significant bits are recorded, and the divisor is recorded separately in the CD's unused subcode space. During playback the divisor is extracted from the subcode and used as a digital multiplier to restore 20-bit signals before decoding. This can be done with no detectable side effects. It's a little like the "high-bit" scheme that Yamaha uses to improve the low-level resolution of its CD players, except that without a stored divisor Yamaha must multiply the signal in the analog domain, a process that is not instantaneous and not always undetectable.

Thomson may soon start marketing its MOD recorders soon to pro-audio users, and the technology may also have applications in video. Whether it will ever appear as a consumer product is uncertain; first there will be an international attempt to select a worldwide standard for the user-recordable CD. There are two families of proposals jockeying for position in this race, with MOD systems on one side and polymer-based systems on the other.

The latter group, exemplified by Tandy's THOR and the Taiyo Yuden START system now being marketed to recording studios, uses a polymer dye that is heated by a laser to form bumps resembling the pits in a regular CD. Such discs are compatible with the existing universe of CD players, a major advantage. But their longevity has been questioned: sustained exposure to sunlight or ultraviolet rays may affect the dye, rendering the disc unplayable. MOD recordings can't be erased accidentally, not even by exposure to a magnetic field (unlike magnetic tapes!). And while MOD discs don't work in existing CD players, future players could be equipped with dual detectors to handle both regular and MOD CDs.

Meanwhile, in Japan, Denon's parent company has produced experimental high-density CDs with a playing time of up to five hours—quadruple the norm. The key to making and playing such discs is a short-wavelength (blue light) laser diode that will be ready for mass-production in a couple of years. This will allow the pits to be smaller and more closely spaced—factors that in today's CDs are limited by the laser's 0.76μm wavelength. Aside from their high-density pit pattern, the new CDs would be substantially the same as regular CDs and would cost about the same to make.

Two obvious questions remain: 1) Would a blue-light player be able to play both standard and high-density CDs, or would it be necessary to build players with two sets of lasers, optics, and detectors? 2) While it obviously would be convenient to have a full-length opera on a single disc (or the complete Ring cycle on four CDs), is there a large enough market for such discs to justify the effort involved? Since manufacturers will have to agree on a new Red Book standard for high-density discs anyway, I don't think a five-hour CD is the best use of this technology. It would be far more sensible to make the discs smaller—for instance, shirt-pocket 3" mini-CDS with 80-minute playing times, or a two-hour movie on a compact 6" laser disc.

Switzerland: Thomas J. Norton

When I remarked in my report last August on Stereophile's New York High End Hi-Fi Show that Goldmund was discontinuing turntable production and redirecting their efforts to CD (Vol.13 No.8, p.64), I was not fully correct. It is true that the days of Goldmund turntables are numbered. But as of this writing the devices are still available, and at least 50 Goldmund Reference turntables are still scheduled to be built before production ceases.

As to the statement on CD, Goldmund informed me recently that, while a CD player will be marketed by Goldmund, it is not a Goldmund in-house product and will bear the logo "Meta Research by Goldmund" (my italics).

Where Goldmund is heavily involved in digital research and development is in the area of recording, specifically DAT. Goldmund remained skeptically open-minded about the digital question in 1983 when Michel Reverchon of Goldmund stated "Those who unconditionally support analog are blind and those who unconditionally support digital are deaf. But digital is the future." From 1985 through 1988, Goldmund was involved heavily in digital research—in digital converters, and transports, and in the limitations of digital. Follow-
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ing the purchase by Goldmund of Stellavox in 1988, development began in earnest on the first Goldmund/Stellavox digital product, the Stelladat professional DAT recorder. The head of the design team for this product was Christoph Heidelberger, designer of the Apogee anti-aliasing filter installed in so many Sony PCM 1630s. Other members of the team were Marcus Erne, former head of Studer’s digital division, and Claude Cellier, for 10 years chief engineer at Nagra, who oversaw digital development at that company.

Goldmund is currently working on the GOLDBUS. The concept behind this is to convert the signal to digital at the microphones (a joint venture is already underway with two major microphone manufacturers) and not reconvert it until it reaches the loudspeakers, where the D/A conversion will take place. This scheme will allow for multiple room systems and, according to Goldmund, provide for full signal integrity.

US: Peter W. Mitchell

Thanks to the two-month delay from when I write something to when the issue arrives in your mailbox and mine, writing for a magazine is like living in a time-warp. During that interval another issue appears which may contain information that alters the perspective of an article already in the pipeline.

Case in point: In the September “Update” (written in early July) I quoted a comparison that Len Feldman has used to illustrate why painting the rim of a CD seems silly. The argument went like this: If a CD were enlarged 1000 to 1, it would fill Yankee Stadium and the pits would be the size of rice grains, illuminated by a bright but narrow \( \frac{\pi}{6} \) "penlight beam. If some scattered light from that beam were to bounce off the distant stadium walls, the returning reflection of that light must be so weak after its 400' round trip that painting the stadium walls black couldn’t make a noticeable difference.

After I sent the column to Santa Fe, I discovered why the stadium analogy is misleading. And when the August issue of this magazine arrived, the “Letters” and “Manufacturer’s Comments” sections contained the same answer. Light reflecting off the walls of a stadium would indeed be weak if it were scattered diffusely. But what if the stadium walls were covered with mirrors? Then any scattered light could be reflected back to the pitcher’s mound at full strength. Indeed, since the walls are curved, they might focus the light and thereby increase its intensity at some locations within the disc. Moreover, since a CD player’s laser beam is monochromatic (one wavelength) and coherent, reflections within the interior of a CD might generate interference patterns like the low-frequency standing waves in a room, with alternating zones of high and low intensity.

Is the rim of a CD a mirror-like surface? This involves two considerations—the smoothness of the edge and whether it is aluminized. The answer depends on where the CD was made. In some CDs the rim is clear and is molded with a smooth, polished surface, producing a weak but specular (focused) internal reflection. In other CDs the rim is clear but has small serratations or irregular mold marks that produce specular reflections in several directions. Many CDs have a finely ground edge that scatters light diffusely. And in about 10% of my CDs (for instance, Chesky discs pressed by Discovery Systems and some DGs pressed in Germany), the rim is aluminized.

If CD sound is affected by stray laser light reflecting back from the edge, the severity of the problem must depend on the reflective character of that edge. If the rim is smooth and clear, most of the light striking the rim will simply pass through; only about 4% bounces back. A fine-ground rim may scatter about 20% of the light back into the disc. At the other extreme, an aluminized rim will reflect about...
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80% of the light back into the disc. So if reflections from the rim affect CD sound, the problem should be 20 times worse in discs with an aluminized rim than in discs with a smooth, transparent rim. Has anyone heard this?

If this is a true picture of the fault that CD Stoplight is supposed to cure, it also is rather ironic, because the problem must be worst in discs with an aluminized rim. These are precisely the discs on which CD Stoplight must produce the least benefit, because the green paint is applied on the outside—over the aluminum. Stray light within the disc will reflect back at full strength from the aluminum and never reach the infrared-absorbing outer coating.

I can’t help thinking that if scattered light within a CD affects its sound, reflections from the thin rim of the disc may be far less important than scattered light that emerges through the large transparent rear surface of the disc, reflects off parts of the mechanism, and reenters the rear surface. Perhaps instead of laboriously painting the edges of hundreds of discs, we ought to paint the entire interior of the player with infrared-absorbing paint.1 Doing anything to the player could void your warranty, of course. Unplug the power cord before removing the cover, and be very careful not to get paint on the lens!

UK: Ken Kessler

Pre-empting the report from the British Hi-Fi Show—only two months away as I write—is not wise usage of resources, nor is it my intention. British hi-fi manufacturers, however, want as much pre-show publicity as possible, so their press releases have already begun to appear. It looks like it’s going to be another show heavy on the loudspeakers. Then again, speakers are a British specialty.

Wharfedale’s press pack is a thick one, suggesting more than the launch of one new model. Wharfedale describes the new Performance Series as the core of its revised lineup. The entry point is a speaker which has its work cut out for it; the Diamond IV is the latest edition of one of the best-selling models this country has ever seen. The Diamond has been, for the last seven years, the entry-level loudspeaker for budget purchasers, and its diminutive size hasn’t hurt it one bit in capturing a chunk of the market for “second” or “remote” speaker systems—it’s as if Wharfedale designed the thing for use with surround-sound systems.

Diamond IV is slightly larger than the exist-

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1 It was reported to me earlier this year that, indeed, Sanyo has been painting the interiors of the disc-playing sections of their domestic-market CD players green since the mid ’80s. Does anyone else have any information about this? —JA
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DIMENSIONAL PURITY
ing Diamond, and sports two new drivers. The midbass frequencies are now handled by a new 120mm unit employing the company's recently developed MFHP2 cone compound, while the tweeter—derived from Wharfedale's current 5 series—is a 19mm metal-dome design. First breakup mode is said to be 38kHz. The dimensions of the '1V' are 273mm H by 184mm W by 185mm D, including the grille; the price will be commensurately low.

The Performance Series not only accommodates the Diamond; it also supplants the Delta models. Two of the four all-new models will be launched prior to the hi-fi show, with the remaining pair to appear at Heathrow. The 410 is a two-way system with a 170mm MFHP2 bass driver and a 25mm metal-dome tweeter in a 355mm H by 226mm W by 225mm D enclosure. Bass extension is accomplished through the use of twin flared ports at the rear of the cabinet.

The 420 uses the same tweeter, but a 200mm woofer in a 495mm H by 252mm W by 280mm D rear-ported enclosure with over twice the internal volume; the bass unit is derived from the technology seen in last year's Coleridge model. All of the Performance Series speakers will be available in walnut or black finishes, the Diamond 4V also being offered in white.

Wharfedale will follow the Diamond IV, 410, and 420 with two larger ported bass-reflex systems, the 430 and the 440, while the popular Delta 30 will appear in revised form as the Delta 30.2. Improvements include a cabinet made of chipboard some 25% thicker than that of the original; this will improve rigidity and reduce colorations. The old spring-type cable clips have been replaced by 4mm binding posts, and the styling has changed. The price increase over the Delta 30 is said to be lower than the increase in inflation.

KEF, whose sister company Meridian launched enough new models at the 1990 Chicago CES to keep four companies busy, is glowing with the success of the latest version of the 105, the 105/3. Word on the street is that the company also has a winner in its budget-priced subwoofer system, about which they've kept inordinately quiet. Whatever, they're launching a new model in the C Series, the floor-standing C85. This system shares dimensions with the existing C95, but employs a reflex-loaded 200mm bass driver in place of the '95's single coupled-cavity internally mounted unit. A three-way system, it features KEF's Uni-Q coincident-source drive-unit and offers the option of bi-wiring or bi-amping.

Though still an American company, Acoustic Research has again chosen a British designer, Dave Berriman, to create the latest offering. As you'd expect, the AR 152 is an acoustic-suspension model—no ports yet for this company—consisting of a 200mm polypropylene-coned woofer and a 25mm cloth-dome tweeter. Tweaks manifest themselves in the form of gold-plated terminals for bi-wiring, van den Hul cable for internal wiring, and high-quality air-cored and metallized polypropylene film capacitors in the crossover. The cabinet is finished in real walnut veneer and is internally strengthened with a figure-eight brace.

Celestion made life tough for themselves by producing a budget speaker that's almost too good. The Celestion 3 is embarrassingly capable for the price (just over £100), so a model coming in above it for 50% more had better be damned good. And on paper, the Celestion 5 sounds exactly like what a bigger '3 should be. The '5 offers higher sensitivity and increased power handling, thus making it suitable for larger rooms and more demanding consumers. The tweeter is the company's own two-piece 25mm titanium-dome design, mounted on a molded polycarbonate fascia. As in the '3, the one-piece molding also forms the basket for the woofer, in this case a 6" driver made with a felted-fiber cone.

This fascia assembly is fixed to a rigid sealed enclosure of 12 liters internal volume, the cabinet made from 12mm high-density particleboard. The actual baffle board is 15mm thick. All cabinet edges are chamfered to reduced diffraction effects, and the molded plastic grille frame is open-edged to avoid further degradation. Completing the contents listing is a simple five-element crossover bonded to their terminal pod, four-way 4mm binding posts, and a choice of finishes including simulated black ash veneer or oak. Like the '3, the '5 can be used on bookshelves but is recommended for use on 23" stands.

As if following the '3 wasn't enough of a project for 1990, Celestion has also inflicted upon itself the development of an upgraded SL700, to be called the SL700 Special Edition. This one, I'm sure, will be as controversial as its predecessor, as every model in the family tree from that first SL6 so long ago has had a gesta-
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**Stereophile, October 1990**
ation period fraught with difficulty. And when the company moved from wooden bodies to Aerolam enclosures, the production difficulties almost killed the projects in their infancy. But the SL600 and SL700 survived, with press and public showing only love/hate responses. If ever a speaker type polarized its audience, the SL (and its derivatives) is it.

Expect the response to the SL700 Special Edition to create as much of a fracas. Too many journalists are too prejudiced, pro or anti, toward the earlier models to approach the latest version with clear heads. Add to this the anti-British backlash in certain US journals, the belief that small British speakers can't yield bass, the thought that no SL-series system has any treble, and you're looking at some potentially engrossing reading.

What Celestion has done to the SL700 is all in the details, the speaker looking just like the "normal" SL700. The voice-coil of the mid/bass driver has been lengthened to increase its throw, and a new suspension compliance has been specified. These should provide greater dynamics, better power handling, and better resolution when the speaker is asked to yield high levels—all addressing valid complaints about the earlier version. The bass frequency has been fine-tuned at around 100Hz to provide greater smoothness² and better bass extension, again addressing the typical complaints. Detail changes have also affected the crossover; the sensitivity is now more constant over the full bandwidth of the system, so the frequency response should prove flatter and with greater extension.

Other virtues touted by Celestion include a more realistic soundstage (I didn't think there was a problem in a correctly installed pair of standard 700s), while the "rebalancing" of the system suggests synergy with a far wider range of amplifiers and room types.

With this speaker due to appear around the time of the UK Hi-Fi Show in September, the various editors will have a hard time deciding which reviewers are capable of handling a pair without resorting to too many walks down Memory Lane. Horror stories about no two samples sounding alike, cabinets which showed evidence of the Aerolam learning curve, etc., are bound to make many reviewers wary. But Celestion has gotten its act together with a vengeance since Gordon Provan took the reins, so I don't think they'd dare release a sample prematurely. Then again, they'll get reams of publicity if they do.

US: Thomas J. Norton

If you've read my ruminations about film sound in my last "Matter of Taste" (Vol.13 No.6), or if you're into film sound at all, you'll realize that the best theater sound to be had up until now has been off of 70mm prints with a six-track, magnetic soundtrack. Unfortunately, such prints are comparatively rare and expensive and are seldom seen outside of major metropolitan areas.³ A recent development, however, will make 70mm prints less expensive and, I hope, extend their availability to at least mid-sized cities. That development is Cinema Digital Sound. The main players in the development of this system have been the Eastman Kodak Company and the Optical Radiation Corporation. Another contributor has been Apogee Electronics Corporation—of digital filter fame. It is expected that the cost of the required digital decoding systems—$15,000—$20,000—will tempt many theater owners to upgrade their sound.

CDS, which is compatible with existing systems, has a 0.1"-wide optical digital soundtrack encoding five full-bandwidth channels and a subwoofer channel. A MIDI control channel is available for other functions, such as opening and closing curtains, raising and lowering the house lights, or controlling theater sound levels.⁴ The bandwidth of the five major channels is 20Hz—20kHz, and distortion and channel separation are comparable to that of CD playback. The 16-bit system also operates at the CD standard of 44.1kHz; a delta-modulation system is used to encode 5.5 million bits per second.

² This was certainly true of a pair that I auditioned earlier this year. —JA

³ One definite negative of my recent move from Los Angeles to Santa Fe is that I now get to see films in the typical multiplex mini-shoebox theater.

⁴ Although the sps are supposed to be standardized in at least one proprietary theater sound system—THX—my recent experiences at theaters in Los Angeles indicates that this standard is being widely ignored (or else film producers are mixing their films to be reproduced at unconscionably high levels). After all, the most obvious attribute of an upgraded sound system to the average, sonically unconscious theater owner and patron is its ability to play louder, not the less easily appreciated "subtleties" of wider frequency response, enhanced spaciousness, and uniform coverage.

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The advantages to this system, as I see it, will be to reduce the costs and increase the number of 70mm prints. Given the limitations of current soundtracks, most of which are heavily overdubbed analog to begin with, it is doubtful if there will be a noticeable “improvement” over 70mm magnetic prints (leaving aside for the sake of argument the entire analog vs digital debate endlessly engaged in by us crazed audiophiles). It will also apparently be adapted at a later date for 35mm prints—and here the prospect for improved film sound in small markets is a real possibility. Even at its best, the current 35mm optical soundtrack has serious technical limitations.

**The Netherlands:**
**Peter van Willenswaard**

At its most recent Europe Technical Seminar, Technics/Panasonic introduced a revolutionary technology to cancel the effects of jitter before D/A conversion. The philosophy is that even the most sophisticated PLL circuitry can never totally suppress jitter in the locally regenerated clock—see my article on jitter and digital signal transfer in next month’s Stereophile. What you need to do it right is a very stable and accurate local quartz clock controlling the timing of the digital filter and the D/A converter, but a quartz clock can not possibly be synchronized to the incoming signal. Leaving things to chance would result in a sync error within seconds. Their solution to this problem is to store the incoming data in a 1.5-Megabit RAM memory chip and read out the stored data at the reliable pace of the local quartz clock, the memory acting as a buffer absorbing the data surplus in case the incoming signal’s clock runs faster than the local quartz clock, and vice versa. This resembles what happens in every CD player right after data readout by the laser, where, due to the finite servo capabilities of the disc-drive mechanism, the data readout is never exactly in pace with the CD player’s clock (but the memory used there is much smaller, since what it has to buffer is only a matter of milliseconds).

Technics/Panasonic calculated that if the sending end (CD transport, DAT recorder, digital radio) clock obeys the ± 50ppm EIAJ frequency accuracy specification, the 1.5Mb buffer memory capacity will be sufficient for 120 minutes of uninterrupted replay. If the program contains 0.4s of digital silence (infinity zero) at some point, the memory is reset to its initial state and a new 2h period starts. In the unlikely event memory overload should occur, the system is automatically switched to a digital PLL, which is not jitter-free but ensures continuity.

This system is included in their new up-market SH-X1000 D/A converter. If it works as promised, it means a radical step toward totally jitter-free D/A conversion. I suspect that reading the data out of the memory might introduce some new (random?) jitter due to variations in access time. Technics/Panasonic’s own specification is a remaining jitter of just under 0.5ns at the D/A converter, which is still more than twice as high as the desired maximum I calculated. (But it is unclear whether this figure concerns RMS or peak-to-peak jitter, which can make a factor 3 difference.) It is, nevertheless, a low figure; they claim total independence from the amount of incoming jitter up to 85ns, and that should do away with all but the grossest interface impedance mismatching and other sources of jitter.
This is the third in an informational series designed to reduce the large degree of confusion that exists today about high end vacuum tube equipment.

Power Supply Regulation

Most audiophiles know that power supply regulation is important. Most amplifiers claim to have it. As with many things, it is a question of degree and semantics. Let's look further.

An unregulated power supply consists of a transformer, rectifier, and filter. The transformer converts the AC line voltage to a higher or lower voltage. The rectifier converts the AC to DC, but a great deal of ripple (fluctuation) is present in its output. The ripple is dealt with by a filter consisting of capacitors along with resistors and/or inductors.

Confusingly, even an unregulated supply possesses a degree of regulation, which refers to how much its output voltage varies as the load on the supply changes. Load changes occur rapidly in a power amplifier as musical signals vary, and is most severe when a tube is driven to cutoff or draws grid current. The regulation of the basic supply is a function of the resistances of its components, the leakage inductance of the transformer, and (for fluctuations of very short duration) the amount of capacitance in the filter.

While less costly to construct, the unregulated supply may be inadequate for two reasons. The first by definition is poor regulation; even with the best precautions the output voltage is far from constant as the load varies. The second is poor voltage stabilization; the DC output voltage varies with changes in the AC line voltage. No amount of capacitance will cure poor voltage stabilization.

Consider an unregulated supply for an output stage delivering 450 volts DC from 120 volts AC. If the AC source varies by ±5% (from 114 volts to 126 volts, which is common), the DC supply will range from 428 volts to 473 volts. To protect the tubes the designer must ensure that the DC voltage is not excessive for the highest AC voltage that might be encountered. As a result, the amplifier will usually be working from a substantially lower DC voltage than it could, resulting in decreased power output and increased distortion.

Of greater concern perhaps is the fixed bias supply of an amplifier. If it has been designed to give −45 volts DC from 120 volts AC, an unregulated supply will vary from −43 volts to −47 volts as the AC varies ±5%. This will change the idle point of the output stage, possibly altering class of operation from A to AB1 or from AB1 to AB2.

To solve these problems one must include active regulation. However, there are many degrees of regulation. Some designs have a simple Zener diode or gas voltage regulator tube (e.g. OA2 or 5651) across the supply. This provides some regulation, but not as much as with series regulation. Better yet is amplified series regulation, with which it is possible to hold a 320 volt DC supply within a range of 3 volts as AC is varied from 110 to 130 volts! Since regulation takes power, highly regulated supplies run quite warm, while cool running supplies usually have little or no regulation.

So, what have we learned? While a surprising number of good sounding tube amps lack regulation, the best and most consistent performance will be achieved with active regulation. Nevertheless, a regulated power supply can not by itself guarantee sonic excellence. Listen, and always let the sound be your guide.

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Although I had said in last month’s “Final Word” column that Sam Tellig would not be writing any more “Audio Anarchist” essays, this final epistle arrived after the September issue had gone to bed. As it contains germane opinion on the last product he had listened to, I am running it as a postscript. —JA

After several more weeks—almost a month—it now appears I have underestimated the Meridian 203 processor. It’s even better than I thought. You should buy one.

Like other processors, the 203 takes a while to burn in and sound its best. In the past few weeks, the sound has improved considerably—most notably in smoothness and the retrieval of detail, including low-level ambient information.

I helped things along with a few tweaks. First, I substituted a better-quality optical cable (from Onkyo) for the very thin optical cable supplied with my Philips CD60. The thin optical cable was strangling the sound! I also substituted a Music & Sound power cord for the one which came standard with the unit—a further improvement. And I changed my interconnects from Cardas Quadlink to Purist Audio Designs—a very substantial improvement, particularly in detail and overall resolution.

As a result of these tweaks, and the further passage of time, I now believe that the Meridian 203 can hold its own with any processor I’ve heard. Some processors may surpass the 203 in apparent detail, but not by much. But I have not heard any processor which surpasses the 203 in terms of musicality. I hasten to add that I haven’t heard all available processors, including the Wadia models and the new processor from Stax.

There is a fundamental rightness to the 203, and perhaps to the whole Blitstream approach. To put it another way, the last thing the 203 sounds like is a processor. The musical presentation is natural, free of strain, free of any sense of specious spaciousness or hyperdetail—or too much processing going on.

Look, you can argue whether or not this is the best processor going. The point is, it’s musical and at $990 it’s a steal.

Like all outstanding pieces of audio equipment, the Meridian 203 requires some tender love and care. Don’t judge it cold. Don’t even judge it after the first two or three weeks. Leave it on all the time. Use the best-quality optical or coax connecting cable you can find, and the best interconnects, too. Experiment with several power cords, if you can. Use a good transport—I’m particularly keen on the moderately priced machines from Philips, like the CD60.

I realize now one of the reasons I wanted so badly to put a hold on my audio reviewing. There is too much hype in high-end audio. Products like the Meridian 203, the B&K M200 balanced monoblocks (which I’m sorry I won’t get the chance to review), the new Coda 01 preamplifier, the Krell KSP-7B preamp, the Krell KSA-150 amp, the Spendor $100 speakers, the SME 309 tonearm, and, of course, my beloved AR ES I turntable—all these products prove that you don’t have to spend an outlandish amount of money to get great sound. Then you can forget about the sound and concentrate on the music. Maybe I should have remained the Cheapskate after all.

Goodbye, comrades. Come to Russia with me next spring if you can. Watch for my tour ads!

Stereophile, October 1990
"In its price category, the Adcom GFA-535 is not only an excellent choice; it's the only choice."

The complete report:
Sometimes products are too cheap for their own good, and people don't take them seriously: the Superphon Revelation Basic Dual Mono preamp, Rega RB300 arm, AR ES-1 turntable, Shure V15-V MR cartridge, and the B&K ST-140 power amp. They can't be any good because they cost so little, right?

Wrong, of course.
Adcom appears to be having the same problem with their $299.95 GFA-535 amp. Credibility.

Now if this amplifier were imported from England and sold for $599.95, then maybe it would be taken seriously. And highly praised, no doubt.

For the baby Adcom is one of the finest solid-state amps I have heard. No, not the best; I'm not sure what is the best. But it's an amplifier that is so good for so little money as to be practically a gift.

Actually, when Rob Ain from Adcom called, I was about as enthusiastic about the GFA-535 as you were before you finish reading this piece. But Rob insisted, "You've gotta hear this amp."

He brought it over the next day, along with the GFP-555 preamp ($499.95), and we put both pieces into the rest of the system: a Shure Ultra 500 in a Rega RB300 arm on an AR ES-1 table, with Quad ESL-63 speakers on Arcici stands. Then we chatted for a half hour or so while the electronics warmed up.

And then, simultaneously, the two of us decided to shut up and listen.

"I've never heard the Quad ESL-63 sound better," Rob said. Of course, he was hardly an impartial observer, but the sound was extraordinarily clean, detailed, and musical. If it wasn't the best sound I have ever heard from Quads, it was pretty close.

This humble $300 amplifier was driving a pair of very revealing $3000 speakers and giving a very good account of itself. (We listened first to some Goran Sollscher classical guitar.)

"So how come this product isn't flying off the dealers' shelves?" I asked Rob.

"I don't know. Everyone wants the GFA-555 with 200 watts per channel. Including people who don't need it."

"Does the GFA-555 sound any better?" I asked.

"It's our aim to have all our amps sound pretty much the same. You pay more money, you get more power."

Rob pointed out that while the GFA-535 is rated at 60Wpc, it puts out more like 80. And while I did not do any measurements, my experience with other amps tells me Rob's right. I suppose Adcom doesn't want to steal sales from its GFA-545, rated at 100Wpc and selling for $200 more.

After a couple of hours, Rob left, grinning from ear to ear, and I later sat down to listen alone. True, when I tried certain Telarc's and pushed hard I could get the amplifier to clip—two LEDs quickly light up (very useful). But the Quads were running out of the ability to use the power anyway. My first impressions
were confirmed: the GFA-535 is one of the best amplifiers around for driving Quads. Spendor SP-1s, too.

Suddenly, it hit me what this meant. Conventional wisdom had been dealt a severe blow. You know, the old saw that you should never power a good pair of speakers with a

*The GFA-535 reminds me of...amplifiers that sell...for about three and five times the price.*

cheap amplifier. Here was a cheap amp—one of the cheapest on the market—that sounded good with Quads, Spendors, later Vandersteens. Probably Thiels, too—at least the CS1. What it means is you can stretch your speaker budget a bit and get the speakers you really want, then economize by buying an Adcom GFA-535 for $299.95. True, you may be a little power shy, but probably not much. And to say the least, the GFA-535 would make a decent interim amp.

What does the GFA-535 sound like? (You thought I’d forget that part, right?) Well, this is one of the most neutral amps I’ve heard.

*...the baby Adcom is one of the finest solid-state amps I have heard...so good for so little money as to be practically a gift.*

While it doesn’t sound particularly tubelike, it avoids the typical transistor nasties through the midrange and into the treble. I wouldn’t call it sweet—there’s no euphonic coloring—but it isn’t cold or sterile. What it is, is smooth. And detailed. Far more detailed than I would ever imagine a $300 amplifier could be. The GFA-535 reminds me of the Eagle 2A and PS Audio 200C, amplifiers that sell, respectively, for about three and five times the price. Of course, they have more power. And they are more detailed. The point is, the Adcom comes close. Very close.

The bass, like everything else, is neutral, certainly not fat and overdone. But it’s here where you notice that this amp is not a powerhouse. You just don’t get the solidity and extension you get with a very powerful (and expensive) solid-state amp. Nor do you get the breadth and depth of soundstage that you often find with a very powerful amp. The Adcom GFA-535 sounds a wee bit small, which it is.

My only criticism, and it’s more of a quibble, is that the speaker connectors are non-standard and unique (so far as I know). You insert bared speaker wire into a hole and twist the connector tight a quarter turn. Most speaker cables will fit, but some will not. Certainly MIT won’t. Neither will the best Kimber, the kind with eight clumps of strands. The less costly four-clump Kimber will, and proved an excellent choice. My sample amp was quiet—

*This amplifier is so good and so cheap that I think any CD owner who buys an integrated amp is nuts.*

no hum—and ran cool. There are selectors for two sets of speakers. And the 535 looks nice.

And talk about economy: If you’re not into LPs anymore, you could buy a Mod Squad, dbx, or Old Colony line-level switching box—or possibly a B&K Pro 5 preamp, with its switchable line amp section (only $350), or the Adcom SLC-505 passive preamp ($150)—and run it with a CD player. In fact, if you are into CD only (no tape, no tuner, no phono), you could buy a CD player with a variable volume output and run it directly into the Adcom. This amplifier is so good and so cheap that I think any CD owner who buys an integrated amp is nuts.

In its price category, the Adcom GFA-535 is not only an excellent choice; it’s the only choice. The real question is whether you should buy one even if $299.95 is much less than you planned to spend for an amp—ie, whether you should put the money into a better CD player or pair of speakers instead.
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Mrs. Kevin Conklin, who operates professionally under her own name of Linda Tasker, is obviously not a devotee. In fact, when KC is in a particularly disparaging mood, he has been known to mutter, "What do you expect from her—she listens to Country-Western music!"

When Stereophile confronted her with this information, Mrs. KC confessed, "Yes, that's true, but only in my car—and that is my designated listening room."

As you might gather from her lucid description of the ideal audio house, Linda is a registered architect. She and Kevin are expecting their first child, which should provide new audio experiences for the couple.

If the demand is sufficient, she will consider starting a support group for Relatives and Significant Others of Audioholics.

Part I of this article covers the importance of stuff to an Audiobolic. Part II relates to the space in which to appreciate the stuff, as in "I love you—but I need my space."

**Provide a Designated Listening Room**

Recognize that the audiophile's collection of recordings and components is very important to him/her. More important than the car. More important than any other cherished possessions. Even more important than the Three

---

1 Persons of Opposite/Same Sex Sharing Living Quarters; pronounced "POS-sel-cues."
2 Significant Others
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I invited the neighbors over for cocktail hour knowing that Kevin would not commit mayhem in front of witnesses.

The physical design of the listening room is also important. Remember to consider floor loading; in a custom home, you will want to specify structural reinforcing in the areas where heavy album storage may be anticipated. A concrete floor with plush carpet is ideal; closer joist spacing will reduce vibrations in wood floors.

The contractors may be able to provide wiring troughs in the baseboards, or in the floors, covered by carpet. Plan for additional electrical outlets for future audiophile equipment. Perhaps a supplemental generator.

For sound isolation, consider staggered-stud walls with insulating batts. Insulate adjacent rooms above and below with the same batt blankets. These can definitely be helpful to the longevity of a relationship. They might even add value to a house for resale—to another audiophile.

Space: Dedicated Listening Times

Audioholic requires a music fix on a regular basis to maintain equilibrium. There is no known substitute, although sex is sometimes an acceptable, albeit temporary, diversion of attention.

We have Dedicated Listening Times on Tuesday and Friday nights and Sunday afternoon. Actually, the Listening Times coincide with my moonlighting job; however, I'm not sure which came first. But now I have A Place To Go, and Things To Do when he needs to listen to five hours of Pink Floyd, or 20 different versions of Mahler's Ninth . . . twice.

Not only does this arrangement allow Kevin to plan and look forward to his listening hours, but it preserves my sanity.

Negotiate a schedule that will work for you and any others in the household. This is a good time to go shopping—except that you will have to take along the rug rats. This is a good time

Stooges video. It is debatable where children rank compared to these collections.

Creating a sanctuary for listening provides several benefits. Of utmost importance, the listening room becomes off limits to most other activities. This is important, because the dogs will not knock over the speakers, children will not reorganize the albums. It reduces the probability of dislocating sensitive and tenuous cable connections.

If a dedicated room is not possible, I would suggest using the Living Room, as most are only used infrequently for company. With advance notice, it may even be possible to entertain guests in this room. My experience is that the various collections also make good conversation starters:

“What are those glowing tubes in the metal cages on the floor?”

“You sure have a lot of records. How many are there—about two, three thousand?”

George Carlin is renowned for his stuff. Similarly, the audiophile needs a place to keep his stuff. A secure place, where no interlopers will violate his stuff. An intimate place where he can be alone with his stuff. A private place where he can enjoy a good fix. As the Significant Other of an Audiophile, you must understand, tolerate, and respect these needs.

I learned about designated listening spaces the hard way. When Max, our German Shepherd, knocked over a speaker (which was atop a metal stand and balanced precariously on three tripod-like cones), I spent an hour sitting in the driveway awaiting Kevin’s return in order to prepare him for the apparent ruin; I feared for the dog’s life. That violation resulted in the dogs being banished from the room.

The next serious problem arose about six months later, when I backed into a speaker while vacuuming. The slightest bump sent it gracefully arcing to the floor. In fear of my own life, I invited the neighbors over for cocktail hour, knowing that Kevin would not commit mayhem in front of witnesses. That violation resulted in my banishment from the room; however, it also absolved me from all responsibility to clean the room.

Our listening room is presently conveniently located off the major hallway, so the dogs and I can come and go, and occasionally wave, thereby maintaining a modicum of human contact even during periods of intense concentration.

Stereophile, October 1990
to visit your family—I'm sure the resident Audi-oholic would agree. This is a good time to work in the yard—but do not use power tools. This is a good time to take a class, or dine with friends, or pursue countless other activities. The important concept is to make plans for Listening Time, and to think of it as an opportunity to do something for yourself.

Elective Listening Time is different from Dedicated (core) Listening Time. ELT may occur anytime that there are not other pressing concerns. It is advisable to avoid any trivial interruptions; make notes about things you need to discuss, stories you wish to tell, and cover them after the album is over. (By the way, I am now allowed in the listening room during ELT—and even welcomed, if I provide food-and-beverage service. However, Kevin dusts and vacuums.)

We still disagree over whether it is a hostile act to listen to the radio in another room during Elective Listening Time. Turning on the TV is considered a Declaration of War... except, of course, during Designated Watching Times.

The use of an answering machine is suggested during any Listening Times. Phone calls received during Listening Time are rather like phone calls at 3am: without an answering machine, there is little likelihood that the recipient will remember anything three hours later.

Be aware that your Audioholic is not likely to hear the doorbell, smoke detectors, or other
distress signals in his stupefied state. Above all else, be careful not to lock yourself out! While conducting the New York Philharmonic, your Audioholic isn’t apt to notice your absence, certainly will not hear the doorbell, and won’t answer the phone.

Turning on the TV is considered a Declaration of War...

Mrs. KC is still adjusting to marriage to an Audiobolic. A recent fall—during ELT—left her stunned, slightly injured, and unaided. Although she was less than 20' from KC, she was behind the speakers, and the intensity of his concentration screened out extraneous noises. Must have been (yet) another Mahler symphony.

Named “Most Controversial New Product” WCES, January 1990

"As far as what I think, the CD Stoplight has the greatest effect of any CD tweak I have used yet. This is the missing element that makes digital, in my system, sound better than analog-assuming an excellent recording, of course."

Dr. Michael Gindi - Sounds Like Magazine, Issue Number Eight
"Simply amazing! In fact, the degree of sonic improvement I heard from treating my discs with CD Stoplight is greater than that which I’ve heard from switching from a garden-variety CD player to a ‘you-won’t-believe-the-price’ outboard processor using the latest computer technology available."

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Highlights of the review:

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

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

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

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

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

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

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

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

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

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

B & K has undertaken the ... daunting task of manufacturing and marketing affordable equipment in numbers sufficient to ensure a reasonable return on invest-

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

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THE SOUND THAT
It was hard to believe that the winding, two-lane country road was anywhere near cosmopolitan San Francisco. But it was, only a few miles to the north. The scenery was breathtaking, the weather gorgeous; I had to restrain myself from stopping to take photographs. If I did I'd be late. Still, the entire eight-mile drive from Highway 101 looked like an "ideal country road" movie set. But it was real. The entryway to my destination fit right into the pastoral scene—no splashy signpost or gee-whiz billboard. Just a rustic (though clearly new) numbered gate, which swung open automatically as I approached. I had just passed through the front door of Skywalker Ranch, headquarters for Lucasfilm, Ltd.

It was late March and I was there to interview Tomlinson Holman, Lucasfilm's Corporate Technical Director. Audiophiles whose audio memories go back more than ten years will remember Tom Holman for his work in consumer electronics, first at Advent where he worked under Henry Kloss, and later as a co-founder of Apt Corporation. In 1980 he migrated from Massachusetts to California, and from that time has been heavily involved in the design and continued updating of Lucasfilm's post-production facilities—to the point where they are now, without possible argument, state-of-the-art. His accomplishments have reached beyond in-house production facilities to encompass the development of the THX theater sound system—replicating as closely as possible in public motion-picture theaters the sound quality heard in Lucasfilm's own screening rooms (for which he was also largely responsible). At present, Tom
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spends three days a week in Los Angeles, where he teaches film sound at the School of Cinema-Television at USC. He is also presently involved in plans to bring a form of the THX sound system into the home to enhance the home-theater experience. I was anxiously looking forward to the interview and a visit to the facility that the Star Wars films built.

But first I had to get through the gate. That rustic entryway was somewhat misleading. A hundred yards or so up the road was a guard shack. Security here would do justice to a military base. Or even CIA headquarters. No problem—I was expected. Following a cheery “Welcome to Skywalker Ranch,” I was waved on through. Just past the guard shack was a large guest house and what was apparently a private fire station. Another mile or so up the road I found myself in a small valley dominated by a stunning, white Victorian-style structure—the main building for the complex. My destination was one of the smaller buildings surrounding it.

Tom met me near the parking lot, and we proceeded immediately to tour the facilities. My strongest impression was of a first-class environment for creative work. Nothing about it was ostentatious (it definitely did not look stereotypically “Hollywood”), but it was clear that the bean-counters had not bad the final say. The main building, with its stained-glass-domed library, wood-paneled walls (the paneling recovered from old wine casks), open, cheerful employee cafeteria, elegant main conference room, and plush, executive screening room (THX sound, of course) did not remind me of any work environment I have ever worked in, seen, or read about.

But the main items of interest were located several hundred yards away, in the new technical building. Tom spent three of his ten years at Lucasfilm designing this facility. Inside are complete post-production facilities—with a heavy emphasis on sound. The Scoring Stage has adjustable absorption on the walls and ceilings, the chosen setting depending on the material to be recorded. This stage is large enough to comfortably accommodate a full symphony orchestra—a 110-piece orchestra bad, in fact, recorded there earlier that same week.1 It also has, I understand, the lowest ambient noise level of any (known) facility in the western US. (The air conditioning and heating systems for the entire technical building are underground and away from the building itself). The adjustable acoustical panels in this room, I found out later, allow the reverb time

1 This was the first recording by what is apparently to be known as the Skywalker Symphony directed by John Williams, a new group of first-chair and other top musicians from the Bay area, to be released on Lucasfilm’s own label.
"Moving on to other music, I must start by saying that the Signatures are the most enjoyable speakers I have spent any significant time with. Record after record, CD after CD, they were unfailingly musical. The Signatures do so many things well it is hard to know where to begin. The Signatures revealed musical information I never knew existed in my record collection. It was not difficult to turn what started as a short listen into an all-night marathon. They are addictive.

The Hales System Two Signature loudspeakers are worthy of my highest recommendation."

to be varied from 0.65 to 2.75 seconds. Smaller mixing stages employ consoles manufactured with improvements—which Tom helped design—aimed at improving the actual sound quality. The background noise levels in these stages are also very low, and may be artificially increased to simulate the conditions existing in an actual movie theater. Tom demonstrated one simulation program for me. It sounded exactly like a typical theater air-conditioning system in operation.

All soundtrack recording at Lucasfilm is still analog on film recorders and dubbers (playback-only machines)—not because of any anti-digital bias, but because the special timing and synchronization requirements of film editing can, at present, still be better handled with analog technology. Tom has also been involved in engineering improvements to the analog tape machines, including minimizing phase errors—important when dealing with surround-sound. We also visited the main screening room—much larger than the executive screening room in the main building, but engineered to sound as much like the latter as possible. It can accommodate 300 viewers, the peak staff level at Lucasfilm (staff varies between 200 and 300, depending on production activity). It is a fairly dead environment acoustically—best for film sound, according to Tom. Naturally, both 35mm and 70mm film formats can be shown. I didn’t get to see or hear it in operation, but it appears to be an exceptionally fine environment for film exhibition.

Following the tour, we settled down in a quiet spot on the closed-in porch of the main building. I started the conversation by telling Tom that I understood his interest in film actually predates his involvement in the audio field…

Tomlinson Holman: I was always interested in technology for the arts, making things for artists, and [I’m] still doing that. I did lighting and sound for plays and musicals in high school and then went on into college… I wound up graduating in communications at Illinois [and] worked in film production at the University for some five years after graduating, making documentary films and the like. But I started a small company and I built some products and filled people’s needs, and that’s what attracted Advent to me and me to Advent. I went to Cambridge in 1973 to visit somebody else on a complete lark, and not even knowing [Advent] was looking, I called up a headhunter and said “Here’s a resume.” He called Advent and got me an interview… they didn’t call back for a couple of months, but when they did, they said, “Can you come?”

I started working on a switching-mode power supply, Class-D, for an amplifier/receiver. These things have not yet seen the light of day in practical production, but Henry Kloss’s idea was that it would be very small and compact, and easy to use, yet pack a big wallop [laughs]—really have a lot more power than the package size or weight indicated. So I worked on that power supply for almost six months while the amplifier technology came from a guy outside the company.

It became increasingly clear, however, that the complexity level that you would have to go to to bring this off was so great that the reliability might not be that good. So we abandoned it. The first project I worked on that really got out the door was the Model 400 table radio, which was done much more quickly. The audio parts of it only took weeks to do. I worked really as the project engineer, integrating all the bits and pieces: the industrial design, the circuit design, the circuit board layout, and all the parts.

That’s where I really got training in how the product ought to be perceived and used by the customer. I remember I saved a nickel by using a 6’ line cord instead of a 9’ line cord, which is the limit the UL gives you: it can be between 6’ and 9’. And Henry got all mad at me because I hadn’t put on the extra 3’, because you couldn’t now put the radio right next to you where you could use it. That’s really what I learned from him. I needed to learn about product development. I certainly learned some engineering things, there’s no question about that, but I’d say the main things I learned were more product-oriented: How is a product perceived? What good is it in people’s lives? That sort of thing.

I saved a nickel by using a 6’ line cord instead of a 9’ line cord. Henry Kloss got all mad at me because I hadn’t put on the extra 3’.
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Then came the Advent 300 receiver. The phono preamp [design] was the result of my comparing tube and transistor preamps and finding that the transistor preamps of that era were clearly not as good as the tube ones. I found a measurable difference which correlated with what you could hear, which was principally the input impedance interaction problem. I came up with a transistor design that would be, of course, more stable and more quiet than a tube design, yet emulate the good properties of the tube designs in low interaction with the cartridge and freedom from spurious due to warp wow, and the like. [The 300] did well, of course, and all the time I was also working with Andy Peirce on loudspeaker designs. I worked with him in the development of the Advent 3, the re-do of the Advent loudspeaker, the smaller Advent, etc. I learned from that.

Thomas J. Norton: And then you left Advent.
TH: Right. I left just a few months after Henry did and started Apt Corporation in '77, to do the same thing as Advent was doing, except on a more rarefied level, on the level of a separate preamplifier, something which Advent would never do. . . [The preamplifier] did very well. It captured some 30% of the market for its era, the late '70s.

TJN: A friend of mine in Berkeley has one of the original Apt preamps. He bought it used for $100!

TH: Oh, my God!

TJN: He had it serviced for $200, including a new front panel. For $300, he has a preamp that I'm sure he couldn't touch for $300 in today's market.

TH: That's great. I still have SN#1 and SN#10,000. Those are the ones I use in San Francisco and LA. Ten thousand serial numbers apart—you know, that I am proud of; they're built a little differently but essentially they work the same.

TJN: I believe you also developed a power amp at Apt.

TH: That's right. The [design of the] power amp was the result of a look at many properties of many amplifiers into many loudspeaker loads. As an amplifier designer, making a black box is a very difficult task because you never know what people are going to hook up to it. If we could only guarantee what they would hook up to it . . .

2 Now the creative source at Boston Acoustics. —JA

TJN: Only this speaker, not that one . . .

TH: . . . the task would be so much easier. So a lot of things that people find about amplifiers, you can see they may well be hearing something that's quite real, but it only occurs with a particular amplifier and speaker combination.

Both the preamp and the power amp both have as their reason for existence the fact that many things may work well by themselves but don't work well in combination. And it's where the sensitive ports in the system are—the phonograph cartridge to the preamplifier, the amplifier output to the loudspeaker. Those are the most sensitive places in the system but the ones that we leave up to the user. Actually, if you were to think about it, you would have the phonograph cartridge maker produce a preamplifier which went in the base of the turntable, and you would then have a very insensitive connection between the turntable and the preamplifier, but in fact, no, we choose to do it a different way.

TJN: We do it the hard way.

TH: And we do it that way because the expertise for building each of those ports is so separate; it hardly arises in the same place at the same time . . .

TJN: Unfortunately the best cartridge designers are not the best electronics designers are not the best speaker designers.

TH: . . . and it's kind of unfortunate, because it leaves the consumer to try to sort this all out himself.

TJN: You were hired, I understand, by Lucasfilm to head up the engineering of their post-production facilities.

TH: Right. Post-production of motion pictures is heavily weighted toward sound. There are about four stages in production—there's pre-production where you work on scripts and getting sets together, and that sort of thing; then you go off and shoot it, that's called production. Then there are two steps that have to happen after that. All the optical special effects have to be made, which is quite a large task that ILM does. 3 Post-production is considered to be picture-editing and sound gathering, librarying, editing, mixing, and all the technical processes that have to go on. So post-production is very heavily sound-oriented.

TJN: And your duties now are primarily in the same area?

3 ILM (Industrial Light and Magic) is the special effects arm of Lucasfilm.
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Lucasfilm gave me an opportunity in the early '80s to look at the whole film-sound chain. What I found was very uneven quality.

Things were pretty grim through the '60s—the typical mono theatrical 35mm release print was such a bandpass filter for quality that there wasn't much point in working on it.

TH: You might call me a technical gadfly, in essence, because I work on a whole lot of different things; the only umbrella I can put them under is that of what I call "Emerging Technology." Lucasfilm gave me an opportunity in the early '80s to look at the whole film-sound chain, from what got recorded on the set to what was heard in the theater. What I found was very uneven quality among parts of the chain. There were certain pieces of equipment that, although they were old, were still the best pieces of equipment in the whole chain. Whereas there were some other parts that were just so backward that it just didn't pay to seem to want to work in the business.

Because of the very severe technical limitations of the soundtrack itself, it didn't call for great things in the theater. It was the improvements in the release format medium that Dolby had made that made it worth working in the field. Once the medium had been cleaned up, there was this need to improve all the steps of the process, and the theater sound system is the one I chose to work on at first. You couldn't work on all of it at once... It's really a comprehensive thing, some of which becomes visible to the public as a product like THX, but much of this [improved] transparency is not known to the public. [For example], we've made improvements in the film sound stock. Dolby SR [noise reduction] is now used routinely throughout post-production, through those five generations of analog we talked about.4 There's quite a lot of hard, plain audio work that has to go on to make it all as transparent as it is.

TJN: There was a brief period in the '50s when studios seemed to be interested in film sound.

TH: That's right. As soon as they perceived a threat from television. Cinemascope was a very old idea. It was invented in France—I don't remember the date, but it was the teens or '20s—and yet it couldn't find an audience until television caused competition. Stereo sound, of course, had really been invented in the US by Bell Labs in the '30s, and could easily have been applied to film in the '30s. Of course the war intervened, but still, they would not have put stereo sound on film except for their need to fight television. But once it was seen that the big spectacle picture—like the The Robe, Ben Hur; and South Pacific—was not going to be a continuing weekly event, then the research and development essentially stopped. As far as I know, the last studio sound research department had closed down by 1957, and things were pretty grim through the '60s. You'd have the occasional spectacular, Lawrence of Arabia or something, where someone would take some care because it would wind up as a stereo mix on 70mm—but the typical mono theatrical 35mm release print was such a bandpass filter for quality that there wasn't much point in working on it.

TJN: It occurs to me how one development tends to drive another. The first extended use of stereo sound on film was in the early to mid '50s, and the development of home stereo—the introduction of the stereo LP in 1958—was pushed by the development of stereo sound in film. People decided they wanted the same thing at home.

TH: That's possible, because the best recorded sound by far you could hear in the early '50s was in the motion-picture theaters. Certainly Cinerama was better than home hi-fis of the early '50s.

Dolby film sound... would never have become popular had it not been for two pictures—Star Wars and Close Encounters.

4 During the tour.

Stereophile, October 1990
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TJN: As you mentioned, it was Dolby Labs who brought film sound out of the doldrums.
TH: That's right. From '72 through '77. But there's something else that happened that was very important. It would have been a lovely technical piece, but would never have become popular had it not been for two pictures, really. Star Wars and Close Encounters made sales [of theater Dolby sound equipment] take off.
TJN: The filmmakers figured out that there's money in sound.
TH: Right [both laugh]. And a real revolution, starting with Star Wars in '77, which is what got me interested. Empire came out in 1980: within a month of that, I interviewed here.
TJN: You said, "I want to be involved with this..." Did the development of THX actually begin with the development of the film screening room here?
TH: Yes. Because our first room—which is not here at the ranch, but in San Rafael—was built to try out the kinds of technologies we would use here at the ranch. The things I wanted to work on most were to throw out those old consoles and use more modern, better-sounding consoles with film features, etc. But the theater sound system was just so bad that we wanted to start from scratch.

THX is not so much a single invention (although there is a patent on part of it) as it is a compilation of work that many people did over many years. A lot of theory was developed through the '70s, especially in Europe, about speech intelligibility and about the influence of reverberation time and background noise on speech intelligibility. And, of course, in a film sound system, as opposed to a music-reproduction system, speech intelligibility is paramount. It's not the same thing as "quality," but if you can't hear the words you can't get the story, so it has to have a very high priority in what you want to do.

So part of the development of THX was a greater understanding of room acoustics and their influence. There had been rules of thumb, of how to do things, which came from Leo Beranek, in his book Acoustics, published in 1953 or '54. Beranek essentially had gone around and surveyed a lot of spaces; he said, well, this is the right reverberation time for an opera house, this is right for a concert hall, and this is right for the cinema. He was making a standard by codifying practice. But there's another kind of standard which looks at not the average of the existing practice, but rather at what ought to be. Beranek's data in Acoustics show that the reverb time of our-size room should be 0.9s. "That's pretty long," I said.

But there's another kind of standard which looks at not the average of the existing practice, but rather at what ought to be.

Beranek did [his research] as stereo film sound was just coming out. He was basing it on live speech rooms, because a lot of the theaters of the time were vaudeville houses that had been converted. They weren't cinema purpose-built. I'd like to have a shorter reverb time because I know that long reverberation smears together syllables of speech, because I know we can record reverberation spatially onto a soundtrack today that they could not have done at that time. So let's back nine-tenths of a second down to, say, half a second, and see whether or not this does give us greater localization of sound effects and dialog. It wound up, of course, that it did.

So it was a kind of re-examination, a pulling together of a lot of different technologies and trying to blend them very well together. Following the same idea as reverberation control, we wanted a sound system that for the screen speakers produces a lot of direct sound, uniformly covering the audience, but not a great deal of extra sound energy toward the ceiling or sidewalls. It's not a concert. That's the difference between a cinema and a concert hall—the concert hall is a very real part of the acoustic of the event. But in a cinema you're trying to reproduce what's on the soundtrack.

The concert hall is a very real part of the acoustic of the concert. But in a cinema you're trying to reproduce what's on the soundtrack.
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It's not a desirable thing to play a film in a concert hall, just like it is undesirable to play live music in a cinema, without sufficient reverberation.

**TJN:** For those of Stereophile's readers who are not into film sound, it should be quite clear that Dolby and THX are not mutually exclusive technologies but complementary.

**TH:** Absolutely. Dolby concentrates on the format that's on the film, both 70mm and 35mm, and at recovering that as best as possible off the film. And on certain other practices, like equalization for the theater, that can be done basically within the context of one package of electronics in the booth. THX takes the output of the Dolby system; uses an electronic crossover with a lot of interesting features in it to feed bi-amplified loudspeakers—the only system in widespread use that is bi-amplified, for all those known good reasons. It specifies the local acoustical environment of the speaker—which has to do with diffraction about the speaker and precisely how it's mounted, how it deals with the screen and the room boundaries close to it—and the global environment of the room, the intrusive noise, the background noise, the reverberation, the echoes, reflections. It's more difficult than Dolby, therefore, because it isn't just a package of equipment that's shipped out to somebody. We actually have to go out to the theater and measure these things, measure background noise, etc., and custom-do each theater.

**TJN:** The equipment itself, the amplifiers and loudspeakers that are supplied by outside suppliers—do you actually do certification in a similar fashion, say, to the way Dolby Labs does cassette decks and other equipment that bears the Dolby logo?

**TH:** We do an extensive amount of testing of the drivers, of the loudspeaker boxes, of the power amplifiers, etc. These are sort of torture tests for power amplifiers we have, and that some famous-brand amplifiers have not passed! We fail about about 30% of the amplifiers submitted to us.

**TJN:** The cinema is a somewhat different environment for a 200Wpc amplifier than the home.

**TH:** Yeah, except that here it's different from designing an amplifier for home use because we know precisely what the load impedance is going to be and we actually test it into that specific load impedance. We're not having to drive 1 ohm speakers or anything like that. **TJN:** Your typical load impedance would be fairly easy for the amplifier to drive.

**TH:** Well, compared to more exotic speakers, I'm sure that it is. It's everywhere above 6 ohms and there's some fair amount of reactance, but that's not particularly a problem.

This is one of the reasons why power amplifiers fail. We literally had a famous American power amplifier maker tell us, "What do you mean, you test it into loudspeakers? We only test it here into resistors." I couldn't believe it! It's such an old story.

"What do you mean you test it into loudspeakers? We only test it here into resistors." I couldn't believe it!

**TJN:** What are you specifically looking for in an amplifier other than driving the load?

**TH:** Number one, for every amplifier I look at the schematic. I try to come up with a torture test for that topology that will reveal any defects that it might have. So every one is [checked on] a case-by-case basis. Number two, we do about 20 tests that aren't in the textbook. We look at the manufacturer's tests; if he's got the same equipment we do, theoretically he's testing the same things. Largely we believe the published specification unless we know some reason not to believe it.

Then we look at other factors. Things that are in my papers on power-amplifier design, like asymmetrical waveform performance and behavior into a reactive load, specifically our reactive load—not that reactive, not that hard to drive, yet we still find a lot of problems with it. Difficulties with DC stability in the presence of, let's say, a clipped asymmetrical tone burst, and it can cause some bobbling around after that. Some recovery-from-overload types of problems. We actually size the power amplifiers in a THX installation so they'll never clip—the film will give up the ghost first. But still, you have to think that some day, under some circumstance or with some future format, maybe that power amplifier will be clipped, and in that

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5 THX cinema installations use a variety of certified commercial products.
case it has to behave beautifully. A number of factors like that.

**TJN:** And at the loudspeaker end? That’s obviously the more problematic area for equipment that you choose to use with THX.

**TH:** That’s right. What we did was start by surveying the market and choosing the best available components at the time. That’s easy. What’s hard is coming up with how much tolerance you will permit on their performance, because there can be changes in the performance that are measurable that are not especially audible, and other units will not perform absolutely identically. So we measure many factors about the loudspeaker: its on-axis performance, its off-axis performance at many angles, its distortion performance in a whole new way.

We used Dolby Laboratories’ Louis Fielder’s data6 to develop this test: we put out different sound pressure levels—80dB, 100dB, 110dB spl—at a number of different frequencies. And for each of those frequencies, we take a spectrum. (This spectrum goes all the way out as far as it needs to go, 25th harmonic if need be.) We then look at this spectrum of harmonics generated by distortion in the speaker, and we compare it to the masking curve that a human listener has for that level and frequency. What we find, of course, is that the lower orders of distortion, the 2nd and 3rd, are much less relevant than the very high orders, like the 20th. And this can relate to actually rather small details in the way the driver is made. The way air swooshes in and out of the gap, or factors such as that, can produce audible high-frequency whirlies, let’s say, that are a lot more important than the simple suspension-linearity problems of the lower-order harmonics.

By adding up all of the harmonics that lie above masking in an amount which is how far they are above masking—let’s say the 2nd harmonic’s below masking, the 3rd harmonic’s above masking by 5dB, and the 5th harmonic’s above by 10dB—we add 5 and 10 to get ‘15dB distortion.’ We’ve now done this test on dozens of speakers and we’ve gotten between 0dB and 200dB, 200dB distortion! The largest number

known to man—whoever heard of 200dB! But add all those harmonics up above masking and you’ve got 200dB. But there are some speakers that at every frequency and level we’ve tested them have distortion inaudible to a human ear. These are direct-radiator type, vented-box designs. And that’s quite remarkable—big achievement.

There is a problem in big sound systems that everybody who attends rock concerts ought to know—besides that you might damage your hearing—which is that when you add that many speakers together the uniformity of coverage gets terrible. You have terrible, terrible lobes from the spaced sources. And so we try to minimize the number of sources as much as we can, to get the uniformity good. So for example, Mann’s Chinese Theater [in Hollywood] is served by one center-channel horn. That driver has to be very good, very capable of going to quite a high level without audible distortion problems. That is a very tricky thing. We’ve tried two in there, and the uniformity gets very poor. There may be other ways around it that have not been developed, but it’s really the reason I haven’t worked with large public-address systems with many, many, many drivers. It’s kind of an unsolvable problem. It’s never going to sound very good except in one place; you move 5’ and it’s all going to be different.

**TJN:** What were your objectives compared to the older cinema systems?

**TH:** We wanted to extend the bandwidth, because those older systems were basically 80Hz–8kHz systems. They would stay on some reasonable curve but fall off away from that curve above and below that region. That was one of the requirements. The second requirement was much lower distortion, because those older systems had quite high distortion, even though they were horn-loaded. And a third was the uniformity of coverage, which is very important to us because we’re trying to produce an egalitarian experience. You know, you’re trying to be as equal as you can for everybody in the theater so that it’s not a sweet-spot type system. That’s a big concern. To do that we chose a kind of unorthodox combination of technologies: a vented-box low-frequency system and a horn-type high-frequency system.

Now I had the same prejudice before I came to this industry that a lot of audiophiles have

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Stereophile, October 1990
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about horns, about their narrow bandwidth and such, but there had been quite a lot of developments in both compression drivers and in high-frequency horns that hadn't been applied to the industry yet when I started. So I started looking into this. One of the things I did was an A/B comparison between a high-quality, nearfield, home high-fidelity type of loudspeaker and the farfield THX system, to get the timbre as closely as possibly the same so that we wouldn't have any honk. And it will pass that A/B. I used different people's theoretically best speaker, your choice of whatever you choose that to be. You compare that in the nearfield to the farfield THX system and you can come very, very close.

I should talk about the dispersion [of the screen speakers]. As you know, I was from a high-fidelity background where it is axiomatic that wide dispersion is a good thing. But I did an experiment in a dubbing stage that I could hardly believe the results of, which was to compare two similar-technology, three-way speaker systems, three of each (left, center, right), in an A/B comparison, level- and amplitude-matched. This is hard. This is like a hi-fi store A/B comparison with an equalizer. You EQ it until it sounds as close as possible and then see what else is left. This takes days to set up. When we did this A/B, I expected the wider-dispersion speaker always to be better because, you know, the axiom was to be upheld.

It wasn't true. We used a scene from Apocalypse Now, with people shouting from different directions and gunfire and everything else going on. With the narrower-directivity speaker, it was easier to hear dialog in the presence of interfering noise sources. It seemed simply to be easier to hear dialog in the case of loudspeakers which only covered the audience, so that's why the screen speaker was designed only to cover the audience in the THX system.

TJN: You go to a lot of effort behind the screen to maintain low-frequency response.

TH: We found that the Thiele-Small parameters, which are the ones that allow engineers to use electrical engineering theory to basically design loudspeaker boxes, had the underlying assumption that the speaker was lying flush-mounted in half-space. In fact, most loudspeakers are not used that way. So it became essential, and it made a lot of difference in low-frequency smoothness and power handling, to build a baffle to flush-mount these loudspeakers into. The crossover? is also very important because we're trying to match these two disparate technologies—the vented box and the horn—and you have to do that by juggling many factors. But by doing that juggling, you can come up with something that's just absolutely seamless. Where the amplitude and phase measured through that region is so smooth that you cannot tell where the transition is, so there are no little jumps in time and phase and amplitude, or anything else. But that's fancy crossover technology.

TJN: Do you have any special requirements for surround speakers?

TH: Yeah. When it comes to these, my first thought in 1981 was that we were trying for a whole different thing than we were trying with the screen speakers. We were trying to produce a delocalized spatial soundfield to envelop the audience in sound. To do that, we wanted to minimize loudspeaker localization. To do that, what you want is a non-directional loudspeaker, basically. I started out with flush-mounted Boston Acoustics A200s in the walls, a wide-directivity type speaker, just to try to delocalize the sound as much as possible. And I still believe in that, although I've learned some interesting things.

Film sound has a standardized level and frequency response. That frequency response is standardized at the listener's ears, measured with specific techniques. This means that timbral differences that occur between different speaker systems are largely ruled out as reasons to buy one system over another, or at least they should be. It's a very interesting part of film sound because you're trying to reproduce an experience designed under standardized conditions. Of course, all us engineers try to make these standards work, but there's another great forcing measure which is the Academy Awards, because all the Academy Awards for sound are judged under the same standardized conditions. The one that sounds best wins the Academy Award. So everybody tries to achieve these standards. Well, that's very different from a music recording where you don't know what the producer was listening to, what directivity loudspeaker, what frequency response, you haven't a clue. You're only trying to make a recording sound "good." You don't have an

7 The crossover, the only part of the system manufactured by Lucasfilm, is leased to THX theaters.
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In 1979, Goldmund razed standards
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with the
Studio Turntable and T3 Tonearm...

...In 1990, Goldmund turntable systems
remain unsurpassed, and
Meta Research by Goldmund
raises the standard for CD playback accuracy
with the
Laser 1 Transport
and
Convert 1 D/A Converter.
TJN: Film sound, recording and playback, is more analogous to a pop mix than standard classical recording would be.

TH: Well, possibly, because there are many elements. We like to think of it as wider dynamic range, wider frequency range, and you know, more beautiful sounding than a lot of pop mixes.

TJN: Are you still getting good penetration of new THX theaters opening up around the country?

TH: I think so.

TJN: I noticed in the listing in your article in Audio a few months back that the heaviest concentrations seemed to be in California and Texas.

TH: That's true. Some markets are faster-moving than others. And theater building is down compared to a few years ago, so it's more difficult now.

TJN: I was interested to note that there were no THX-certified theaters in New York City [as of September 1989].

TH: New York City is an enormous problem because there is so much subway noise and other problems in those theaters. We have a screening room there, Robert Di Niro's Tribeca Studio screening room is THX. That's a professional site. I think there are some on the boards or underway, I'm not sure if they're open yet or not.

TJN: Is the concept behind the Home THX system similar to what you're trying to achieve in theaters? And bow is it different?

TH: Well, it's kind of a scaling of the same ideas. The primary idea is that this was an experience of the film designed by a filmmaker under standardized conditions, and ought to at least be given a chance to be played back the same way. When I first went to CES in 1986 and went around to all the surround-sound demos, I thought they were terrible because none of them represented anything like what those films sounded like.

Things have gotten better in the marketplace since 1986, it's true. But I was also able to develop some proprietary technology to help in general to improve the quality, but especially to improve the transfer. I liken this to an art museum. Let's say that an art museum decided they were going to illuminate their best Impressionist paintings with sodium-vapor light. How long would the public put up with sodium-vapor light on a Degas painting? They would want a light which was rather like the light that the painter had available when he painted the painting—north skylight, say, for its known artistic properties. I think film soundtracks are rather the same. They've been made under standardized conditions; we know a whole lot about those conditions, and we assiduously follow the rules so that the film can translate from room size to room size.

You've seen our different room sizes [at Skywalker Ranch]. We try to make those rooms sound as identical as possible. That piece of art, that film, dubbed under those conditions, has a chance to be played in your home as close to the same as it is possible to do. The same loudness, the same spectrum, the same localization, the same uses of directivity, and the like. That's what Home THX is all about. It's very different from Dolby Stereo, which is about recovering four channels' worth of information in a fairly transparent way from only two tracks available on the medium. It's easy to decry the fact that it would be nice to have more tracks, etc., but the video boys always seem to be winning out on bandwidth and tape utilization, and space on laserdiscs. Video is so consumptive of space that there's not much space left for audio. It's kind of interesting: all that scales from film, where there's only about 10% of the space given to the soundtrack and 90% to the picture. Pretty interesting.

TJN: So you'll be certifying products in a similar fashion to the way you do for theaters?

TH: That's right. There'll be a logo kind of program that tells you that they made use of these developments, and that here's a chance to get closer to the original experience. The final customer can do whatever he wants, of course, with the volume control in his home.

TJN: You're not going to have the video police come by his house and make sure that it's set up right? "Knock, Knock. . .

TH: . . . What's the background noise level in there?" [laughter] No, we can't go that far, but we can at least provide the user with an indication of where the original volume was, and we can come as close as it's possible to come

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8 I understand that, as of the summer of 1990, there have been a number of NYC theaters THX-certified.
to the spectral balance, etc. None of that’s being attempted right now.

**TJN:** Will Home THX in any way attempt to address any of the special acoustical problems for the home, and how they vary from how the movie was designed to perform in the theater?

**TH:** You have certain advantages at home. You’re working in a much smaller space which is less likely to have problematic echoes and reverberation. Home rooms are unlikely to have very high noise levels. They don’t have to have huge air-conditioning systems, or if they do, you watch the movie at night and turn off the air-conditioner. It’s under the user’s control. There is another set of problems which comes up, which a bunch of people are working on, which is that the influence of the room modes is much more prominent in a small room than in a big room. There’s quite a lot of work going on in this area using DSP [digital signal processing] technology in Europe, Canada, and Japan—somebody’s going to get that right one of these days, and I’ll be happy to adopt it.

In the meantime, what we can do is provide information to people about the things that are in general good to do. Choose the dimensions of your room. I bought my house before I calculated the room modes of my living room, but once I did buy it, I calculated them. I happened to luck out with a fortuitous combination; it’s quite smooth in the bass. But if you’re building a room from the ground up, you would have it designed by an acoustician to have a certain bass smoothness... I think we will be moving toward improvements with digital techniques that really can’t be done practically in analog. Digital will really shine—it already has shined in storage media—in signal processing. Building a digital preamp doesn’t interest me very much if you’re just making digital tone controls because you can get more dynamic range out of a cheaper analog circuit. Why do it? But if you’re doing something you can’t do at all with analog—I’ve always been one not to start out with the choice of technology and then try to apply it to a problem but rather look at the problem and see what technology is the best one to solve the problem.

**TJN:** What do you see the future holding?

**TH:** I see most of the job right now as one of diffusion, of basically getting Home THX out into the marketplace and doing the job well. On the other hand, I don’t want Pro THX to get the in same position as its predecessors and be a fossil waiting to be knocked off by the next major revolution. It should be evolutionary and take advantage when audible improvements can be evoked. And I think some of the more interesting areas to work in—now that these systems are big, and capable of wide dynamic range, wide frequency range, uniform coverage, all these things—are the psychoacoustic ones. How do we make a “distance” control? Every mixer would love to have a knob—you know the knobs he has are labeled equalizers, reverberators, etc. No one has a knob that says Near/Far. Sure, you can add more reverb, but beyond that, there’s quite a lot to learn there.

How do we make a “distance” control?

No one has a knob that says Near/Far.

Another thing that interests me, a topic I’m working on at the University, is production sound monitoring, because these guys wearing earphones on sets have a terrible time telling what it is you’re going to hear in the final mix or in the dailies the next day, for that matter. They learn a translation scheme, from what they hear in the headphones to what they hear in the theater, but it’s a very difficult learning task. I’m starting some work in that area because it’s such an important one.

The day after the interview, I capped off my visit by going to see a THX 7.1mm presentation at San Francisco’s Kabuki Theater. (The film was _Mountains of the Moon._) Though the sound was very good, it was not the best THX presentation I’ve heard. The most annoying flaw was an unnaturally bright vocal track. As Tom Holman had pointed out the day before at the Ranch, the THX system is still dependent upon the judgment of (and the facilities used by) the recording team—it’s very much at the mercy of the program source.9 In that, it has something in common with our attempts to get the best possible audio-only reproduction in the home.

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9 While it’s true that the system is designed to bring to the theater the same sound heard by the director in the final cut, that ideal is only approached if the post-production is done in standardized recording environments; _ie_ , those at Lucasfilm.

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Stereophile, October 1990
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Components listed here are ones which we have found to be among the best available in each of four quality classes, and whose purchase we highly recommend. Following each listing is a brief description of the product’s sonic characteristics and a code indicating the Stereophile Superlog Issue in which the product first appeared.
Some products listed have not yet been reported on; these are marked (NR). We recommend that any product’s entire review be read before purchase is seriously contemplated (products without reviews should therefore be treated with more caution); many salient characteristics, peculiarities, and caveats appear in reviews, but not here. To obtain back issues of the magazine, see the advertisement in this issue. (We regret that we cannot supply photocopies of individual reviews.)

In general, discontinuation of a model precludes its appearance here. In addition, though professional components—recorders, amplifiers, monitor speaker systems—can be obtained secondhand and can sometimes offer performance which would otherwise guarantee inclusion, we do not generally include such components. Apart from that exception, Stereophile’s “Recommended Components” listing is almost exclusively concerned with currently available products offered through the usual hi-fi retail outlets.

**How recommendations are determined**

The ratings given components included in this listing are predicated entirely on performance—*i.e.*, accuracy of reproduction—and are biased to an extent by our feeling that things added to reproduced sound (flutter, distortion, various forms of coloration) are of more concern to the musically oriented listener than things subtracted from the sound, such as deep bass or extreme treble. On the other hand, components markedly deficient in one or more respects are downrated to the extent that their deficiencies interfere with the full realization of the program material.

We try to include in “Recommended Components” every product which we have found to be truly excellent or which we feel represents good value for money. Many different tastes are represented. The listing is compiled after extensive discussion among Stereophile’s reviewing staff, editors, and publisher, and takes into account continued experience of a product after the formal review has been published. In particular, we take account of unreliability and defects that show up after extended auditioning. The fact that a product received a favorable review can’t therefore be regarded as a guarantee that it will continue to appear in this listing.

We indicate products that have been on this list in one incarnation or another since the “Recommended Components” listing in Vol.10 No.8 (November 1987) with a special symbol: ★. Longevity in a hi-fi component is a rare category. Bear in mind that appearance in Class D still means that we recommend this product—it is possible to put together a musically satisfying system exclusively from Class D components. Below this level, system colorations start to become so great that guidance becomes almost impossible and any recommendation is out of the question.

**Class K:**

“Keep your eye on this product.” Class K is for components which we have not tested (or have not finished testing), but which we have reason to believe may be excellent performers. We are not actually recommending these components, only suggesting you take a listen. In certain cases, though the report has yet to be published, the reviewer and Editor feel confident enough that the review opinion is sufficiently well-formed to include what otherwise would be a Class K entry in one of the other Classes, marked (NR).

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**Class A:**

Best attainable sound, without any practical considerations; “the state of the art.”

**Class B:**

The next best thing to the very best sound reproduction; cost is a factor, but most Class B components are still quite expensive.

**Class C:**

Somewhat lower-fi sound but far more musically natural than average home-component high fidelity; products in this class are of high quality but still affordable.

**Class D:**

Satisfying musical sound but significantly lower fidelity than the best available. Many of these products have obvious defects, but are inexpensive and much better than most products in the price cat-
enough commodity that we felt it worth indicating (although, as in the case of pickup cartridges and separate MC head amplifiers, it can apparently indicate that the attention of design engineers has moved elsewhere).

We are not sympathetic toward letters complaining that the Symphonic Bombast A-123 Mk.IV, which we recommended heartily two years ago, no longer makes it into "Recommended Components" at all. Where deletions are made, we endeavor to give reasons (there always are reasons). But remember, deletion of a component from this list does not invalidate a buying decision you have made.

How to make use of the listings
Read carefully our descriptions here, the original reviews, and (heaven forbid) reviews in other magazines to try to put together a short-list of components to choose from. Carefully evaluate your room, your tastes, your source material and front end(s), your speakers, and then yourself: with luck, you may come up with a selection to audition at your favorite dealer(s). "Recommended Components" will not tell you just what to buy, any more than Consumer Reports would presume to tell you whom to marry!

Turntables

Editor's Note: Any audiophile worth his or her salt (unless they are exclusively committed to CD) should consider at least one of our Class D recommendations or, preferably, one of the Class C turntables and their variants as the essential basis of a musically satisfying system. An in-depth audition as part of a preferred turntable/arm/cartridge combination before purchase is mandatory: The point should also be made that these are lean times for turntable manufacturers—"Buy while you can" is Larry Archibald's advice. If an inexpensive turntable has not made its way into Class D or is not listed in Class K, do not assume that it is recommended by default. Underachievers are more common in the world of turntables than in any other area of hi-fi.

A

Versa Dynamics 2.0: $12,500
Incongruous vacuum holddown, air-bearing, suspended-subchassis turntable with integral air-bearing tonearm. JGH felt the complete player to give the "best sound from analog disc" that he has heard, particularly in its presentation of silent backgrounds and tight low-bass response. Only drawback is the need to house the air-pump module—for once not a reworked aquarium pump—in a separate room. A noise-reduction housing for the pump is now included in the purchase price. Despite a report in April 1990 that the 2.0 was no longer in production, this does not appear to be the case—see the letter from Versa's John Bicht in Vol.13 No.9's "Manufacturers' Comments." (Vol.10 No.8, Vol.11 Nos.1 & 4)

B

Goldmund ST4: $5690
Martin Colloms's long-term reference, this integrated turntable/parallel-tracking arm LP player offers an almost unrivaled combination of speed and pitch stability, midband neutrality, and inner musical balance and drive. (Vol.13 No.3)

SOTA Cosmos: $4000
A more contrapuntal sound than the SOTA Star, thought TJN of the Cosmos, with greater inter-transient silence. The subjective result was that small details were better resolved with the more expensive turntable. The low end, too, betters the Star regarding detail and clarity. TJN did feel, however, that using the supplied SOTA "Groove Damper" mat led to a small loss of openness, "a slightly more closed-in sound that tempered that feeling of an unrestricted top end that is one of the Cosmos's principal strengths." A high-gloss black finish adds $500 to the price. (Vol.13 No.7)

Space & Time Aura: $4650
The only recommended turntable to conform to the Oriental high-end norm of coupling a high-mass platter on a sprung subchassis with a separate, unsprung motor tower, the beautifully finished Australian Aura impressed DO with its ability to enable the arm and cartridge to throw a deep soundstage: "Borderline Class A!" quoth he, though the Aura didn't quite match the Versa 2.0 in this respect. Dynamics, too, he felt were effortless, with musical peaks contrasted against an astonishingly quiet, velvet-black background. Works well with the both the SME V and the Graham tonearm. (Vol.13 No.4)

VPI TNT: $3300
Sophisticated belt-drive turntable with two idler pulleys in addition to the motor pulley to give a more even belt tension. "Soul" was an ingredient that TJN felt impelled to mention as being part of the big VPI's sound, as was "midrange liquidity, with a self-effacing high-frequency sweetness." The sounds of the cartridges and arms he used became a little richer on the VPI! when compared with their sounds on the SOTA Cosmos and Star. Compared with the sound of the standard VPI HW19, the TNT features a greater degree of palpability: West Coast price is $3400. A dust cover and dedicated stand add $1100 to the price. (Vol.13 No.7)

C

Linn Sondek LP12: $1165 *
The standard against which newer turntable designs have been measured for 15 years now, the Linn is felt by some to be more colored than the other Class C tables (particularly in the upper bass). Latest version has a laminated armboard which, with Zener mods to the Valhalla board, results in a considerably more neutral sound. Certainly it is harder to set up and more likely to go out of adjustment, though with the latest springs and glued subchassis, it is now much better in this respect (low-bass extension suffers when the LP12 is not set up correctly). Superbly low measured rumble and excellent speed stability reinforce the feeling of musical involvement offered by this classic turntable. Good isolation from shock and vibration—essential in view of the fact that JA's cats like to use his LP12 (with the lid down) as a springboard to jump on to the equipment cabinets! (This application is not
recommended.) While the felt mat doesn't offer the greatest degree of vibration suppression within the vinyl disc, what absorption it does offer is uniform with frequency. Despite flirtations with other decks, JA remains true to the basic design he has used now for over 12 years. As an integrated system, with Linn's Ekos tonearm and Troika cartridge, approaches Class B performance overall. A version with a separate power supply is rumored to be launched this Fall. (Vol.7 No.2, Vol.13 No.3)

Roksan Xerxes: $1800

Unusual but well-made design that eschews a conventional sprung suspension for a semi-rigid construction. Easy to set up and align, therefore, but a stable support essential. Excellent pitch stability, though the bass is a little lightweight. Provides a firm musical foundation for the SME V, Rega RB300, and Eminent Technology ET Two tonearms. (Vol.13 No.3)

SOTA Deluxe Star Series III: $1795 ★

A synergistic match with the SME Series V tonearm, the Series III Star, complete with the acrylic Supermat, is significantly better than earlier versions, due to its use of an aluminum armboard, new motor drive pulley, new suspension springs, and ribbed platter construction. Compared with the standard SOTA Sapphire, the vacuum holddown significantly improves bass range and detail, as well as resolution across the audio range. The basic SOTA Sapphire at $1350 lacks vacuum disc clamping—the Series II Reflex clamp is supplied as standard—but is easy to set up and use, attractive, ingenious in design, and sonically excellent. (Vacuum clamping is available as a $695 upgrade.) The "Groove Damper" mat now supplied as standard, costs $40 as accessory. The SOTA "Electronic Flywheel" line conditioner ($300, Vol.9 No.2) improves performance very slightly further. If you find the cost-no-object "super-decks" tantalizingly out of reach, JGH recommends that you set your sights on the SOTA Deluxe Star: "The best turntable performance you can buy for anywhere near its cost," quoth JGH, though it must be noted that LA, LL, and JA find its sound a little uninvolving compared, for example, with the Linn, Well-Tempered Table, or VPI. (Vol.10 No.5, Vol.11 No.1)

VPI HW-19 III: $1200 ★

The Mk.II version of the VPI table, cosmetically more elegant than the original, achieves a standard of sonic neutrality that puts it close to the latest SOTA Star Sapphire, and at a significantly lower price. The HW-19 readily accommodates a wide range of tonearms—the ET 2 air-bearing design in particular—and is very stable. The $300 Power Line Conditioner (see Vol.12 No.2) is a worthwhile accessory. (Vol.8 No.4, Vol.9 Nos.4 & 9, Vol.12 No.11; see also Vol.13 No.7, p.112)

Well-Tempered Turntable: $1795 (Inc. arm)

An integrated belt-drive turntable/tonearm combination featuring an acrylic platter and a unique four-point wobble-free bearing. Lacks a suspension, but designed with attention to detail, particularly concerning the maximizing of speed stability and the rejection of motor noise. Most obvious sonic characteristic is stability, both in speed and harmonic structure, coupled with cleaned-up sound quality: "The quiet between the notes is suddenly more silent," said AB in his review. In addition, dynamics seem to be enhanced, though the sound is more lightweight than that of, say, the VPI. Only significant drawback, as far as mix’n’matchers are concerned, is its dedication to the Well-Tempered Arm. No other can easily be fitted—we've had reports that the Wheaton works well—but it’s available w/o arm for around $1000. (Vol.11 No.3)

D

Acoustic Research ES-1: $550 ★

Although an increase in price means that it is no longer the bargain it once was, this is still a turntable we can heartily recommend. Compared with the original AR, this has much better cosmetics, comes with its own arm (for $725), or can be fitted with yours—Sam Tellig just loves the AR with either the Rega RB300 or the SME 309, while Guy Lemco enjoyed the sound with the AudioQuest PT-5. Intrinsic character is a bit fat in the upper bass, but is nevertheless musical. Availability is limited, but The Audio Advisor has supplies. The AA's metal armboard should be regarded as mandatory (Vol.11 No.4), the Anarchist then feeling the sound with a felt mat to be Class C and rivaling the Linn LP12. Merrill’s modifications of the Connoiseur are also said to be worth investigating. (Vol.8 No.7, Vol.11 No.4, Vol.12 No.8)

Linn Axis: $795 (loc. Akito tonearm) ★

Versatile, "turnkey operation," two-speed belt-drive deck with electronic speed control and ingenious suspension. "Smaller" sound than the Sondek. Latest version fitted with the new Akito tonearm, which is said to be much improved compared with the original arm. (Vol.10 No.1, original version, but a review of a 1990 sample is underway)

Rega Planar 3: $599 ★

Synergistic mix of no-nonsense deck with superb arm. Lack of environmental isolation may be problematic; some recent reports of variable wow & flutter; limited cartridge compatibility; but a safe Class D recommendation, nevertheless. Can be obtained in a dedicated version for playing 78s. (Vol.7 No.1, Vol.8 No.6)

Sonographe SG3: $595 ★

Better-sounding than the basic AR, the Sonographe may be hard to find. It's worth seeking out. Good value in the armless version. (Vol.9 No.7)

VPI HW-19 Jr. turntable: $600

Well-designed belt-drive turntable featuring an excellent disc-clamping system. No suspension, due to upgrade path to fully fledged HW-19 being incorporated into design. GAG therefore recommends a wall-mounted isolation shelf to get the best performance from the Jr. West-Coast price is $25 higher. (Vol.12 No.10)

K

Basis Debut, Dunlop Systemdek IIIX, Michell Gyrodek, Oracle Delphi Mk.IV and Alexandria Mk.III, Revolver Mk.II.

Deletions

To the best of our knowledge, the Alphason Sonata is no longer distributed in the US.

Tonearms

A

Airtrangent: $3600 (with lift/lower)

Setting a new price level in this listing, this beautifully made Swedish parallel-tracking tonearm distributed in the US by Basis was felt by AB to achieve new standards of transparency, smoothness, and retrieval of detail with every cartridge with which it was used, coupled with the ability to present a "billowing" soundstage and a well-defined
bass. Better in the highs than the SME, it is a little lean in the bass compared with the English arm. It does, however, allow for easy adjustment of VTA and features interchangeable, prebalanced arm-tube assemblies to allow easy cartridge changes. (Vol.12 No.2)

Linn Ekos: $1995
Cleaner-sounding than the Ittok, upon which it is loosely based, the Ekos rivals the SME in overall neutrality while offering a somewhat brighter, more energetic presentation of the music. The treble is nevertheless superbly transparent. The Ekos also provides a much better match with the Linn Sondek LP12 than the English arm, however, which loses control of the bass when mounted on the Scots turntable. Martin Colloms also found the Ekos's bass to be more tuneful and "open" than that of the original Ittok. Azimuth adjustment is not possible. (Vol.12 Nos.3 & 4, Vol.13 No.3)

SME Series V: $2250 ★
Extraordinarily neutral pivoted tonearm, with the lowest resonant signature of any. Easy to set up, VTA and overhang are adjustable during play; but no azimuth adjustment, something that DO feels to be a significant drawback. The best bass performance on the market, says SWW, but JGH and LL feel that the whole bass range is somewhat exaggerated. Certainly JA feels the latter to be the case when used with the Linn LP12. Some compatibility problems with cartridges having low mass, but otherwise the new reference. Very pricey, but ergonomically and aesthetically a work of art. A finish worthy of Tiffany's. A less versatile version, the IV, appears to offer many of the Vs sonic virtues at a lower cost ($1500). (Vol.9 No.6)

Wheaton Triplanar II Improved: $1795
Limited-availability, unusual-looking pivoted tonearm with logically thought-out VTA and azimuth adjustments. While not as neutral as the SME V, and not having as much bass—the balance is on the light side—the latest version of the Wheaton excels in its ability to enable the cartridge to retrieve spatial information and present a detailed, solid soundstage. All particularly recommends the Wheaton for use with the Rowland Complement cartridge. (Vol.11 No.1)

B

Eminent Technology Two: $950 ★
The ET Two corrects its predecessor's cueing difficulties and comes up with a host of ingenious extras, including VTA adjustable during play. More important, it has "an extraordinarily live and open soundstage," according to Anthony H. Cordesman, and gets the best results from a wide range of cartridges. Idiosynchratic nature of low frequencies precludes a Class A rating. Very fussy to set up and use and needs a very stable subchassis turntable—VPI, for example—to give of its best. Martin Colloms also reports excellent performance with the ET Two mounted on the Rotel Xerxes. Surpassed overall by the SME V, which has as neutral a midrange and significantly better bass definition and extension. At less than half that fixed-pivot arm's price, however, the ET Two is an excellent value. Latest version incorporates viscous damping. GL reports excellent results—"almost Class A on the VPI HW19"—with Herb Wolf's modified Mila air pump and surge tank. (Vol.18 No.7, Vol.13 No.3)

Linn Ittok LVIII: $1195 ★
The original Ittok LVII had slight resonant colorations in the upper midrange compared with the best arms, which could add both hardness and a false sense of "excitement." Its bass and lower midrange were still among the best, however, and superior to the similarly priced competition in these areas. New version incorporates refinements based on the Ekos and is significantly more expensive but not yet auditioned: this recommendation must be regarded as provisional. (Vol.8 No.7)

SME 309: $995
Preliminary rating following the Audio Anarchist's continued use of this detachable-headshell arm on an AR turntable. (NR, but see Vol.11 No.10, p.53 and Vol.12 No.12, p.63)

Well-Tempered Arm: $825 ★
One of the most neutral arms available, according to JGH, this odd-looking arm is hard to fault on any count. Superb highs, stereo soundstaging, and midrange, plus excellent compatibility with MC cartridges that put a lot of energy back into the arm. Some deficiency/softness in the low bass and, according to some listeners, an undynamic sound, but virtually no other problems. Good value for money. Removing the armrest, which adds a thickening in the lower midrange when the arm is mounted on the Well-Tempered Turntable (see Vol.11 No.6), further improves the sound, as does replacing the standard counterweight with a more massy one nearer the pivot. (Vol.8 Nos.4 & 7, Vol.9 Nos.3 & 5)

C

AudioQuest PT-5: $350
Medium-mass tonearm with straight aluminum arm tube wrapped in clear polyolefin and non-detachable headshell. Pivot damping optional, while VTA adjustable with setscrew at base, but no azimuth adjustment possible. Works well with AR and VPI Jr. turntables, with which it can be supplied as a package at reduced cost. AudioQuest Sapphire cable adds $95 to price, but should be regarded as essential, says Gary Gait, the sound with the basic cable being rather veiled, if not totally muted. (Vol.12 Nos.8 & 10)

Rega RB300: $299 ★
The Rega offers very good detail, depth, midrange neutrality, ambience, and precision of imaging, almost creeping into Class B. Works well with the Rega and Rotel 'tables, but also recommended by the Audio Anarchist as an ideal substitute for the arms that come with the AR and Sonographe 'tables. (The Audio Advisor offers it as a package with the AR.) Lacks any form of height adjustment, however: VTA can only be adjusted by adding spacers under the base. Even-cheaper RB250 dispenses with the spring downforce adjustment and the sintered tungsten counterweight, but sacrifices little in sound quality. (Vol.7 No.7, Vol.10 No.10)

K

Graham Engineering Unipivot, Moch DP-6, Naim ARO, Souther/Clearaudio.

Pickup Cartridges

A

Benz-Micro MC-3: $1500
Low-output MC from the manufacturer of the van den Hul and Madrigal Carnegie cartridges that TJN thought to be overall the best he had heard to date in his system. Possessing a similar balance to the vdH MC One, the Benz MC-3 offers a slightly more transparent view into the soundstage. (Vol.13 No.3)
Dynavector XX-1: $1000

“Easy on the ears,” said AB in his review of this high-output MC which features a switchable “Flux Dampner.” Soundstaging, too, was an area where the Dynavector excelled, producing “a panorama with quality.”

Highly detailed presentation perhaps slightly offset by a feeling that the sound was slightly larger than life in being too harmonically rich from the upper-bass downward. Benefits significantly from regular “Flux-Busting.” A low-output version is now available. (Vol. 12 No.6)

Jeff Rowland Design Group Complement: $2500

Setting a new upper limit for cartridge price, the high-mass Complement, which lacks any kind of cantilever, also sets a new standard for performance above our existing Class A, felt AB in his review. “Astonishing” ability to replicate transient attack is coupled with an almost unique ability to decode spatial cues within the recorded information, as well as Syngis low-frequency extension. However, it needs a tonearm with a secure mechanical foundation to achieve its best—the Wheaton Triplanar was a better match than the air-bearing Airtangent, for example. Stereo separation dependent on downforce, 3,5gm or more shifting the coils from their optimum position, effectively resulting in mono reproduction. (Vol.12 No.7)

Koetsu Rosewood Signature: $1950

The latest version of Martin Colloms’s reference pickup “matches the Troika for bass definition and overall definition.” It offers a superb balance between the ability to decode space and perspective and to present a detailed retrieval of groove information, and allowing the listener to be swept away by the music. (Vol. 13 No.3)

Linn Troika: $1750

Lightish balance, but musical integrity not compromised by superb retrieval of information. As good as the Koetsu Rosewood at presentation of the soundstage, in JAs opinion, with one of the best-defined bass registers in the business. Unique three-point fixing maximizes mechanical integrity but means that it can only be easily used in the Ittok and Ekos tonearms. (Vol.10 No.6, Vol.13 No.3)

Monster Cable Sigma Genesis 2000: $1200

Early samples seemed to be very arm-sensitive, but when mounted in an optimum tonearm—the ET Two, for example—the Sigma Genesis offers an airy and open sound with superb dynamics but a rather soft bass. Rather a forward if detailed presentation of soundstage information, as though the 2000 “seemed to turn up the contrast ratio a notch,” thought MC, implying that it would not be the best choice for systems that are already a little larger than life. (Vol.13 No.3)

Ortofon MC-3000 II: $1500

The “second most neutral cartridge” JGH knows of. This ceramic-bodied, higher-output child of the MC-2000 has a slightly warm balance, with silky highs producing a sumptuous sound from massed violins. Lateral imaging excellent but presentation of depth not as good, paradoxically; as the more forward MC-2000. Matching T-3000 transformer not in the same sonic class as, for example, the Vendetta Research phono preamplifier (which renders the transformer unnecessary). (Vol.11 Nos.1, 10, & 11)

Talisman Virtuoso DTI: $1200

Warmer balance than the Talisman S, with first-rate imaging and excellent harmonic contrast. One of the champs when it comes to retrieval of HF detail, with a top end free from the problems of fuzz and hash that plague many MCs. According to SWW, it has the “uncanny ability to reproduce the natural weight and authority of live music,” with DO concurring that spatial detail “is sketched out with exquisite dimensionality.” VH stylus requires careful setup; output a little on the low side for some MM inputs. Somewhat forward balance, but up with the best in terms of transparency. With the cartridge optimally set up, the music emerges from a near-silent background akin to CD. (Vol.9 No.4, Vol.10 No.5, Vol.12 No.4)

van den Hul MC One: $1125

Not particularly cable-fussy, but does require attention to arm damping. Works very well in the WTA and SME. Carries the vdH MC-I0’s resolution of soundstaging, tonal neutrality, and naturalness of midrange timbre a stage farther to compete with the best. Bass a little slow, perhaps, when compared with best performers in this region. (Vol.9 No.8, Vol.10 No.5, Vol.12 No.2)

B

AudioQuest 4041-L cartridge: $550

A slightly forward treble and a minor lack of image depth didn’t prevent TJJ from enthusiastically recommending this MC, the sound being naturally detailed without any HF exaggeration. Current production samples have “Functionally Perfect copper” coil windings, said to improve the sound of the low-output version slightly but that of the “H” high-output version to a significant extent. (Vol.12 No.3)

Signet AT-OC9: $400

“The best ever from Audio-Technica,” said TJJ of this MC, until early 1989 only available in the US as a “gray” import. Neutral through the midrange, the OC9 is less sweet and three-dimensional than the Class A vdH MC One, but not by much. Highly recommended (and an excellent tracker). A point worth noting is that it has very high output for a low-output ‘coil, minimizing phono-stage noise. (Vol.12 No.2)

Clearaudio Gamma: $495

A “cool and taut” balance with perhaps an overgenerous allowance of high frequencies didn’t prevent the Gamma from impressing TJJ, who noted its fine image focus and superb retrieval of detail. While its sonic resemblance the more expensive Krell KC-100 to an uncanny degree, the latter does sound a bit more “palpable.” The Nestorovic Moving-Coil Cartridge Network (see Vol.13 No.9) is recommended to tame the Gamma’s HF. (Vol.13 No.4)

Grado Signature TLZ: $500

The only MM model to break out from the confines of Class C, the TLZ features slightly more high opens than the AudioQuest 4041-L, an open, lively midrange, a taut midbass, and expansive low frequencies, according to TJN. (Vol.12 No.7)

Krell KC-100: $800

A wide, deep, and focused soundstage is coupled with liveliness and clarity. If a little bright, the KC-100 “exceeds in soundstaging and separation of individual details within the soundstage,” said TJJ. Borderline Class A. (Vol.12 No.2)

Stereophile, October 1990
Stereophile, October 1990

Linn Karma: $1225 ∗
Forward balance, with good, but not excellent, imaging. The whole is better than the sum of the parts, the result being consistently musical, particularly on rock and jazz material. (Vol.10 No.5)

Monster Alpha Genesis 1000 II: $800 ∗
Almost as sweet in the top five octaves as the Koetsu Red Signature but more detailed. For a long time one of Dick Olsher’s favorites, while DAS finds it “to play a wider variety of material with superb detail” than any cartridge he had heard up to February 1990. (Vol.10 No.5)

Talisman Virtuoso Boron vDH: $850
A neutral sound, coupled with good retrieval of inner detail and a smooth, well-controlled treble, thought DO of this high-output MC. Less good soundstaging than the more expensive DTI version, which offers a greater sense of depth, a more palpable image, and a less “exciting” sound. (Vol.12 No.4)

Vanden Hul MC-10: $825 ∗
The first vDH to provide midrange and bass extension to match the typically excellent vDH high-frequency extension and detail. Tonal balance more like CD than the Koetsus. Superb decoding of recorded detail, but requires careful setup. (Vol.9 No.6, Vol.10 No.5)

A&R P77Mg: $150 ∗
Polite, sweet sound and a neutral tonal balance, but this English MM from Audio Influx is a little undernourished, dynamically. Will work wonders in an otherwise briskly balanced system. (Vol.10 No.4)

AudioQuest Ruby: $200
High-output MC, available only from The Audio Advisor, offers excellent retrieval of detail without sounding too forward or bright. Mates well with the AudioQuest PT-5 tonearm. (Vol.12 No.8)

Audio-Technica AT-F5: $250
Somewhat laid-back, not at all forward or peaky, said the Skateboard of this gray-import MC, available from Music Hall and Lyle Cartridges. Add the fact that it “plays tunes” without being overly done in the bass, and you can see why ST prefers it to the Shure V15 V-MR. (Vol.11 No.7)

Denon DL-160: $115 ∗
KK felt the highs to be a little too soft, but deep, deep bass and wide, wide soundstaging gave this budget high-output MC a BIG sound. Sam Tellig was less impressed with the bass, but felt that its smooth, relaxed presentation of detail was most seductive. A winner in systems tending to be too upfront. (Vol.9 No.8, Vol.10 No.1)

Grado Signature MCZ: $300
Although basically similar to the more expensive TLZ, the MCZ is less “fast”-sounding, with less well-extended highs and a less-focused sound. A “steady shortstop” rather than a “home-run hitter,” said TJN. (Vol.12 No.7)

Linn K9: $275 ∗
Remarkably neutral, clean-sounding MM fitted with a good diamond, features good transient response and bass dynamics, though slight tendency to edginess and upfront balance will favor systems optimized for non-classical music reproduction. (Vol.10 No.1)

Nagaoka MP11 Boron: $150 ∗
Clear, precise midrange and treble are allied with rather veiled bass, but the mixture will work well in inexpensive systems where the need for unfatiguing highs outweighs the lack of low-frequency clarity. Less expensive MP11 Gold ($100, reviewed in Vol.10 No.4) almost as good. (Vol.10 No.2)

Ortofon MC-20 Super: $350 ∗
Wide but shallow soundstage and somewhat exaggerated high end will mean careful attention to system matching. Like the X5-MC, the MC-20 Super will do well in systems having a depressed top octave. (Vol.10 No.5)

Ortofon X5-MC: $300
This high-output MC features tight, extended low frequencies, and the Gyger-profile stylus retrieves more detail from the groove than the similar X3-MC. Somewhat forward-sounding, however. (Vol.11 No.7)

Shure V15 Type V-MR: $297 ∗
Very neutral midrange and bass, slightly soft high end, high compliance. You sacrifice a bit of detail but compared with good MCs and the more expensive ($400) Shure Ultra 500. A “budget reference,” according to Sam Tellig and Larry Greenhill, who, given their druthers, would place it in Class B. Recommended for its unsurpassed tracking ability, excellent reliability, and listenability. Excellent value, frequently available at significant discount. (Vol.7 Nos.5 & 8, Vol.10 No.5, Vol.12 No.11)

D
Goldring Epic II: $80 ∗
Good trackability, and more extended HF response than the Epic sold in the UK (but less good soundstaging), makes it suitable for use in relatively expensive LP players until the budget can be stretched for a Class B or C cartridge. (Vol.10 No.1)

Grado ZTE+1: $25 ∗
The best buy in a really cheap cartridge, this $25 MM has excellent trackability and sounds rather like a good MC. Readers of this magazine should consider spending more than $25 on a cartridge, but when they are asked by friends what they would recommend for an old Dual or Garrard, this “system saver” is the one to mention. Will hum if used with older AR decks; lack of suspension damping can lead to woofer pumping, even flutter, with high- or even medium-mass arms. (Vol.7 No.8; actual review was of an earlier version, the GTE+1)

Nagaoka MP10: $60 ∗
Rivals the cheap Grado as a bargain-hunter’s dream. Lacks attack and detail, but sounds well-integrated across the frequency band. (Vol.10 No.4)

Ortofon MC-10 Super: $120 ∗
“Uncolored, detailed, and composed,” said KK of this conventional-output MC, with a performance evenly balanced across the board. Sins of omission rather than commission lead to a recommendation. Reduction in price makes this Ortofon much more competitive—“A great deal,” says PWM. (Vol.10 No.2)

Shure VST III cartridge: $105
Sounding best when used with its integral damping brush, this inexpensive MM lacks transparency and detail, but tracks superbly and offers a neutral tonal balance. (Vol.12 No.3)
Deletions
van den Hul MC Two, Krell KC-200, Monster Cable
Alpha Genesis 500, Spectral MCR-1 all discontinued.

CD Players &
Digital Processors

Editor's Note: The class ratings are a little different for CD players: whereas the phrase "state of the art" can be interpreted literally for other categories, here it means the best CD sound available as of the time of writing. We urge caution to someone about to purchase an expensive "state-of-the-art" CD player, particularly with the rapid adoption of "Bitstream" technology, and note that perhaps the wisest strategy these days would be to buy separate transport and DAC units, eventual replacement of the latter being the best way to stay abreast of continuing development. However, it now seems that deficiencies in the A/D converters used to master CDs may well be the limiting factor in CD sound—see Robert Harley's interview with Doug Sax in Vol.12 No.10. It's also worth comparing the performance of the industry-standard Sony PCM-1630 ADC on the appropriate tracks on the Stereophile Test CD.

Esoteric P2 CD transport: $4000
Robert Harley, Arnis Balgalvis, and Peter Mitchell all swear by the improvement wrought on CD sound when this beautifully constructed but expensive transport is used. Astonishingly low measured jitter, found RH (see Vol.13 No.5, p.87), lower even than that intrinsically typical of a CD. Internal clamp renders it incompatible with CDs fitted with damping rings or the central retainer disc for the Mod Squad Damper, however (NR)

Esoteric D-2 D/A converter: $4000
(See RH's review in this issue)

Krell SBP-64X D/A processor: $8950
Not yet reviewed, but the finest sound from CD that Sam Tellig, the Audio Anarchist, has heard. Larry Greenhill also recommends this processor, though Martin Colloms points to excessive distortion at high frequencies and high recorded levels. Don Scott feels that the Krell processors work well with the inexpensive Luxman D113-D transport. (NR)

Stax DAC-Xit D/A converter: $12,000
A tube output stage, superb dual-aluminum construction, and expensive, hand-adjusted, 20-bit Ultra Analog DACs lead not only to the finest-measuring D/A processor Stereophile has encountered, but also to the best-sounding such unit, in the opinions of RH, LA, and JA. "It sounded more like analog than any other digital processor I've heard," said RH (and he's heard a lot). Perhaps lacks low-frequency impact compared with the Thetas and Wadias, but its fatigue-free sound easily becomes addictive. Note that its balanced outputs are polarity-inverting. (Vol.13 No.8)

Theta DS Pre Generation II D/A preamplifier: $4500
Providing extensive digital-domain functions, including a tape-monitor facility, this massive processor features user-replaceable ROM chips containing the coefficients for the digital filter. The analog section includes one additional set of line-level inputs. LL felt the sound to be the best he had ever heard from CD, with a vividly three-dimensional soundstage and superb transparency. DO found the best sound from the DS Pre is to be had from its Tape Out sockets. Less expensive DS Pro dispenses with the preamplifier functions. Preliminary auditioning of Generation II versions by AB, LL, and DO suggest that this performance has been taken one step further. (Vol.12 No.3, original version)

Theta DS Pro Basic D/A converter: $2000
RH felt the sound of the DS Pro Basic only to be outclassed by the $12,000 Sax. Its resolution of fine detail and soundstage depth was among the best he had heard: "vivid" was his word to describe its overall presentation. Nevertheless, he felt it lacked the ultimate sense of ease so typical of good analog replay. Maximum output level is 1dB higher than the industry standard 2V, which will optimize the Pro's use with passive control units. (Vol.13 No.8)

Wadia Digital WD2000 D/A decoding computer: $7995
This processor features a digital filter that differs from just about every other around in that it uses an algorithm different from the ubiquitous (sine) x impulse-response reconstruction filter, intended to more closely synthesize the original analog waveform before sampling. (See "Manufacturers' Comments" in Vol.13 No.8, p.191.) LG feels the Wadia 2000 to be better than the Krell, while AB thought it to be "a sonic knockout," particularly when fed a digital signal from the expensive Esoteric P2 transport. AB also enthused at length about the Wadia's ability to throw a deep, detailed, and stable soundstage. AB feels that the balanced outputs give the most musical sound. High frequencies are a little rolled-off in comparison with the other Class A contenders, which might mean more-than-usual care in system matching, while relatively high levels of ultrasonic and RF spurious present in the analog output might lead to trouble with some pre- and power amplifiers. As with the Theta and Krell processors, the Wadia's DSP program is held on replaceable ROM chips, allowing for relatively inexpensive performance upgrades. Recent controversy concerns whether the Wadia processor is 64x-oversampling or 16x-oversampling. (It appears that it is 16x-over- sampling in the digital domain, with a further 4x factor achieved by timesharing the signal between four separate Burr-Brown 18-bit DACs—Shades of Stan Curtis's original Cambridge CD1 of 1985!) The actual oversampling ratio, however, would appear to be less important than the musical results, and there the Wadia can hardly be faulted. Low-level linearity of the WD2000, surprisingly, was quite poor compared with the other Class A recommended units. (Vol.13 No.1)

Arcam Delta 70 CD transport: $1300
A high-quality CD transport using Philips's top mechanism with optical and coaxial serial digital outputs. (Vol.12 No.10)

Esoteric D-10 D/A converter: $2000
(See RH's review in this issue)

Kinergetics KCD-40: $1995
Quite the best single-box CD player JA heard until the Meridian 206 came along, the KCD-40 offers a rather
laid-back balance, but with a superbly detailed soundstage. Less soft-sounding than the Wadia, the KCD-40 lacks a little image depth in absolute terms, but not to the detriment of the music, which never fails to communicate. “Platinum” series cosmetics add $300 to price. (Vol.13 No.1)

Meridian 203 D/A converter: $990
Sam Tellig feels that this relatively inexpensive Bitstream processor is perhaps the best, in terms of being the most musical, he has heard; Martin Colloms is also mightily impressed. A full review is in progress. (Vol.13 Nos.9 & 10)

Meridian 206: $1650
The finest player, JA has auditioned that uses the standard 16-bit, 4x-oversampling Philips chip set. He feels the 206 rivals the Kinergetics KCD-40 in its ability to allow the listener to forget the hardware and concentrate on the music. Soundstage presentation is wide, deep, and palpable, tonalities are rendered accurately, and the treble is free from “digital hash.” JA found the 206 to slightly better the sound of the Proceed PDP; his only doubts concern the 206’s future given Meridian’s enthusiastic adoption of Philips’ Bitstream DAC technology in their 203 converter and 208 CD player/preamplifier. It should be noted, however, that the 206 would make a superb transport for driving the 203. (Vol.13 No.7)

Proceed PDP D/A converter: $1295
Although it has a similarly tight and punchy bass, similarly excellent dynamics, and similarly good soundstaging, the PDP has a musically much more involving sound than the Proceed PCD which uses the same digital electronics, RH found. Not the least, this is due to the processor having a less forward treble than the CD player, with a sense of ease and liquidity to its sound that slightly betters the excellent Aragon D2A in these areas. (Vol.13 No.6)

Wadia Digimaster X-32 D/A converter: $1995
Lows were almost as dynamic as the class A Wadia 2000, RH felt, but its soundstage wasn’t as deep as those of the big Wadia or the Theta DS Pro. The extreme treble sounds a little rolled-off—it measures that way, due to its non-(sine x)/x digital filter—but this is offset by a forward, almost bright presentation in the mid treble and a rather dark-sounding midrange. Nevertheless, the X-32’s sound is very musical, with excellent dynamics and a good presentation of transient detail. Coaxial digital inputs use BNC sockets. (Vol.13 No.8)

Aragon D2A D/A converter: $995
Borderline Class B sound from this inexpensive but well-constructed, Mike Moffat–designed processor when it is used with the optional $250 IPS power supply, RH feeling that when used on its own, the D2A lacked low-frequency definition and visceral impact, leading to rather a lean balance. Robert Deutsch also preferred the D2A’s sound with the IPS, in which case he feels it better than the Proceed PDP. Strengths include a relative freedom from high-frequency hardness and grain and an excellent presentation of musical detail. (Vol.13 No.6)

California Audio Labs Icon: $695
Rather than picking out aspects of the Icon’s sound that impressed him in his review, GL preferred to concentrate on the Icon’s ability to present music with an excellent across-the-board balance. When pressed, he pointed to the player’s natural presentation of instrumental tone and its lack of “hi-fi” glare. Digital output module costs an additional $95. (Vol.13 No.4)

Esoteric D-500 D/A converter: $1000
(See RH’s review in this issue)

JVC XLZ-1010TN: $700
An open, well-defined soundstage presentation, with a superb sense of space, and an excellent degree of transparency were among the strengths of this modestly priced but well-constructed player, thought both RH and GL. A rather forward upper treble makes the Class C recommendation rather borderline, however, and will also make system matching a little difficult. (Vol.13 No.4)

Proceed PCD: $1650
This unusually styled, superbly constructed player has a more lively, upfront balance than the Kinergetics KCD-40, with strong, powerful bass, a rather laid-back spatial presentation, and a “liquid midrange texture,” according to Robert Harley. Important to allow a good warm-up period before listening to this player, as it initially sounds rather aggressive and thin. (Vol.13 No.2)

Rotel RCD-855: $399
This inexpensive player—based on Philips’s 16-bit, 4x-oversampling chip set and CD4 transport—so impressed LH that he recommended it to 20 other fellow members of the National Symphony Orchestra. “Great sound for a peanuts price,” was the thrust of the conclusion to his review. Very sensitive to the cables with which it is used, though in the right context LH feels the $855 offers “a degree of transparency and harmonic neutrality usually found only with the expensive stuff.” Fitted with a digital output. A provisional Class C rating pending “Follow-Up” auditioning in Santa Fe. (Vol.13 No.7)

D

Adcom GCD-575 CD player: $600
This relatively modestly priced player offers superb resolution of detail. Dynamics a little restricted, however, and balance may be too lean for some tastes, though LH feels its midbass to be a little too full. (Vol.12 Nos.3 & 6)

Arcam Delta Black Box: $650/$799
Outboard digital processor that uses a selected Philips 4x-oversampling, 16-bit chip set and a custom LSI to look after the digital signal handling. Tonal quality a little forward in the midrange, with slightly “tizzy” highs, and upper bass rather soft; nevertheless, a very musical sound. The optical-input version costs another $149. (Vol.12 Nos.2 & 10)

Harman/Kardon HD7500 II: $529
JAs and GLs auditioning convinced them that this inexpensive “bitstream” player deserves a Class D recommendation, but see RH’s review for a contrary opinion. The debate essentially concerns whether the 7500’s glare in the treble is acceptable within the context of a Class D recommendation or not. All agree, however, on the quality of this player’s low-frequency weight and impact. Overall presentation is somewhat forward in the midrange. More expensive HD7600 identical apart from digital output and more varied features. Sample reviewed was the Mk.I; Mk.II incorporates rear-
panel remote jack, improved transport, more chassis damping. (Vol.13 No.4)

**Sansui AU-X911DG D/A amplifier: $1100**

Very expensive for Class D, but LG feels its excellent-sounding MASH D/A section to be justification for recommending this full-featured integrated amplifier. RH demurs, so careful reading of the reviews is essential before making a final purchasing decision. (Vol.12 No.11, Vol.13 Nos.3 & 7)

K

The Mod Squad Prism, CAL Tercet Mk.III and Aria Mk.III, Krell MD-1 CD turntable and SBP-32X, Meridian 208, NAD 5000, Wadia X64.4.

**Deletions**

Accuphase DP-80L/DC-81L, Sony CDP-RI/DAS-RI, Philips LH11000, Barclay Bordeaux, Precision Audio DIVC-80, and Sonographe SDI Beta all not auditioned in too long a time, considering the rapid pace of digital development; Rotel RCD 820BX2 not as good-sounding as less expensive RCD-855; Krell SBP-16X D/A processor replaced by ±2x-oversampling version and Wadia Digital WD1000 D/A decoding computer replaced by less expensive X64.4; neither of which have been auditioned.

**Preamplifiers**

**A**

**Mark Levinson No.26: $5035**

The No.26 has a more laid-back presentation of the music than the Krell preamps, coupled with superb definition of detail and soundstage delineation. One of the two finest solid-state preamps JA has heard, the other being the Vendetta phono unit. With internal switches set for minimum gain, the sound lacks dynamics, however. Has both balanced and unbalanced outputs, a choice of internal balanced line-level input or high- or low-gain phono input, and front-panel switchable signal polarity. The price quoted is for the version with the balanced input module. Digibuffs can obtain a basic version without phono stage. Should they change their minds, an outboard phono unit, the No.25, is available. (Vol.11 No.5)

**Mark Levinson No.25: $1990/$1910**

**High/Low Gain**

**$2990/$2910 with PLS-226 power supply**

MC-line-level phono preamplifier featuring circuitry identical to the phono section of the No.26 and conventional unbalanced outputs, the No.25 can be powered from the No.26's PLS-226 supply or from its own, with which it achieves a stunning degree of transparency, neutrality, and musicality. JA has obtained the best results from the No.25 with the latest AudioQuest Lapis connecting it to the No.26; Madrigal's own HPC interconnect renders the sound more forward, even more vivid, but this will make the sound rather unforgiving unless the system is rather laid-back overall. Needs careful positioning to avoid hum being induced into its circuitry from the power supplies of other components. (NR, but see the No.26 review in Vol.11 No.5)

**Threshold FET 10: $4150**

Two-box solid-state preamplifier—phono ($1650) and line stages ($2500) available separately—with separate 'e' series power supplies. Not quite as rich-sounding as the Audio Research SP11, according to JGH, and not quite as much image depth, but accurate, transparent, and capable of intensely musical sound. Borderline Class A sound with its basic power supply (with which the combined price drops to $3550; ie, $1350 phono/$2200 line stage), but true Class A with its upgraded, beefier supply. Threshold having taken the hint from the fact that a number of FET-10 owners—including JGH—had bought the John Curl–designed Vendetta Research power supply. Owners of the original power-supply version can have their preamps upgraded by any authorized Threshold dealer. (Vol.10 No.6, Vol.11 No.1)

**Vendetta Research SCP-2B phono-preamp: $2495**

A dual-mono MC-line-level RIAA equalizer and preamplifier from John Curl that redefines the definition of 'quiet.' JGH felt that this well-made unit imposed less of a signature on the signal than any other preamp he has heard. An ideal partner for a passive-preamp-based system, though its lowish output means that the power amplifier or speakers used must be quite sensitive if musically acceptable levels are to be achieved. Current version is non-polarity-inverting. (Vol.11 No.6)

**B**

**Adcom GFP-565: $800**

An excellent preamp with superb parts quality, buffered tape outputs, low output impedance, and high-current, low-impedance power supply, that incorporates Walt Jung's designs. GAG feels the '565 should convince even the most skeptical listener that IC op-amp circuits can sound both musical and accurate. Fully featured, but purist outputs are supplied that bypass tone control and filter switching. MM phono preamp is one of the quietest ever, with accurate RIAA EQ. The best under-$1000 preamplifier, according to GAG, offering stiff competition to far more costly units. GAG felt Class B was the most suitable rating for the '565, this confirmed by further auditioning in Santa Fe—see the "Follow-Up" review in this issue. (Vol.13 Nos.2 & 10)

**Audio Research SP14: $2995**

Borderline Class A sound for this versatile hybrid tube/FET preamp. The SP14 is one of those rare components that lays every sonic detail clear without destroying the essential sense of musical wholeness. It allows the listener to hear into the soundstage in an addictive manner, without having individual instruments thrust forward at him or her, though that soundstage is a little less wide than with the best preamps. The quality of its line stage matches that of the phono, GL enthusing that at last he "could hear through the electronics to the music itself." JA feels the SP14's treble is perhaps a little more etched-sounding via its phono stage than, say, that of the Conrad-Johnson PV9, but both, as GL noted, share a similar quality—"magic." (Vol.13 No.6)

**Conrad-Johnson PV9: $2950**

Single-chassis derivative of the Premier Seven, this all-tube preamp shares many of that thoroughbred's operating idiosyncrasies, including the excessive line-stage gain and the kamikaze tape-monitor switching. But for those with Grados or Talisman high-output MCs, the sound from LP, if rather laid-back for some tastes or some systems, will approach Class A quality. GL felt
that its phono stage's ability to retrieve the finest detail in complex passages was uncanny—the PV9 "is made to reproduce saxophone, string bass, male and female voice." The line stage is less neutral, and is also polarity-inverting. (Vol.12 No.5, see also GL's SPI4 review in Vol.13 No.6)

David Berning TF-12: $2950

"Incredible liquidity" and "an impressively wide, spacious soundstage," said JGH, but ultimately he found the TF-12's phono stage to be too mellow, feeling that it erred from neutrality in the opposite direction from the Klyne SK-5A by about the same amount. JA feels, however, that this tube preamp's unique combination of musicality and remote control of volume and balance deserve a guarded recommendation, particularly in systems verging on too bright a presentation. (Vol.11 No.7)

Electrocompaniet EC-1: $2095

A clean and detailed sound, especially at low frequencies, with realistic dynamics. Balance a little on the warm side. "Excellent value for money," and "An outstanding recommendation," proclaimed SWW, if not quite reaching the standard set by the more-expensive Klyne. EC-IA ($1795) is identical to the EC-1, apart from lacking the MC-2 MC board, and will accept MM and high-output MC cartridges, as well as low-output MCs down to 0.3mV output. (Vol.10 No.9)

Klyne SK-5A: $3250

Incredibly clean, quick, detailed, smooth, open, and solid, with superb imaging and soundstaging. One of the most neutral preamplifiers, but a lack of sympathy for systems having a forward balance precludes a Class A rating. TJN's long-term reference. Particularly suitable for moving-coils (includes a variable-gain head amp and HF rolloff switching). (Vol.10 No.6)

Krell KSP-7B: $2700

According to the Audio Anarchist, you used to have to pay $4-5k for a preamp this good. "Neutral, sweet, and above all dynamic," he says. AB feels that high Class B is the KSP-7B's natural home. (NR)

Meitner PA6i: $2395

Fully remote-control solid-state preamplifier that scores in low-frequency extension and soundstage presentation. Absolute polarity switchable from the listening seat. Somewhat bright balance—" zest and sparkle," noted AB in his review—but a relative lack of detail and dynamics precludes a Class A rating. Best used with the Meitner "Translink" line-level isolating transformers. Price includes wired remote and phono module; $2495 with IR remote and phono module. (Vol.12 No.6)

The Mod Squad Phono Drive: $1495

Beautifully engineered, stand-alone MC/MM phono stage with line-level output. Includes low-output impedance line stage with volume and balance controls. Excellent delineation of detail; superb soundstaging; only a rather high noise level with moderate-output MCs precludes a Class A recommendation. Also now sold in conjunction with the Mod Squad's Line Drive Deluxe as the Duet. EPS version with external power supply costs $1795. Owners of Phono Drives manufactured before 1990 can have them updated by the factory to current specification for $250. A "Follow-Up" review of the latest version is underway. (Vol.12 No.1)

Music Reference RM5 Mk.II: $1150

Tube design unique in offering user-adjustable line-stage negative feedback. DO found the preamp to sing with overall feedback set to give 18dB of gain; with the RM5 set to this condition he felt there were no sonic weaknesses, apart from a slight lack of dynamics. Otherwise, soundstaging was excellent, the treble free from grain, the lows tight and extended. Best suited for a good MM or a high-output MC, the RM5 represents superb value at an affordable price. (Vol.13 No.4)

C

Audio by Van Alstine Super-PAS Three: $595

Owners of vintage Dynaco PAS2, -3, and -3X tube preamplifiers can send them to Frank Van Alstine to be modified for $350, or can rebuild them themselves with a $200 AWA parts kit; otherwise, AVA offers Super-PAS preamps constructed on new Dynaco chassis for $595. Featuring rather a lean tonal balance with less well-defined low frequencies than should otherwise be the case, the Super-PAS Three has excellent soundstaging and is still the least expensive way for an audiophile who prefers to use MM cartridges to acquire Class C preamp sound. Limited LF headroom on phono input mandates careful matching of cartridge and tonearm. Now uses gold-plated Tiffany connectors and Chinese 12AX7A tubes with 25% higher gain. (Vol.11 Nos.10 & 12)

Forté 2: $990

Basic preamp from Threshold's Nelson Pass, using premium ICs, that accommodates all but the lowest-output MCs—gain and loading all being adjustable internally. "No significant shortcomings apart from dynamics," said the Audio Anarchist, while the line stage, if not as neutral as the best Class B and A models, renders the sound of CDs a little on the mellow side—not a bad thing. (Vol.12 No.5)

Hafler Iris: $900

Ingenious, all-FET remote-control preamp designed by Acoustan's Jim Strickland, with analog volume and balance controls. Line stage a little on the dry, wispy side, with slightly restricted soundstaging, but fundamentally neutral tonal balance. Low-noise phono stage (MM and MC) is lightish-balanced, resulting in a sound that overall doesn't quite approach the PS 4.6/M-500 combination, although more musical than the Class D contenders. DAS disagrees, feeling the Iris to belong in Class B. Version without the remote control and IR receiver card is available for $650. (Vol.12 No.6)

Linn LK1: $1050

Unusual but exquisitely made solid-state preamp with digitally switched volume control and all-XLR input/output sockets apart from phono (MC and MM). (Linn dealers can supply suitable adapter cables.) Line stage is polarity-inverting. Only four line-level inputs may be a drawback. Fundamentally on a par with the PS Audio 4.6 sonically, with a similar slight veiled over the sound (though less bright overall), the LKI is far more civilized. At its best with the matching LK280 power amplifier, when it provides "fit-and-forget" high-quality sound, particularly from LP. Owners of high-output MMs should note that the MM input has limited headroom, particularly at high frequencies. Remote control—essential—adds $110 to price. (Vol.12 No.7)
MFA Magus: $995

"A fine preamplifier for under $1000," said Sam Telig of the Magus, which features "the magic of tubes in the midrange... sweet, smooth, and easy on the ear," without the sound becoming too dark or closed-in, or the bass too flabby. Idiosyncratic gain setting, which means that the line section will be too sensitive when the phone input is optimized for low-output MCs, but a mono switch is included. (Vol.12 No.12)

NAD 1300: $399

Full-function preamp with versatile tone controls. Superbly quiet, delicate-sounding MC input; excellent dynamics, extended highs; slightly forward tonal balance better suited to rock or jazz than to classical music. Rather lightweight bass makes the 1300 an unsuitable match with the NAD power amplifiers, which are also a little lightweight. (Vol.11 No.12)

PS Audio 4.6: $699

Excellent phono stage (switchable between MM and MC), if both a little bright and lacking air when compared with the Class B contenders. Line-section is sweet, though a little wispy in the highs, rather than punchy and dynamic, but can be switched out. TJN suggests that the overall performance is of almost Class B standard when the 4.6 is coupled with the M500 power supply (which raises the price to $1094). (Vol.11 Nos.9 & 12)

PSE Studio SL: $750

Inexpensive solid-state preamp with balanced and unbalanced outputs that sounds its best after 72 hours' warmup. Includes a mono switch! Good transparency, dynamics, and rendition of instrumental tonality, but the PSE can sound rather cold with some power amplifiers. MM input has limited headroom, so high-output types best avoided. (Vol.15 No.1)

Superphon CD Maxx line preamp: $399

Inexpensive, line-level-only active preamplifier with unique styling and extremely neutral sound. (Vol.11 No.9)

D

Adcom GTP-400: $380

GAG enthused at length in his review over this inexpensive IC-based tuner/preamplifier combination that has had op-amp guru Walt Jung's magic wand waved over it. Very low noise on all inputs; euphonically warm-sounding rather than accurate phono circuit; reasonable soundstage depth; line stage rather laid-back in the top; not the ultimate in inner detail; the overall sound, however, is musical and enjoyable. Errors are of omission rather than addition. Tuner section, although not offering the ultimate in selectivity, will be good enough for most users and, again, offers musically satisfying sound. (Vol.12 No.9)

Parasound P/FET-900: $395

Neutral line section with good dynamics; MM-only phono stage has slightly astringent treble. (Vol.11 No.12)

K

Audio Research SLI, Jeff Rowland Consonance, Classé DR-5 and DR-6, Counterpoint SA-9/SA-11 and SA-5000, Quicksilver, Convergent Audio Technology SLI, Coda.

Deletions

Conrad-Johnson Premier Seven replaced by Mk.II, not yet auditioned; US distribution of Canadian Dolan PM-1 uncertain.

Passive Control Units

A

Electronic Visionary Systems Attenuators: $150–$600

RH enthused over the transparency offered by these passive control units, sold by mail-order only. Ranging from the dual mono, $150/pair ($165/pair wired with OFC) Ultimate Attenuators, which plug into the power amplifier's input sockets, to the more convenient stereo Stepped Attenuator ($465) and Penny & Giles Attenuator ($445), those primarily interested in CD replay should investigate these well-made units. (Vol.13 No.7)

The Mod Squad Deluxe Line Drive AGT: $1095

Its passive nature places demands on upstream components to be able to drive a fairly demanding load, but if that's the case, the Line Drive Deluxe offers the most transparent, least colored way of achieving Class A sound from CD and other line-level sources. Must be used with short interconnects, however. (The improvement offered by the Deluxe over the conventional Line Drive is not subtle.) Sets a new standard for Class A sound at an unreasonably low cost, as well as offering considerably more versatility than the bare-bones EVS units mentioned above. JA's reference for (lack of) preamplifier sound. (Vol.12 No.1)

C

The Mod Squad Line Drive AGT: $595

The ideal Class C "preamplifier" for a CD-based system, given that its passive nature will mean that cables must be kept relatively short. Latest version has AGT (Advanced Grounding Topology) feature. (Vol.10 No.3)

D

QED PCC passive preamplifier: $250

Unusually styled but well-made passive control center, lacking transparency and dynamics when compared with active preamps. (Vol.11 No.12)

Moving-Coll Step-up Devices

A

Mark Levinson No.25: $2990/$2910

(High/Low Gain)

MC–line-level phono preamplifier featuring identical circuitry to the phono section of the No.26. Above price includes PLS-226 power supply. See "Preamplifiers." (NR)

Vendetta Research SCP-2B: $2495

Ultra-quiet dual mono phono preamplifier includes RIAA equalizer to give line-level output. See "Preamplifiers." (Vol.11 No.6)

B

Conrad-Johnson Premier Six: $985

Possessing colorations and transparency similar to those of the Premier Three, the Six can be ideal for use with transistor preamps, but requires careful matching. (Vol.8 No.5)

Counterpoint SA-2: $1095

Superb preservation of detail, low distortion, lovely..."
midrange. The noise is noticeably higher than that of the Klyne (see below), but the problem with fat bass on early units has been corrected. Coming with an interesting tube-bias adjustment for tailoring the sound to your tastes; the SA-2 can be made to sound rich and euphonic or somewhat lean—as long as you don’t go crazy wondering what’s right. (Vol.6 Nos.2 & 3)

Electrocompaniet MC-2: $450 •
Deleted from “Recommended Components” in 1986 due to lack of availability in the US, this solid-state head amp is now distributed by Music & Sound Imports. In the original review, AHC felt it to be better than the Klyne in terms of openness and dynamics, though less universally applicable. Must be used with cartridges having less than 50 ohms source impedance, so essential to audition with your chosen cartridge before purchase. (Vol.8 No.5)

Klyne SK-2a: $750 •
A close rival to the Counterpoint SA-2, the basic difference here being solid-state vs tubes. Superb bass, very deep and tight, excellent high-frequency extension, excellent imaging. It still lacks the three-dimensionality of tubes, but only slightly. Adjustable high-frequency rolloff and cartridge loading are boons for those with several MC cartridges. A bargain at $750. (Vol.7 No.3, Vol.8 No.5)

The Mod Squad Phono Drive: $1495
Matches both MM and MC cartridges with versatile loading options. Line-level output. See “Preamplifiers.” (Vol.11 No.1)

C

Music Reference RM-4C: $750 •
Not as good as the best tube step-ups, but similar in character and less expensive. The RM-4 is flexible and a good deal. (Vol.8 No.5)

Power Amplifiers

Editor’s Note: Class A amplifiers differ sufficiently in character that each will shine in an appropriate system. Careful auditioning with the user’s own loudspeakers is therefore essential.

Air Tight ATM-2: $5950
A classic stereo tube design from Japan that eschews the use of printed circuit boards in favor of point-to-point wiring. Dick Olsher’s reference for midrange accuracy: “the most refined tube amplifier money can buy.” Though its highs are free from grain or hash, the Air Tight does have rather a shut-in high treble when compared, for example, with the Audio Research Classic 60. Its low bass, too, is less well-defined than the other Class A amplifiers and it really needs to be used with speakers having 8 ohm impedances. Nevertheless, in an appropriate system—DO thought the combination of the ATM-2 with the Ensemble Reference minimonitors was particularly synergistic—the Air Tight will give superbly musical results. (Vol.13 No.5)

Audio Research Classic 60: $3295
The sound of this relatively low-powered stereo design that combines tubes with FETs is a little forward in the treble, yet never fails to sound musical, thought JA. Superbly delineated soundstaging. The midrange is presented with a natural tonality, and though the low frequencies are not as tight or as extended as the Krell or Mark Levinson competition, they have a musically appropriate fullness. (Vol.13 No.9)

Krell KSA-250: $5700
Preliminary auditioning by LL, LA, and JA indicate that this powerhouse of a stereo amplifier is perhaps the best Krell yet. Certainly it is superior to the superseded KSA-200. Review to appear shortly. (NR)

Mark Levinson No.20.5: $12,000/pair
Class-A 100W monoblock with fully regulated power supply for output stages. Successor to the legendary ML-2, the slightly different No.20 was the finest power amplifier JA has used, particularly regarding soundstaging and the authority of low frequencies. The No.20 had a somewhat soft treble balance compared with the No.23 and ARC M-300, but got the best from loudspeakers with which it was used, particularly regarding low-frequency extension and definition. Auditioning of the No.20.5, which differs from its predecessor only in the AP-4 Input and driver card—an upgrade costs $1000/pair—indicates that the performance of its predecessor has been improved upon, particularly with respect to the soft treble balance, though the amplifier’s basic “forgiving” nature, once warmed up, remains. Fully warmed up, the treble can be somewhat grainy. Offers both balanced and unbalanced inputs. (Vol.12 No.9)

Mark Levinson No.23: $5295
Notably less laid-back than the No.20.5 (or Krells), careful system matching is more necessary with this 200Wpc powerhouse of an amplifier. The result, however, is a sound that is harmonically correct, focused, and possessing great dynamic contrast, though with a bass that, though extended, is not quite as tight as the Krells’ (or No.20.5), according to LL (and JA). “Amazingly lifelike soundstage dimensionality” (!), concluded LL. (Vol.11 No.9)

Mark Levinson No.27: $3795
Borderline Class A compared with the Mark Levinson No.23 and No.20.5, due to an overall less transparent, less sweet sound, the 100Wpc No.27 nevertheless offers what LG felt to be typical M-L smoothness through the audible spectrum without the No.20.5’s softening of the highs. In fact, he found its speed, dynamics, and vividity to resemble the No.23, concluding that it was his “first choice in its price range.” (Vol.13 Nos.6 & 7)

Prodigy 150 monoblock OTL: $7000/pair
Monstrous OTL tube amp, developed from the Futerman designs once sold by NYAL. Tonal balance very dependent on load impedance presented by loudspeaker. Bass a little lightweight, despite well-extended small-signal LF response, and the sound can take on treble striidency with highly capacitive loads, but the Prodigy’s main strength is the depth and width of the soundstage thrown by a pair with appropriate speakers. (Vol.12 No.9)

Vacuum Tube Logic 225W DeLuxe monoblock: $4200/pair
Of these classic tube designs, Robert Harley commented that they are “easily the most musical and enjoyable amplifiers” he has heard. A wealth of detail is presented in a natural manner without the listener feeling that he should run for cover, while the soundstage has a transparent, see-through quality. Low fre-
Vacuum Tube Logic 300W Deluxe Monoblock: $4900/pair

"HF magic," said JGH in his review, commenting on this high-powered tube amp's ease in the treble, an attribute that is not obtained by dulling the music's HF content. This is coupled with well-defined low frequencies and a neutral midrange that makes wats well both with JGH's Sound-Lab electronics and with Infinity IRS Betas. (Gordon is currently auditioning the Manley 350, an amplifier that could well take the Deluxe 300's virtues even further in the same direction.) (Vol.11 No.10)

B

Aragon 4004: $1595

Attractively styled class-AB solid-state amp, designed by Krell's Dan D'Agostino, and capable of high current delivery into awkward speaker loads. Fuller sound than the original Adcom 555 ("being less dry in the top octaves," said TJN), more neutral tonal balance than the Motif MS-100, and even better soundstaging than the Onkyo M-50B, make it a borderline Class B contender. Good value for money; very high power rating—200Wpc—and an excellent reputation for reliability, according to LL. (Vol.10 No.9)

Boulder 500: $3699 ♠

Dropped from "Recommended Components" in 1988 due to a misunderstanding over its availability, this powerful solid-state amplifier, based on the late Deane Jensen's 990 discrete op-amp module, extends the traditional strengths of solid-state amplifiers throughout the frequency spectrum. Transparent sound and tonally very neutral, though with possibly a trace of hardiness in the mids, possibly rediscovered by recent, unauditioned circuit refinements. JGH thought the sound of Sound-Lab A3s driven by the less-featured but otherwise identical Boulder 500AE was a highlight of the 1990 WCES. (Vol.9 No.5)

Classé DR-3B: $3995 ♠

Now in a "B" revision, low 25Wpc and class-A operation remind one of the classic Mark Levinson ML-2. Mellower and richer than the Krells, and lacking their dynamics, the Classé DR-3 produces a sweet, detailed sound, with surprising output capability for the modest power rating. High Class B. Particularly well suited to Apogee Scintillas. (Vol.8 No.8)

Classé DR-9: $3495

First class-AB design from this Canadian manufacturer; the DR-9 gives up little to the DR-3 and scores highly in its ability to deliver high power into low-impedance loads. "Its strong suits are definition, detail, depth, and dynamics," said AB, to which must be added transparency and an extended spectral response. Less robust in the lows and leaner than the Krell KSA-200, the DR-9 excels at the reproduction of a convincingly real soundstage. Now features balanced and regular operation. (Vol.11 No.10)

Kebischull 35/70: $2595/pair

West German, low-powered tube monoblock that DO preferred to the Quicksilvers, Klimo Kents, and VTL stereo 75/75 when driving both old and new Quads. Plenty of midrange detail "but not at the expense of textural liquidity," timbral accuracy, and excellent soundstaging with a "feeling of precision and solidity about image outlines and timbres." The Anarchist feels that DO correctly described the Kebischull's strengths, but points out that its low power and limited ability to drive some awkward loudspeaker loads to any respectable level will make system matching very critical. (Vol.12 Nos.6 & 10)

Meitner MTR-101: $3400/pair

Beautifully styled all-FET monoblock with "Floating Charge Current" power supply. Excellent dynamic contrasts, well-controlled, tight low frequencies, if ultimately, not quite the overall authority of a Class A design. Would appear to give its best in an all-Meitner system. AB reports that current production is better than the vintage reviewed. (Vol.11 No.6)

Muse Model One Hundred Fifty: $2280/pair

Powerful and well-constructed MOSFET design from a pro-sound company that sounds on the upfront side of neutrality without losing the ability to present a recording's musical values intact. "Tight, well-controlled bass and a very natural, liquid midrange," said Robert Harley. (Vol.13 No.1)

Music Reference RM-9: $2450

The price quoted refers to the version outfitted with EL34 output tubes; KT88s add $300 to the price but improve the performance significantly, thought DO of this stereo Roger Modjeski design. With less of a sonic signature than the KT88-equipped Quicksilver, the RM-9 "does very little to interfere with the essence of the music," and the adjustable gain/feedback feature means that the amplifier can, to an extent, be "tuned" for a particular loudspeaker. (Vol.12 No.12)

Quicksilver: $1850/pair ♠

KT88 output tubes eliminate a residue of glare in the upper mids, giving more of a "see-through" quality. The Audio Anarchist found the mono Quicksilvers to be ideal with the Quad ESL-63s. Others have found them to work beautifully in a lot of low-power situations: reports from the field suggest that the Quicksilver is a happy choice for driving Vandersteen 2Cs as well as Acoustabs of various vintages. Wonderfully tube-like, superb, tonal-standards—setting midrange; can drive low impedances due to an excellent output transformer; but low frequencies still rather soft and ill-defined in the classic tube amplifier tradition. Stereophile's reviewers are divided on the Quicksilver's merits. LA feels that, despite the Quicksilver offering an overall "pleasant" sound, it is still a "low-resolution" design. "It just doesn't cut it in the bass," says DO, "and the amp is soft and muted on top." DO concluded his review by pointing out that the Quicksilver has too much of an old-fashioned sound for a Class B recommendation in these days of highly neutral amplifiers. GL, however, disagrees strongly with both LA and DO in his "Follow-Up," feeling that the Quicksilvers should remain in Class B on musical grounds: "It doesn't do anything to actively interfere with the music." Extraordinary long-term reliability for a tube design, Mr. Tellig parenthetically points out. (Vol.7 No.3, Vol.8 Nos.2 & 4, Vol.12 No.11, Vol.13 No.5)

Vacuum Tube Logic 100W Compact Monoblock: $2650/pair

A rather forward midrange is allied with excellent bass control for a tube design, and clean highs. Dynamics a little more limited than the 100W rating would imply.
Conservative operating conditions for its four EL34s should endow this VTL monoblock with long tube life. (Vol.11 No.11)

**Vacuum Tube Logic Stereo 90/90 Deluxe:** $1950

A slight midrange bloom and fullness reduce the clarity of its imaging, thought TJN of this tubed design, and push images forward a little too often. Nevertheless, despite a slightly soft high treble, this relatively modestly priced amplifier offers good bass extension and control and proved capable of generating an extremely musical sound, particularly with Vandersteen 2CIs. (Vol.15 No.5)

**C**

Adcom GFA-555 II: $800 ☆

See the “Follow-Up” review in this issue. (Vol.8 No.4, Vol.12 No.12, original version)

Bedini 150/150 Mk.II: $1000

An early rewrite of this solid-state amp failed to impress, but the Mk.II revision proved an exceptional performer with dynamic loudspeakers, matching the low-frequency performance of the no-longer-recommended Eagle 2A with a considerably greater degree of transparency and neutrality. Tonality is somewhat “dark-sounding,” according to DO. (Vol.11 No.2)

**Classic Audio CA 260:** $1299

Available exclusively by mail order, this beautifully constructed, dual-mono, FET-driver/tube-output, limited-edition hybrid was designed by George Kaye, once of NYAL, and features genuine McIntosh output transformers. Somewhat dark in sound, but “within the context of…Class C. I can’t think of a more musical performer,” said DO. (Vol.12 No.5)

**Discrete Technology LS2A:** $1250 ☆

More musically natural than the earlier version of PS Audio 200, and a warmer balance than the Adcom GFA-555, the solid-state Distech is less powerful than either. A touch of highest-end sound with a taste of tube quality for $1250. Latest “A” version has upgraded components and can be identified by new faceplate. (Vol.10 No.2)

**Forté Model 1a:** $1100

The original Model 1 was too dark-toned to merit recommendation, but the “la” revision is dramatically more open-sounding. Class-A operation means that it runs hot. A considerable break-in period aside, the la offers a natural tonality, detail without exaggeration, bass drive without boominess, and only gives up a little precision, midrange liquidity, and bass impact to the Class B competition. Soundstaging, in particular, is wide, deep, and accurate. A best buy, even despite a recent increase in price. (Vol.12 Nos.8 & 12)

**Hafler XL-280:** $725 ☆

Though JGH doesn’t agree with the claimed neutrality of this solid-state model, finding it a little dry and not quite as sweet in the treble as he would like, he still felt that it had “as nice a high end as any solid-state power amplifier in its power class.” Excellent performance for a modest price. (Vol.10 No.1, Vol.11 No.7)

**Kinergetics KBA-75:** $1495

Powerful, silent-running, fan-cooled, class-A design that, with the exception of a slightly dry upper midrange, has very little editorial effect on the music, in particular lacking any high-frequency glare. Doesn’t appear to be cramped by any particular loudspeaker, handling dynamics, electrostatics, and hybrids with aplomb. Restricted soundstage depth keeps this relatively modestly-priced amplifier from attaining a Class B recommendation. “Platinum” cosmetics add $300 to price. (Vol.13 No.1)

**Linn LK280:** $1495

Representing a considerable improvement over its predecessor, the LK2, this hot-running, almost dual-mono power amplifier (only the power transformer is shared between channels) is unusual in having fully regulated power supplies for the output stages. It offers an authoritative sound, with a more neutral treble than, for example, the Adcom GFA-555, but can really only be recommended for use with the LK1 preamplifier, due to its very low input impedance (3k ohms) and idiosyncratically wired XLR input connectors. An optional dedicated separate power supply, the $1195 “Spark,” was launched in June 1990. (Vol.12 No.7)

**NAD 2600A:** $799 ☆

Lively, upfront sound, possessing excellent impact and solidity, with “beefy” low frequencies. High frequencies dry, but good value for money considering the high (150Wpc) power and excellent dynamic headroom available. A “clean” sound, according to DAS, who also felt it not to have as much impact as JGH suggested it should. (Vol.10 No.2, Vol.11 No.8)

**PS Audio 100 Delta:** $1195

Actual version reviewed was the 100C, the Delta being cosmetically different. GL felt the PS 100C to be able to handle any kind of loudspeaker load with ease: “bass was full, tight, and extended…treble was pristine,” he wrote, after auditioning the amp with Spica TC-50s. The Audio Anarchist got less satisfying results with the PS Audio driving Martin-Logan Seagull IIIs, the sound becoming rather brittle, which suggests that the 100C should be auditioned with the speakers with which it is to be used. (Vol.12 Nos.9 & 12)

**PSE Studio IV:** $850

A lot of watts for the money from this modest-looking solid-state amp, coupled with a detailed, dynamic, neutral, yet never over-aggressive sound. “Small in size, but big in sound,” enthusiastically wrote GL in his review, commenting on the PSE’s ability to present the power of bass instruments without blurring the leading edges of their sounds. (Vol.13 No.1)

**C (Integrated Amplifiers)**

**Naim NAIT 2:** $825

Somewhat expensive, almost totally lacking in features, and very low-powered (21Wpc), the diminutive NAIT 2 would appear to be poor value for money. But when you listen to it, it offers much better sound than the Class D integrated amplifiers, featuring an expansive soundstage with a smooth, natural tonal balance and a liquid midrange. Lacks bass authority, however, low frequencies being neither extended nor tight, and the line stage is somewhat rolled-off in the highs. (A slightly tilted-up treble in the RIAA response ensures that LP reproduction is more neutrally balanced.) Best suited for sensitive monitors like the Celestion 3 and Monitor Audio Monitor 7. Sam Tellig thinks the NAIT 2 is “the best integrated amplifier he has heard.” (Vol.8 No.5 original version, Vol.12 No.9, Vol.13 No.4)

**Sansui AU-X911DG D/A amplifier:** $1100

Full-featured integrated amplifier with what LG feels...
to be an excellent-sounding MASH D/A section. RH demurs, so careful reading of the reviews is essential before making a final purchasing decision. (Vol.12 No.11, Vol.13 No.3 & 7)

D (Separates)
Adcom GFA-535: $330
"Extraordinarily clean, detailed, and musical. . . Far more detailed than I would ever imagine a $300 amplifier could be," said Sam Tellig of the '535's sound when this budget amplifier drove his ESL-63s. While not a powerhouse, it works well with speakers which usually demand a more expensive amplifier. Only negative point is the nonstandard output connectors. Some feel that the inexpensive '535 is actually the best-sounding Adcom amplifier—"Amazingly good" at its price, says Peter Mitchell. (Vol.10 No.8)

B&K ST-140: $498 ★
The 105Wpc MOSFET '140 costs little enough to make it into Class D, but the sonics, after extensive auditioning, convince ST that it belongs in Class C. LA disagrees, feeling that it should be "high Class D," and after his auditioning, JA also disagrees. The ST-140 features deep but not extraordinarily powerful (if mushy) low bass, and a tube-like tonality with a smooth, sweet midrange. Despite the Anarchist finding the '140 not to have "too much MOSFET mist," the amp's high frequencies can become a little tizzy, thought JA, while GI found disc surface noise to be somewhat accentuated. Latest production features a detachable IEC AC cable and gold-plated RCA input jacks. An important caveat to our continued recommendation of the ST-140 concerns the ability of the current version to drive real-world loudspeakers. With loudspeakers whose impedances drop much below 8 ohms, the amplifier is thermally limited from delivering much power without a significant increase in distortion, with a resulting hardness to the sound. More powerful ST-202 ($698, reviewed in Vol.10 No.8) has very similar sonic signature, according to ST, and is therefore to be recommended with a much wider range of loudspeakers than the '140. (Vol.7 No.4, Vol.10 No.7, Vol.11 No.10 mono version, Vol.12 Nos.4 & 12, Vol.13 No.1)

Parasound HCA-800 II: $395
See the "Follow-Up" review in this issue. (Vol.11 No.2, Vol.12 No.2, original version)

D (Integrated Amplifiers)
Arcam Alpha 2: $375
Inexpensive, the Alpha 2 sounds dry and bright in the treble, with a lack of soundstage dimension and "wooden" low frequencies, according to RH. Nevertheless, it represents a considerable improvement in sound quality compared with the mass-market Oriental norm, and therefore scores a recommendation. (Vol.12 No.9)

Audiolab 8000A: $695 ★
A little expensive for Class D, the full-featured Audio lab does not compete on absolute sound-quality grounds with the not-much-more expensive NA1T 2 or the less-expensive Creek 4140 S2, said RH in his review. It is considerably more powerful than either, however, and has impressively tight, well-defined low frequencies. Many will prefer its more upfront, more analytical balance, particularly with inherently dark-sounding loudspeakers. (Vol.9 No.1, Vol.12 No.9)

Creek 4140 S2: $550
Excellent soundstaging, with a sense of air and openness, coupled with "satisfying" bass reproduction, lead to a recommendation for this inexpensive British integrated. Top octaves a little forward, but not to the extent of either the Audiolab or Arcam models. (Vol.8 No.5 original version, Vol.12 No.9)

K
Threshold SA/12, Manley 350 monoblock, Jeff Rowland Model One, Classé DR-8.

Deletions
Electrocompaniet AW100 replaced by identically priced, dual-mono AW75; Krell KSA80B replaced by KSA150; Conrad-Johnson MV-50 replaced by MV-52; none of these yet auditioned.

Loudspeaker Systems
A
Editor's Note: The argument among Stereophile's contributors as to whether the B&W 801 Matrix—see entry—should be included in Class A leads me to emphasize to prospective purchasers of Class A loudspeakers that four of the following seven models make great demands that the amplification and source components also be of Class A caliber if the sound is not to be compromised. It should also be noted that there are potential Class A loudspeakers—the Infinity IRS V, Wilson Audio WAMM—that we have not heard in familiar surroundings and therefore cannot include in this listing.

Apogee Diva: $8250/pair
That classic, idiosyncratic Apogee balance—full bass and depressed treble—doesn't detract from AB's feeling that this three-way, full-range ribbon has the finest ability to communicate the essence of a musical event that he's ever heard. Seamless transitions between the drivers, vivid, stable imaging that envelops the listener, and an ease in handling wide-range, dynamic peaks lead to a Class A recommendation. Dedicated electronic crossover—the $3995 DAX or less-featured DAX II at $1995, reviewed in Vol.13 No.8—leaves the matter in no doubt. West Coast price: $8400/pair. (Vol.11 No.8)

Avalon Eclipse: $5600/pair
Although a review is currently in progress, preliminary results suggest that the two-way Eclipse deserves a Class A rating, feels JA. A warmer balance than the Hales is coupled with astonishing midrange transparency, beautifully delineated soundstaging, and a freedom from coloration that allow the music to communicate most effectively. Price refers to a faux granite finish; a non-rainforest veneer finish adds $1600/pair. (NR)

B&W 801 Matrix Series 2: $5900/pair
A complete redesign of the classical recording industry's standard monitor loudspeaker—aluminum-dome tweeter, extension to 19Hz with the help of a line-level equalizer, and B&W's patented "Matrix" enclosure, where the cabinet is effectively transformed into a solid body—has resulted in a moving-coil speaker capable of competing with the best planars. As LL put it, "a true musician's reference transducer." Strengths include excellent low-frequency definition and weight, a highly detailed midrange, and unrestrained dynamics. Bass-alignment filter now included in purchase price. Best used with stands: we have had good results with
the Sound Anchors and with the wooden, sand-filled Arcardis. (Also see Vol.12 No.10, p.45, and Vol.13 No.2, p.217, for discussions of a simple crossover adjustment that improves the sound.) There is strong disagreement among Stereophile’s reviewers whether the 801 is a true Class A loudspeaker system. LL makes a strong case that it should be on the grounds that its flaws are nowhere near as severe as the other speakers in this class, meaning that it is more likely that an 801 owner will get Class A sound than owners of the other recommended models. This is particularly true if the bass filter is replaced by one of the after-market models, such as those from Discrete Technology and Denver dealer Listen-Up (the Maugham-Box). AB, however, strongly feels that the 801 doesn’t come close to the Apogee Diva in overall performance of a musical experience, while DO (without having heard the 801 in his own system, it should be noted) is scornful of the notion that a dynamic speaker can belong in the same class as the electrostatic Sound-Lab. BS and RH also feel the 801 to more properly belong in Class B. T. J. N., who also owns a pair, hasn’t volunteered an opinion. All of which suggests that those with wallets capable of stretching to accommodate a putative Class A loudspeaker should listen to the 801, then make up their own minds. (Vol.10 No.9)

Hales System Two Signature: $4850/pair

A beautifully made two-way, dual-woofer design with a resonance-free cabinet featuring a 4” baffle and a physically separate crossover, the 18lb System Two Signature displaced the B&W 801 from RH’s listening room. His characterization of the Hales’s sound: “precise, controlled, detailed, meticulous, exact, finesse.” Though the treble is both clean and transparent, a slight propensity for on-axis brightness can be ameliorated by experimenting with toe-in. Compared with the 801, the Hales offers superior dynamic detail, even though it lacks the British loudspeaker’s low-frequency weight. In fact, the main fault of the Hales is a lean, rather over-damped bass balance which can be unforgiving with some ancillaries and in some rooms. In J. A. S’s opinion, the appearance of loudspeakers like the Hales, the Thiel CS5, and the Avalon Eclipse implies that this is a Golden Age for high-end moving-coil loudspeaker design. (Vol.13 No.7)

Infinity IRS Beta: $11,950/pair

Full-range, five-way, electrodynamic area-drive system with separate stereo, moving-coil subwoofer towers and servo/crossover electronics. Capable of being fine-tuned almost ad infinitum. At its best with tube electronics on the panels (ARC preamp and VTL 300 and 500 power amplifiers, for example), which will ameliorate the tendency for the upper octave to be somewhat exaggerated in level, and needing a big room to allow sufficient distance for the sound from the individual drive-units to properly integrate, the Beta is the best speaker. JGH has auditioned in terms of transparency, harmonic accuracy, and the ability to convey the dynamic scale of a recording. (In this last respect, the Beta is the best speaker system JA has auditioned.) Extreme versatility offered by low-bass controls helps in getting flat, high-level, extended (to below 20Hz), in-room LF response, provided that a beefy amplifier (Krell, Mark Levinson, etc.) is used. Lower treble can sound rather “zingy” with the wrong ancillaries, but this can be significantly ameliorated by covering some of the tweeter and supertweeter radiating areas with tape. Imaging precision on the original review samples was less good than expected, due to a slightly out-of-spec crossover and drive-units on one side. Infinity promises that good QC will be a major concern of theirs from now on; to judge by the most recent samples to be auditioned in Santa Fe, this does appear to be the case, though a thorough reread of the “Follow-Ups” in Vol.12 Nos.1, 6, & 12 is a prerequisite, as is in-store audition, prior to making a purchase decision. (Vol.11 No.9, Vol.12 Nos.1, 6, & 12)

Sound- Lab A-3: $7410/pair

JGH’s preferred reference loudspeaker, this big, curved-panel, full-range electrostatic features a stunningly natural midrange. Warm-balanced, the treble is sweet and musical. DO feels the A-3 to be the best electrostatic speaker he has heard, though he does point out that its imaging is less well-defined than that typical of a good minimonitor. Sensitivity and dynamic range are on the low side. Latest version has a revised HT power supply, resulting in slightly higher sensitivity and an improved dynamic range. The previous Class B ranking for this speaker was due to JA feeling that it persistently lacked mid-treble transparency, being rather aggressive and grainy in this region. Recent auditioning with the VTL 300 amplifiers revealed that this had much more to do with the solid-state amplifiers with which JA had heard it in JGH’s system, leading to a consensus that the A-3 does deserve a Class A recommendation after all. Latest version features optional “wings” to lower the baffle cancellation frequency and thus extend the bass, as well as improved power handling. (Vol.9 No.6, Vol.11 Nos.6 & 11)

Thiel CS5: $9200/pair

A 180lb, five-way, six-drive-unit speaker with a cast “marble” baffle, the CS5 is the most expensive and complex loudspeaker ever to come from Jim Thiel’s drawing board. Needs to be listened to at least 8’ away; then, on the upper-midrange axis, the sound is neutrally balanced, superbly colored, astonishingly detailed, and completely time-coherent, leading to possibly the most accurate, transparent, vivid presentation of the soundstage JA has ever experienced. This transparency is not achieved at the expense of the CS5’s ability to present the music in all its glory. LA felt the CS5s to be “immensely American . . . in their willingness to accept all comers”—with old recordings, “the music rang through,” he found. Horizontal dispersion is wide and even, leading to a lack of fussiness about toe-in, though vertically things are rather more critical: above and below the optimum axis, the sound can become too bright, while it can also lack body in the upper midrange. Both of these latter characteristics can be emphasized by unsympathetic room acoustics, which leads to great care having to be taken in selecting cables and ancillary components. With the appropriate amplification—the speaker’s 2-ohm impedance in this region makes great demands on the amplifier—the low frequencies are extended and powerful, if not quite as well-defined in the midbass and below as the best Class A competition. The CS5 does need great care taken in room placement, however, if the upper bass is not to become uneven and lumpy. While it isn’t a loudspeaker for Everyman and every room, in optimum surroundings and with the best matching ancillaries the CS5 is overall the finest moving-coil loud-
speaker in current manufacture, feels JA (though it is fair to point out that he has yet to hear either the Avalon Ascent or Wilson WATT/Puppy combination in familiar surroundings). (Vol.13 No.6)

B

Editor's Note: I make no apologies for the wide variety of loudspeakers listed in this group. Polling Stereophile's reviewers resulted in a total lack of consensus, implying that all the following speakers will, in the right room with the right ancillaries, give true high-end sound. Following the protests of many readers and, more important, pressure from JGH that small speakers should automatically be excluded from Class B because of their lack of LF extension, I have split Class B into two sections—full-range and minimonitors. To be included in Class B, a small speaker has to be at least as good in every other area as the full-range competition. (Note that all the full-range recommendations, with the exception of the Quad, Spendor, and Vandersteen, are floor-standing models.)

B—Full-range

Apogee Stage: $1995/pair

The diminutive Stage has one of the most neutral, seamless midbands around. Recorded voice is reproduced with an uncannily life-like quality. Imaging, too, is superb—"In terms of soundstage transparency, it rivals any loudspeaker money can buy," said DO—as is the speaker's presentation of recorded dynamics. The Stage works particularly well with Classe amplification and SYMO cable, but prospective purchasers should be prepared to experiment with room position and toe-in to get the optimum sound. Matching stands are also available for those who prefer a higher listening seat. (Vol.13 No.8)

Magneplanar Tympani IVa: $3750/pair

Offering excellent performance for their price, the IVas have exceptional high-frequency performance and a delicate midrange with excellent harmonic accuracy. Room considerations and placement are more important than with most speakers for proper imaging. Bass is good, but requires an amp with high current capability. Most serious weakness is a lack of impact, particularly in the lower midrange. (Vol.8 No.6)

Martin-Logan Sequel II: $2650/pair

(oak or black finish)

The revised version of this bi-wirable electrostatic/dynamic hybrid is a paradox, as from the midrange on up, it offers seeming imaging, natural tonal colors, and clean, grit-free highs, almost reaching Class A quality in these regions were it not for a definite dynamic threshold above which the sound becomes considerably more hard and brittle. But from the lower midrange down to, an extent very dependent on the power amplifier used and on the chosen listening axis, the sound can be anemic, leaving the mids and highs unsupported. This leads to a "threadbare" overall balance that particularly irritated the Audio Anarchist, though we understand that listening to the speakers from more than 15' ameliorates this problem somewhat. As supplied, the woofer and the electrostatic panel have the same acoustic polarity, which is strange in view of the symmetrical 12dB/octave crossover slopes—DO found the sound to be significantly improved for close-seated listeners if the woofer polarity is inverted. To an even greater extent than usual, prospective Sequel purchasers should listen for themselves with their chosen ancillaries before making any decision. (Vol.12 No.1, original version; Vol.12 Nos.8, 9, & 10)

Meridian D600 remote-control digital-input active loudspeaker: $5000/pair

Unique two-way from England includes power amplifiers, electronic crossover, optical and coaxial digital data inputs, 4x-oversampling digital filter, and 16-bit DACs, as well as a line-level analog input. Versatile remote control offers control of analog and digital input switching, level, channel balance, bass alignment, and tonal balance. All that is needed to make music is a CD transport. Speaker remote control also controls Meridian's 207 and 208 CD player/preamps and the 204 FM tuner/timer. Intrinsic tonal balance slopes down from bass to treble, though this is offset by an astonishing degree of clarity and the ability to present a wide, deep, detailed soundstage. Ultimate dynamic range limited by some midrange congestion and lower-treble hardness that sets in above 100dB. We understand that a revised version featuring Bistream DACs is due to be introduced sometime in 1991. (Vol.12 No.11)

Mirage M-1: $5000/pair

Tall, dark, and handsome, bi-wired, bi-ampable, bipo lar design from Canada that resembles, though not in sonic signature, the B&W 801 and Vandersteen 2CI, in that its fundamental sound quality seems much less sensitive than usual to the characteristics of the amplifier with which it is coupled. The bass is extended, the extreme highs perhaps a little wispy, but LA found the M-1 to be exceptionally well-balanced tonally, with the rare ability to draw the listener into the music even at low levels. (Vol.12 No.6)

Nelson-Reed 804B: $3250/pair

One of the few moving-coil loudspeakers to get a recommendation from J. Gordon Holt, the three-way, reflex-loaded 804B combines high sensitivity and astonishing dynamic range with deep, tight low frequencies and well-defined imaging. Overall balance is somewhat forward, while treble is not quite up to the standard set by other Class B contenders. (Vol.11 No.4)

Ohm Walsh 5 Revised: $6000/pair

Unusual in being the only omnidirectional loudspeaker to be recommended, the Ohm Walsh 5, with its unique inverted-cone, almost—full-range driver, has clarity and transparency to rival the best minimonitors, according to DO. Bass, with near-wall placement, is deep and full, coloration levels are low, and the soundstaging, though very sensitive to room positioning, is excellent. Piano-black finish adds $2000 to pair price. (Vol.10 No.4, Vol.11 No.8)

Quad ESL-63 US Monitor: $3990/pair

(stands necessary)

Very musical sound, with very low midrange coloration, natural, precise imaging, excellent soundstaging, and very good resolution of detail when listened to on the optimum axis. The highs roll off considerably off-axis, which can lead to a dull, lifeless sound in overdamped rooms. The low treble is a little resonant, which bothers some listeners (LA) more than others (ST, LG, DO). Low frequencies are tight but not very deep, while maximum-volume capability is somewhat limited. (In Santa Fe, with its 7000' altitude, this is a strict 97dB on peaks.) Later models are less dry-sounding

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than early production. Can really come alive with the right amplifier, and benefits from modifications, most especially suitable stands (we have found Arciics to work well). Aflonados should investigate the Celestial dual-mono subwoofers, which, being dipoles, stand a good chance of integrating in-room with the dipole Quads, while ZAS's HP has achieved excellent results matching the Quads with the woofer panels, also dipoles, from the Tympani IVa. (LG disagrees, feeling that the omnidirectional, servo-controlled Velodyne ULD-18 gives the optimum match.) The current version, the "US Monior," has a stiffer steel frame, a revised protective grille, and a reduced plate gap for higher sensitivity: (Vol.6 No.4 & 5, Vol.7 Nos.2 & 7, Vol.8 No.3, Vol.10 No.1, Vol.12 Nos.2 & 6)

Snell Type A/III Improved: $4680/pair

Ultraflat frequency response is coupled with a superb coupling of the low frequencies with the room acoustics, which leads to extended, powerful lows. Replacement of the original's Audax tweeter with a cleaner-sounding Vifa unit leads to the "improved" being added to this large floor-standing speaker's designation and a strong recommendation from Larry Greenhill, who feels it should be a Class A contender. A lack of treble transparency coupled with somewhat restricted image depth, however, mean that high Class B is probably the most suitable rating. Bi-amplification via the dedicated electronic crossover from db Systems ($602) significantly improves performance: (Vol.7 No.6, Vol.9 No.3, Vol.10 No.6, Vol.13 No.3)

Spendor $1000: $2500/pair (stands necessary)

Somewhat self-effacing quality compared with "audiophile" loudspeakers, thought ST, but the outstanding bass, smoothness and lack of coloration through the midrange, and the sweetness of the treble make this beautifully constructed British three-way a natural Class B recommendation. "No significant flaws," say both Martin Colloms and Mr. Tellig. $175/pair Chicago Speaker Stands speaker stands should be regarded as mandatory. (Vol.13 No.6)

Spica Angelus: $1275/pair

The first floor-standing model to come from this New Mexican manufacturer, this idiosyncratically styled speaker has much in common with the TC-50, including a superbly defined, if lightweight, bass register, a basically neutral, if occasionally "cardboardy" midrange, and the ability to throw an astonishingly accurate soundfield. Treble transparency is a little lacking when compared with the best Class B speakers, but still one of the best loudspeakers The Audio Anarchist has heard. LA demurs, due to the Angelus's slight departure from midband accuracy, while Martin Colloms points out that the speaker's unusual styling results in a somewhat deeper than usual "floor dip" in the lower midrange which can lend the bass a rather disembodied character. (Vol.11 No.2, Vol.13 Nos.1 & 4)

Synthesis Reference System: $7350/system

Close to achieving a Class A recommendation, this four-enclosure dynamic system was felt by JGH to have a slight lack of energy in the midrange which robbed orchestral crescendos of their full power. Nevertheless, extraordinarily precise yet spacious imaging and the deepest, smoothest bass he has heard in his listening room led JGH to label the SRS "superb," almost rivalling his beloved Sound-Lab A-3s in overall performance. (Vol.11 No.8)

Thiel CS3.5: $2650/pair

One of the finest US-designed box speakers, the 3.5 is the result of a long collaboration between designer Jim Thiel and the drive-unit manufacturers. Combines superb transparency and imaging with excellent low-bass extension — an active equalizer is used — though it relies on music having a normal spectral balance if the woofer is not to run out of excursion capability. (Organ recordings with sustained high-level pedal passages are to be avoided, for example.) A balance opposite to that of the Apogee Duerra, with a slight tendency to a tilted-up HF, makes careful system matching crucial. Its Dynaudio tweeter is perhaps outclassed in clarity by the SEAS unit Thiel uses in the new CS1.2, but the design's real Achilles Heel appears to be the equalizer, which compromises HF neutrality somewhat and is often outclassed by the electronics with which the 3.5 is used. (Vol.10 No.1, Vol.12 No.1)

Vandersteen 2CI: $1195/pair (stands necessary)

After 12 years of continual refinement, an excellent full-range box speaker. Balance of the 2C was a little rolled off in the highs, according to AHC, but the latest C1 revision has full measure up to 16kHz or so (though it lacks ultimate transparency in the high treble). Superb delineation of recorded detail, a neutral, tuneful midrange (apart from a degree of character/emphasis in the presence region), and low frequencies that are extended without the bass becoming too exaggerated, lend to a borderline Class B rating, but the fact that it would seem impossible to get anything less than a very musical sound from this speaker mandates a confident recommendation. TJN said it best in Vol.13 No.5: "The Vandersteens... is that rarest of audio products: a highly musical and accurate reproducer at a bargain price." The Audio Anarchist demurs, feeling the Spica Angelus is a better buy overall, the 2CI being too "Vandersweet." $260/pair dedicated Sound Anchor stands push the speaker's performance envelope further. (Vol.9 No.6, 2C; Vol.12 No.5, Vol.13 Nos.1 & 5, 2CI)

B — Minimonitors

Acoustic Energy AE1: $1500/pair (stands necessary)

Tiny reflex box with metal-dome tweeter and unique metal-cone woofer. Redefines the art of miniature speaker design, according to JA, due to its highly dynamic range capability, electrostatic-quality treble, and see-through, if somewhat forward-balanced, midrange. Now supplied ready for biwiring with gold-plated binding posts. Price with Alloy stands is $2150. (Vol.11 No.9)

Celestion SL600Si: $1999/pair (stands necessary)

Though lacking the bottom octave-and-a-half of bass extension, and possessing slightly depressed mid- and extreme treble ranges that make system optimization difficult, the SL600Si combines lower-midrange transparency and holographic imaging (areas where it seems off most of the moving-coil competition) with a musical, if dark-sounding, balance unique for a box speaker. Worth using with high-end electronics. Latest Si version has revised crossover layout to allow biwiring and is more transparent in the treble, though a touch of midband congestion remains. Good stands, such as
Celestion’s own $300/pair 18" SLs, is mandatory. (Vol.10 No.2, original version; Vol.12 No.5)

Celestion SL700: $2999/pair (stands included)
Very expensive for a small speaker, price includes excellent stands. Improves over the SL600Si in the areas where that speaker excels, and sets new standards for a box loudspeaker in transparency, neutrality, and upper-bass clarity. In contrast with the SL600Si, overall balance is rather on the bright side—a little like a moving-coil CLS—which demands careful system matching. Auditioning of a current production version (Spring ’90) reveals much better integration between the tweeter and woofer, though the tradeoff appears to be a less involving sound overall. Though the SL700 is deficient in low bass in absolute terms, rate of rolloff in-room is slow enough that it almost qualifies for inclusion in the “full-range” Class B category. But only almost. (Vol.11 No.9)

Ensemble PA-1: $2640/pair
Ensemble Reference: $4390/pair
(stands necessary)
Two almost identical-looking monitors from Switzerland, distributed in the US by Graham Engineering, combine an excellent soft-dome tweeter with an unusual laminated-cone woofer and a rear-facing passive radiator. Both sensitive to being overdriven by subsonics, but provided a good high-pass filter is used, the Ensembles generate a neutrally balanced if bass-heavy sound with better imaging—“spatial resolution was outstanding,” according to DO—and less upper-bass congestion than the Celestion SL600Si. The Reference betters the PA-1 in every way—at a cost. Both speakers require a considerable break-in period to reach their optimum performance. (Vol.13 No.6)

C

Acoustat Spectra 11: $1099/pair
Inexpensive floor-standing hybrid which combines a single Acoustat electrostatic panel with a moving-coil woofer. On the optimum listening axis, which is too high for a listener sitting in a normal chair, a clean treble and midband are offset by a slightly dull balance overall, while there is a bit of character in the presence region and the bass can be a little excessive in level in too small a room. “Unfailingly ‘musical’,” said TJN, however, of this “entry-level high-end” speaker system. (Vol.13 Nos.1 & 2)

Acoustat Spectra 2200 loudspeaker: $2250/pair
The Spectra 2200 uses two Spectra 11 electrostatic panels with electronic contouring applied to reduce the effective radiating width with frequency, thus minimizing that bugbear of wide-panel electrostatics, limited HF dispersion. With amplifiers of 100W output or more, the Spectra 2200 throws a wide, deep soundstage, though DO felt the mids to be a little recessed. Low bass is missing, but SWP-1 dual-mono passive woofer module ($600) usefully extends response to below 35Hz. Actual model reviewed was the Spectra 22; the 2200 sounds identical but is cosmetically somewhat different. (Vol.12 No.10)

Dahlquist DQ12: $1200/pair
Unusually styled, three-way design, with midrange and tweeter mounted on a separate haffle atop the sealed-box bass bin. Low frequencies are rich and full, the soundstaging and imaging superb. The original review samples, however, had a rather exaggerated treble region, which, while making the sound very open and “airy,” over-accentuated the speaker’s presentation of recorded detail and made LP surface noise more audible than usual. A second sample, described in this issue’s “Follow-Up” section, seemed better balanced in this respect, leading to a cautious Class C recommendation. (Vol.13 Nos.4 & 10)

Epos ES-14: $1195/pair (stands necessary)
A speaker that has long been a Cheapskate favorite, the ES-14 seems to be typical of small British speaker designs in that it features a metal-dome tweeter in a well-braced cabinet with a minimal crossover and the option for bi-wiring. The result is a superbly coherent sound that, according to TJN, kept drawing him into the music. Ported bass is both a little lightweight and somewhat soft, but the upper bass and midrange are very low in coloration, with excellent transparency. Matching stands are available for $200. (Vol.11 No.6, Vol.13 No.1)

Focal Aria 5 kit: $700/pair (stands necessary)
(See Dick Olsher’s review in this issue)

Image Concept 200: $1000/pair
“The deepest bass per dollar,” thought JA of this elegant, floor-standing, two-way design from Canada. An otherwise excellent soft-dome tweeter is a little sizzly in the upper treble, with a slight tendency for the sound to harden at very high levels. Sensitivity on the low side, which, coupled with the low impedance, will mean more careful amplifier matching than usual. Excellent image definition, however, and overall, an impressively neutral balance. Good things are coming out of Canada these days, perhaps due to the excellent facilities offered to designers by the Canadian National Research Council. (Vol.11 No.8)

Monitor Audio MA952 Gold: $1800/pair
High Class C performance with the right ancillaries from a floor-standing English loudspeaker equipped with twin woofers and a fine aluminum-dome tweeter (anodized a gold color in the latest version). Coloration levels are mild, apart from a somewhat lively box, though the balance is a little forward in the presence region, which is particularly unkind to CD. This is offset by highish sensitivity and an astonishing transparency in the midrange and treble, presumably due to the minimalist crossover. Sealed-box bass is lightweight but articulate, with reasonably good extension. (Vol.11 Nos.1, 2, & 5)

Rauna Balder: $1500/pair
Unusually styled two-way floor-standing design with cast-concrete enclosure (which can be painted to match room decor) and a rear-mounted port. Though said to be a transmission line, bass loading is more akin to reflex and a little loose. High treble is dull, but apart from those minor defects, this speaker has a superbly neutral midband and clean mid-treble. (Vol.11 No.6)

Rogers LS7: $999/pair (stands necessary)
Well-finished two-way, reflex-loaded dynamic speaker with a classic “British” balance—uncolored midband, superb imaging, and a rather ripe upper bass. Good stands are mandatory, as is placement well out in the listening room. Sounds best with grille on. Tendency to hardness in the lower treble will make demands on matching electronics. (Vol.12 No.12)

Rogers LS3/5a: $799/pair (stands necessary)
A major revision of the crossover in 1988 was meant...
not so much to “improve” this venerable design (first seen and heard in 1975) as to bring production back on target. Still somewhat compromised concerning overall dynamics and HF smoothness and clarity when compared with Class B miniatures such as the Acoustic Energy AE1, Celestion SL600SI and SL700, and having a distinctly tubby midbass, the 1989 version of the LS3/5a still has one of the least colored midbands around, throws a deep, beautifully defined soundstage, and has a slightly sweeter top end, with less nasality apparent than it used to have. The sound, however, is sometimes not as musically involving as it could or should be. The LS3/5a is also being manufactured by Spendor, Harbeth, and Goodmans, and differences among any current LS3/5as should be cosmetic only. (Vol.3 No.12, Vol.4 No.1, Vol.7 No.4, Vol.12 Nos.2 & 3)

Signet SL280: $900/pair (stands necessary)
(See T'JN's review in this issue)

Snell Type Q: $780/pair (stands necessary)
Small speaker which successfully takes on the British on their own ground. An open, airy quality, excellent delineation of soundstage depth and width, low levels of midrange coloration, though treble is perhaps a little unforgiving compared with, for example, the Epos ES-14. Matching stands cost $120/pair. (Vol.11 No.6)

Spica TC-50: $550/pair (stands necessary)
The coherence and imaging of the mid- to upper midrange rival the Quad and LS3/5a and would be considered excellent in a speaker of any price; at $550 they are a steal. Only significant drawback is the absolute need for the listener to be sitting with his or her ears on the optimum axis, the sound otherwise becoming too lean. On the optimum axis, the high frequencies roll off above 16kHz, the midband is rather forward-balanced, and the low end is designed to be very controlled down to the lower limit of about 55Hz. This latter aspect makes the TC-50 perfect for matching to a subwoofer—a pair of Kineergies BSC-SW100s with their stands and matching amplifier are ideal. Easily damaged by amplifier overload. Latest version features a cross-brace between front and rear panels. (Vol.7 Nos.2 & 3, Vol.9 Nos.5 & 7, Vol.11 No.1, Vol.12 No.10)

SR Bolero: $1549/pair (stands necessary)
This Swiss reflex-loaded minimonitor’s good dynamics, fundamentally neutral tonal balance, and excellent upper-bass definition are let down by the rather fizzy highs characteristic of its Focal tweeter, which also reduces image depth in this region. Works best with tube amplification. Matching Forté stereo woofers increase dynamic range but at the expense of upper-bass smoothness. (Vol.12 No.4)

Synthesis LM-210: $1195/pair (stands necessary)
Excellent dynamics and very transparent sound from this floor-standing model, coupled with a good standard of neutrality. (Vol.10 No.8)

TDL Studio 1: $1445/pair (stands necessary)
Midband and upper bass have a little too much character in absolute terms, felt JA, but the transmission-line Studio I features excellent bass extension for what is basically rather a small two-way loudspeaker. Dynamics are somewhat limited, but the Studio I features a very clean treble and excellent soundstage presentation. Matching stands cost $180/pair, but should be considered essential in order to place the listener’s ear on the optimum axis, the sound being otherwise too hollow-sounding. (Vol.13 No.2)

Thiel CSI.2: $1250/pair
Borderline Class B, lacking only ultimate dynamic range, this modest-sized floor-standing speaker offers an outstandingly detailed sound with superbly precise if a little shallow soundstaging, a neutral midband, and a less critical treble balance than the older CS2 (although VTL monoblocks produced rather a "hissy" sound). ST reports that the Electrocompaniet AW100 sounds terrific with the 1.2s. Low frequencies are full, but only become too ripe when used with say, a tube amplifier, states JA. ST demurs, feeling that the bass was a little lightweight, which might suggest some room dependency in the low-frequency balance. A best buy at the price, nevertheless. (Vol.12 Nos.1, 6, & 11, Vol.13 No.1)

Thiel CS2: $1650/pair
The CS2 is more amplifier- and front-end-fussy than the other Thiel speakers—anything too extended or peaky preceding the speakers will make the sound too relentless. It will be harder to get the CS2 to perform at its best than, say, the CSL.2, but in the right system the 2 will offer remarkable coherence, excellent imaging, a natural midrange, and extended highs. (Vol.8 No.6, Vol.12 No.1)

D
Cambridge SoundWorks Ambiance: $250/pair (stands necessary)
Tiny, well-finished stand-, wall-, or shelf-mounted two-way speaker available only via mail-order (S&H add $10 to the quoted price). (Full customer support is provided.) Midrange rather forward in balance, accentuated by rather shut-in but lisspy highs and a necessarily limited bass extension. The mids also lack clarity. Nevertheless, the Ambiance offers a surprisingly musical sound overall, and can be recommended for second-system use or as ambience speakers in a video-surround setup. Oak cabinets are available for an additional $48/pair. (Vol.13 No.3)

Celestion 3: $280/pair (stands necessary)
Intended to be sited near a rear wall on a stand or shelf, which usefully reinforces its limited low-frequency output, the diminutive 3 has a rather “cardboardy” coloration in the midband but a clean, open-sounding treble unusual in this price range. (Vol.12 No.10)

Dana Audio Model 1: $179/pair (stands necessary)
By far the least expensive loudspeaker listed in “Recommended Components,” Dana's Model 1 is only available via mail-order. A rather warm bass and a rather lifeless, depressed treble lead to a forgiving balance offset only by a degree of resonant coloration in the low treble. “Squeezes the most music out of the least money,” according to RH. Slight changes to the tweeter level have been made since the review appeared. (Vol.13 No.9)

Magneplanar SMGa: $575/pair (stands necessary)
Musical sound, with relatively well-extended low frequencies, considering the size of the panel. Not that transparent in the midband, and high frequencies recessed, but a musical bargain nonetheless. (Vol.10 No.7)

Monitor Audio R300/MD: $599/pair (stands necessary)
A forward midrange and slightly indistinct upper bass
are offset by excellent imaging and a generally smooth, detailed treble. Should work well with inexpensive amplification. (Vol.12 No.4)

**Monitor Audio Monitor 7: $399/pair (stands necessary)**
The Monitor 7 is "smoother through the treble than the Celestion 3, better focused, and better finished too," says the redoubtable Mr. Tellig. JA concurs, feeling that its midrange is also less colored, but points out that the 75 more peaky treble balance will be fuzzier regarding matching amplifiers and CD players, and adds that he finds its reflex-loaded low frequencies to be fuzzier, less well-defined, than the sealed-box Celestion's. (Vol.13 Nos.1, 2, & 3)

**NHT 1.3: $480/pair (stands necessary)**
Unusual styling but a superb level of fit 'n' finish distinguishe this small, inexpensive loudspeaker. Its midrange is neutral, its high frequencies clean and free from resonant hash, though low frequencies lack a little weight. Sound quality overall is borderline Class C with the right ancillaries—"the NHT 1.3 excels in those areas that are most important musically," stated RH. (Vol.13 No.9)

**Paradigm 5se: $349/pair (stands necessary)**
A rather soft midbass, a slightly colored midband when compared with the better Class D loudspeakers (including the Paradigm Control Monitor below), and a typical soft-dome tweeter, but excellent performance at the price. A well-balanced design. Needs to be used on good stands. (Vol.11 No.1)

**Paradigm Control Monitor: $680/pair (stands necessary)**
A rather loose upper bass and a cold tonal balance do not detract from this Canadian speaker's having an excellent performance overall at this price level. Neutral midband but rather shallow imaging. (Vol.12 No.12)

**Rauna Freja: $725/pair (stands necessary)**
This concrete-enclosure two-way features rather a forward midband but throws a wide, deep soundstage with low levels of resonant coloration. Verge on Class C sound quality with the right ancillaries. (Vol.12 No.1)

**Rauna Tyr II: $725/pair (stands necessary)**
A small, concrete-enclosure loudspeaker with very smooth, neutral, musical balance and excellent imaging and soundstaging. A good musical buy. (Vol.9 No.2)

**Spectrum 208B: $449/pair (stands necessary)**
Easy to drive and possessing excellent bass extension and a clean treble, the 208B is let down by relatively high levels of midrange coloration. (Vol.12 No.1)

**Tannoy E11: $369/pair (stands necessary)**
A basically flat response with a coloration-free midrange, an open, expansive soundstage, and a well-defined bass is offset by a degree of treble hash. "Eminently musical for its price," thought RH. Bi-wiring recommended. (Vol.13 No.9)

**K**
ATC SCM20, Monitor Audio Studio 10, PSB Stratus Gold, Mirage M-3, Avalon Ascend, Infinity Modulus, KEF R105/3, Snell K2, Wilson WATT IIs/Puppies, Magnepan MG3.3 & MG2.6, JBL XPL160.

**Deletions**
After many years in "Recommended Components," the Magnepanar MGIIA has been replaced by the MG3.3; likewise, the MG2.5/5 has been replaced by the MG2.6. Kindel Purist LT no longer available, to the best of our information. PSB Stratus replaced by Stratus Gold.

**Subwoofers & Crossovers**

**Editor's Note:** You will see from Dick Olsher's mini-survey in Vol.12 No.1 that true subwoofers, capable of reproducing the bottom two bass octaves at realistically high sound levels, are rare and expensive beasts. In addition, the problems of integrating one or two subwoofers with high-quality satellites are major if the integrity of the upper-bass/lower-midrange region is not to be compromised. There are no Class D subwoofers listed: we strongly recommend those trying to subwooof on the cheap to instead look at the possibility of acquiring more expensive full-range loudspeakers.

**A**

**Threshold PCX electronic crossover: $1600**
Available in two versions, offering either selectable crossover frequencies from 75Hz to 1602Hz or 750Hz to 16,020Hz, the PCX offers fixed 18dB/octave slopes and matches the Threshold FET-10 in appearance. Sonically the most transparent crossover DO has yet auditioned. (Vol.12 No.1)

**Velodyne ULD-18 subwoofer: $2959**

(lsc. crossover, amplifier, and servo electronics)
LG felt this well-finished, servocontrolled subwoofer system to offer the best bass performance he had experienced, extending his Quad US Monitor's low frequencies to 20Hz even at high levels, and adding a considerable degree of dynamic contrast. Though Peter Mitchell would agree with a Class A rating for the ULD-18, DO disagrees, feeling the Velodyne belongs in Class B due to an overall lack of absolute definition. It is fair to note, however, that DO derives his opinion from auditioning the Velodyne at hi-fi shows where the subwoofer would undoubtedly have been turned up too high. (Vol.12 No.10)

**B**

**Celestion System 6000: $2999/pair (inc. crossover)**
20Hz bass extension, though not at high levels, with excellent transient performance and dynamic range due to its using four 12" drive-units. Dipole radiation pattern makes system optimization a less thankless task than usual (Celestion can supply detailed set-up data to System 6000 owners who send the company a diagram of their room). Though expensive, not even including the need for a separate stereo power amplifier, the System 6000 is worth auditioning with both the Quad ESL-63 and the Martin-Logan CLS to endow those systems with bass extension and low-frequency power handling (though DO and LG feel that the system's fundamentally excellent performance is compromised by the quality of the line-level controller/equalizer). Note that LG feels the System 6000 to be incapable of competing with the Velodynes in terms of being able to reproduce the power of live low frequencies. (Vol.10 No.2, Vol.12 Nos.1 & 10)

**Nelson-Reed 1204/P subwoofer: $1200 each**
Four 12" drive-units in an IB enclosure, with two used

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in stereo, gave flat extension to 20Hz with high
dynamic range in Gordon's room, though with a less
smooth characteristic, despite careful positioning, than
the Synthesis Reference System's against-the-wall
towers. "P" revision can be run in 2-ohm mode. The
high-pass satellite feeds of Nelson-Reed's all-active AC-1204
electronic crossover ($570) are sealed; the same
company's PC-1204 passive high-pass unit ($50) should
be regarded as essential. (Vol.11 No.4)

**Velodyne ULD-15 subwoofer: $1795**

**(inc. crossover, amplifier, and servo electronics)**

A smaller version of the Class A ULD-18, the 'IS
imposed more of a signature on the music, thought
LG, shrinking his Quads' soundstage and somewhat
diminishing their depth. (Vol.12 No.10)

**C**

Audio Concepts Saturn subwoofer:

$699/pair (kit)

Using two 12" woofers in a compound configuration,
the Saturn achieves moderate extension and in kit form
offers good value for money. The drive-units have suffi-
cient dynamic range to make it worth experimenting with
equalizing the Saturn's response to be flat to 201z.
Kit w/o cabinets: $280. (Vol.12 No.1)

Audio Control Richter Scale Series III equalizer:

$349

Versatile six-band, half-octave, low-frequency equalizer
and analyzer incorporating 24dB/octave crossover fac-
tory preset to 90Hz. Slightly "muffled" in sound quality
when compared with the Threshold, the Richter Scale
nevertheless offers the woofer fan the best chance of
achieving a successful integration between sub-
woofer(s) and satellites. (Vol.12 No.1)

Kinergetics BSC SW-100 subwoofer system:

$990/pair

Kinergetics BSC SW-200 subwoofer interface
and stereo bass amplifier: $725

Using a pair of 10" drivers per side, the Kinergetics sys-
tem achieves true 20Hz extension but at the expense of
a limited dynamic range. In the right circumstances,
however, particularly with Spica TC-50s, it can work
very well, producing a full-range sound that can be
intensely musical. (Vol.12 No.1)

Sumo Samson subwoofer: $750

Massive, large enclosure uses a reflex-loaded 15" driver
to give high power handling and extension to 20Hz
(-3dB) when used with the Sumo Delillah crossover,
which incorporates suitable EQ. Effective and cost-
effective means of adding extension to a typical
minimonitor-based system, but highish-Q bass tuning
means that system/room optimization can be a some-
what protracted affair. JA noted, to his surprise, that
when set up correctly, a stereo pair of Samsons added
considerable image depth and stability to the sound of
Celestion SL600s. He has also heard a pair of Sam-
sons working well with Martin-Logan CI.Ses. (Vol.11
No.4, Vol.12 No.1)

Sumo Delillah stereo electronic crossover: $550

Featuring independently switchable high- and low-
pass crossover frequencies, Bessel-type filters, low-
pass slope selectable between 12 and 18dB/octave, low-
pass level control, a bypass switch, and both mono
and stereo inverting subwoofer amp
outputs, the Delillah is the most versatile means of
integrating one or two subwoofers into a system JA has
found. High-pass output is not quite as transparent in
the treble as a straight-wire bypass. (Vol.11 No.4)

**K**

Bryston 10B electronic crossover.

**Deletions**

Cogan-Hall ContraBass 12 subwoofer discontinued.

**FM Tuners & Antennae**

**Editor's Note:** Larry Greenhill recommends that
those interested in purchasing a good FM tuner read J.
Gordon Holt's and Donald A. Scott's discussion on
reviewing and measuring FM tuners in Vol.7 No.7,
pp.54–57. (See the advertisement elsewhere in this
issue for information on ordering back issues of Ste-
reophile.)

**A**

AudioPrism 7500 indoor FM antenna: $190

Low- VSWR (Voltage Standing Wave Ratio), vertically
polarized, omnidirectional indoor passive design that,
like the Day Sequerra, will prove optimal in urban
high-signal-strength areas. 89.5" height. (Vol.12 No.5)

BP FM-9700 active antenna: $40

Excellent directional indoor antenna offers 6dB
improvement over conventional T-shaped dipole
antenna. (Vol.11 No.10)

Day Sequerra FM Studio Monitor: $3800

With a styling similar to the same company's FM Broad-
cast Monitor, the FM Studio Monitor is a completely
new design, built to the same exacting standard.
Balanced outputs are provided. Compared with the
Broadcast Monitor, selectable IF bandwidth leads to
improved adjacent-channel selectivity and lower audio
THD. The sound, however, was where this tuner
scored, being, according to LG, "as good as any source
I now have in my system," with a "see-through quality
that just doesn't happen with any unit I have ever heard
in my system." LG also commented on the Studio
Monitor's "extraordinary" dynamic range and en-
hanced presentation of inner detail. (Vol.13 No.1)

Day Sequerra FM Urban indoor antenna: $285

Low- VSWR, omnidirectional, vertically polarized, 5'-
high indoor passive design optimized for metropolitan
reception in areas of high signal strength. (Vol.12 No.7)

**Magnum Dynalab 205 FM Booster: $229**

Not a tuner, but an excellent RF amplifier to optimize
selectivity and reception in areas of poor signal
strength. (Vol.10 No.6)

**Magnum Dynalab Etude: $1295**

Based on the well-established FT-101A, the Etude fea-
tures a machined faceplate, WBT output jacks,
audiophile-quality passive components, and two extra
hours of component selection, matching, and testing
during its manufacture. The result is a tuner that sounds
only slightly noisier than the extraordinarily expen-
sive Day Sequerra Broadcast Monitor with the same
antenna and station, and features a distortion-free mid-
range with strong dynamic contrasts. "The sound was
wonderfully free of hash, distortion, grit, and glare,"
said LG. His overall conclusion? That the Etude "rep-
resents one of the better balances of price and perform-
ance you can find in FM tuners today." (Vol.13 No.8)

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B

AudioPrism 6500 FM Antenna: $90
(wood cabinet)
If you don't have the room for an external FM antenna, then the diminutive 6500 could be a good substitute, offering good reception except for DX-ing purposes. A lot more effective than the small, active, omnidirectional antennae offered by some companies, thought BS. (Vol.13 No.9)

Denon TU-800: $500
Excellent sound—"smooth and tubelike"—coupled with good RF performance, particularly adjacent-channel selectivity, and very low distortion in super-narrow mode. (Vol.11 No.5)

JVC FX101OTN: $480
Very quiet backgrounds, coupled with excellent RF performance, apart from image rejection. Model reviewed was the almost identical FX-1100 BK. (Vol.12 No.4)

Luxman T-117: $600
"One of the best-sounding tuners ever!" said DAS in his review of this extremely sensitive tuner, pointing out its very low distortion. Borderline Class A. (Vol.11 No.2)

Magnum Dynalab FT-101A: $775 ★
An analog tuner, the FT-101A is superb from an RF standpoint, particularly in quieting and sensitivity. Selectivity is bettered only by the Onkyo, Denon TU-800, and Citation 23, but the '101A consistently sounds superior on most stations. Examination of three different samples confirmed good quality control as of February 1988. Latest version has instant-on feature, defeatable stereo blend, and new board. (Vol.8 No.4, Vol.10 No.3, see also Don Scott's "Follow-Up" review in this issue)

Onix BWD1: $885
Minimalist design with separate power supply, but a sound "transparent to the music source," with good soundstaging. Will give excellent sound, as good as that of the Luxman T-117, with classical stations broadcasting a clean, uncompressed signal, but not as good at snapping signals from the ether. Among the best-sounding tuners. (Vol.10 No.8)

Onkyo T-9090 II: $750 ★
This Mk.II version of an old favorite is an excellent-sounding tuner in its Wide mode, offering very low noise and superb stereo separation, though switching to Narrow or Super-Narrow noticeably degrades audio quality. Bass response is quick and dynamic. RF performance is excellent, though not as good as the Luxman T-117 in fringe reception areas. (Vol.11 No.5)

Proton AT-670: $400
"Exceptionally smooth" sound on FM, with a natural tonal quality and wide soundstage, thought DAS, especially with weaker FM stations. Lacks ultimate selectivity and AM section has poor sensitivity. Features Schottz noise reduction. (Vol.13 No.7)

Revox B-260-S: $1675
Ergonomics are initially daunting—there are 60 presets—but once set up, this beautifully constructed, very sensitive, very selective tuner was among the easiest to use. Audio quality on the Narrow IF bandwidth setting was excellent—"no harshness, no SCA birdies"—though not in the class of the Day-Sequerra models, felt LG. B208 remote control costs an extra $160. Significantly less expensive B-160 ($795) preserves much of the 260's audio and RF performance. (Vol.12 No.7)

C

Harman/Kardon Citation 23: $699
Excellent selectivity—"it can separate closely spaced stations where others fail"—but sensitivity rather on the low side. Excellent AM section, FM fine-tuning, topnotch sound. (Vol.10 No.8)

Magnum Dynalab FT-11 FM tuner: $449
Borderline Class B tuner, according to DAS in his review, that lacks transparency when compared, for example, with the more expensive FT-101. This is perhaps due to its having a single, narrow IF bandwidth. Has good selectivity and a very effective high-blend circuit for receiving weak stations in acceptable stereo. (Vol.12 No.10)

Onkyo T-4700: $450
Superb "signal-sniffing ability," noted DAS, which, combined with excellent adjacent-channel selectivity, leads to a "tuner that will miss few... signals delivered to its antenna jacks." Sound quality not quite up to the standard set by the other two Onkyo tuners recommended in this listing, however. (Vol.13 No.5)

Quad FM4: $695 ★
Good-quality construction, though only eight presets. Very sensitive with flawless audio if properly aligned. Lacks high adjacent-channel selectivity, switchable IF bandwidth, and mono/stereo switch. (Vol.8 No.4)

D

Adcom GTP-400: $380
Excellent budget-priced preamplifier, with integral FM/AM tuner offering good sensitivity but only reasonable selectivity. (Vol.12 No.9)

Arcam Alpha 2: $375
Warm tonal balance, excellent stereo separation, but only average RF performance. (Vol.12 No.7)

Hafler Iris: $450
Remote-control FM tuner that connects to the matching Iris preamplifier via a ribbon-cable link and can be controlled by the preamp remote. Having much in common circuit-wise with the DH-330, it offers audio with exceptionally low distortion and a slightly dry balance. Tuning is clumsy; however, requiring two buttons to be pushed, while DAS was also disturbed by the fact that it tunes in 50kHz intervals. RF performance is only average, with limited selectivity and poor immunity to SCA and FMX spurious. (Vol.13 No.2)

Marantz ST-54 AM/FM tuner: $420
Very sensitive, particularly in mono, but limited adjacent-channel FM selectivity. Ability to tune in 10kHz steps makes it suitable for receiving cable signals. Gold finish and rosewood end panels add $80 to price. (Vol.12 No.10)

Proton 440: $300 ★
An excellent Schottz noise-reduction tuner. Superior fringe performance when high adjacent-channel selectivity is not needed. Audio OK. (Vol.8 No.1)

Bogen TP-100A: $256 ★
$199 from Fordum Radio (see Magnum review in Vol.12

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A very clean sound, good stereo. Small size, good looks make it a good choice where space is a premium. Usable only for medium-strength signals. Sensitive AM. (Vol.9 No.3)

Deletions
Hafler DH-350 replaced by Iris tuner; NECT-710 no longer distributed in US.

Signal Processors
Editor's Note: I feel that to continue to recommend dynamic-range expanders, compressors, aural exciters, equalizers, ambience extractors, etc., is not in the true spirit of high fidelity, where the reproduction should be true to what the engineer and producer intended. The only processors I would recommend are those which can prove useful in rendering acceptable the playback of historical material. JGH, however, disagrees forcefully, feeling that equalizers, in particular, should be given high-end special treatment for the correction of program deficiencies in the almost ubiquitous absence of tilt controls; as does BS, who states, "What this country needs is an audiophile-quality, $1000 equalizer." Peter Mitchell also disagrees, on the grounds that "the true spirit of high fidelity" could mean either "re creating a lifelike illusion of music, by whatever means necessary, or literal reproduction of what is on the disc — no matter how falsely equalized, compressed, or colored that signal may be." He goes on to say that "with the best recordings, these goals may coincide, but not as a general rule. Case in point: Apogee speakers are inaccurate reproducers, but their fat bass and rolled-off top are partly responsible for their ability to recreate the sound you hear at a concert. Without the aid of equalizers or other modifiers of tonal balance, how can the radically different-sounding Apogee Diva and Acoustic Energy AE1 both be called 'high-fidelity' reproducers? If either is regarded as plausibly accurate, the other will need radical help from an equalizer to sound OK." OK?

A
Accuphase G-18 graphic equalizer: $5450
Very expensive 33-band equalizer has less deleterious effects on the signal than any other such device JGH has tried. Constant-Q bandpass/cut filter design leads to minimum overlap between adjacent bands. Best used for system EQ rather than for program. (Vol.11 No.4)

Packburn 323 A noise-reduction device: $2650
Quite expensive, and frankly intended for professional (archival) use, the Packburn is the best such device made. It can remove the maximum of surface noise—sticks, pops, and hiss—from shellac or vinyl discs with a minimum of signal degradation. (Vol.5 No.8)

K
Cello Audio Palette.

Dolby MP Surround-Sound Decoders
Editor's Note: Although BS argued cogently against the use of a Dialog-channel center speaker in his Dolby decoder reviews, it must be pointed out that when several listeners are involved, as will often be the case with movies, a center speaker will be essential if those well off the central axis are to receive a sound localized at the screen position.

A
Share HTS-5300 Dolby surround-sound processor: $999
Full logic action and remote control. Individual trim-pot level controls are provided for all six outputs, but can only be accessed from underneath. Only processor "to preserve the width, depth, and spaciousness of the soundfield," said BS, with a clear and open sound quality and stable, crosstalk-free decoding action. (Vol.12 Nos.8 & 11)

B
Lexicon CP-1 processor: $1395
Uniquely, Dolby Pro-Logic decoding is performed in the digital domain, making what is basically an ambience synthesizer also an excellent buy for home video surround-sound use. Doesn't quite reach Class A for Dolby sound, a rather brash, "transitory" coloration being noticeable. Unique in being able to correct for tape-azimuth errors. (Vol.12 Nos.1 & 8)

Lexicon CP-2 surround-sound processor: $895
Less well-featured version of the CP-1, that keeps the all-digital processing of the Dolby surround information and the auto-balancing circuit. (Vol.12 No.12)

Deletions
NEC PLD-910 Dolby surround-sound processor no longer distributed in the US; Yamaha DSR-100 Dolby surround-sound processor replaced by $249 DSR-70 Pro yet to be auditioned.

Surround-Sound Synthesizers
A
JVC XPA-1010TN digital acoustics processor: $1200
Differs from other synthesizers in how it distinguishes between the way in which wide soundscapes excite the reverberant field from narrow ones, the result being an enhanced sense of realism to the synthetic space being produced compared, for example, with the Lexicon CP-1. The JVC is "unmatched," said BS, in its ability to give the listener "exactly the kind of ambience" he or she wants, perhaps due to the fact that its synthesis action doesn't duplicate the early reflections already present on all but anechoic recordings. Its artificial ambience thus seems to fit much better with that on the record, thought BS. (Actual model reviewed was the XP-A1000BK, identical apart from being finished in black rather than "titanium."). (Vol.12 No.12)

B
Lexicon CP-1 digital audio environment processor: $1295
Until the JVC came along, the CP-1 was the best-sounding hall simulator BS had heard, but with only three room models. Versatile choice of reverberation parameters, however, although less flexible overall than the Yamaha DSP-3000. Includes a reasonable Dolby
surround decoder which can cope with video tape-azimuth problems. (Vol.12 Nos.1 & 8)

**Yamaha DSP-3000 surround-sound synthesizer:** $1899

Superb remote control; 18-bit D/A converters on main channels; needs full six-speaker system to work at its best; specific Hall models synthesize early reflections only, relying on reverberation already present on recordings to flesh out the illusion. Doesn’t produce quite as believable an illusion of a real acoustic space overall as the Lexicon, felt BS, due to the failure of some of its room models to synthesize ambience. However, some models, the Cathedral and Chamber, are better than the American unit’s equivalents. (Vol.12 No.9)

**C**

**Sony SDP-505ES**

Excellent-sounding and versatile 16-bit digital delay line running at 44.1kHz for rear-channel ambience synthesis extraction. Integral 14Wpc amplifier for rear channels. Front channels do not pass through active circuitry, so veiling of main-system sound is minimal. Superseded by similar $850 SDP-777ES, which adds full remote control and Dolby Pro Logic decoding. (Vol.11 No.3)

**Home Recording Equipment**

*Editor’s Note:* With the exception of the Foster listed below, none of the microphones listed has been formally reviewed. However, Robert Harley, Stereophile’s Consulting Technical Editor, has had extensive experience with many professional models and has compiled most of the thumbnail sketches of each’s sonic signature. Other professional models to look out for on the secondhand market are cardioids from Sony (C37P & C500), Milab, and Calrec (AMS), figure-eight ribs from B&O and Coles, omnis from Schoeps and B&K, and various ribbon mikes from Crown. (tho it is very easy to get a rather colored midband with these latter mikes) The Shure C81 cardioid is also reported to have quite a flat response. Anyone about to undertake serious recording should ignore all “amateur” microphones; as a rule of thumb, you should spend as much, or more, on a good pair of mikes as you do on your recorder.

**A**

**EAR 824M stereo mike preamplifier:** $2600

Extremely neutral, very quiet, all-tube, balanced preamp from Tim de Paravicini, with switchable level controls and 48V phantom power. Used by Water Lily Acoustics and also to make Stereophile’s first commercial recording. (NR)

**EAR “The Mic”:** $3200

Using a single 6DJ8 tube and a fist-sized output transformer, this rectangular-capsule (sourced from Milab), switchable-pattern—omni, cardioid, figure-eight—mike is a little shut-in in the highs, but has extended low frequencies and a midrange that is extremely true to the original sounds. “No trace of edge or glare,” says RH. Easily the best microphone JA or RH has heard. (NR)

**Nakamichi 1000 R-DAT recorder:** $11,000

Easily the most expensive R-DAT machine around, this two-box Nakamichi lives up to its Model 1000 analog cassette predecessor in being perhaps the finest digital recording system available to the amateur recordist. Records digitally at 44.1kHz and 32kHz and from analog at 48kHz. Superb, quiet tape transport, unique fast- spooling mode, and exceptional ergonomics make it a joy to use. Treated as a D/A processor, the sound was not up to such Class A contenders as the Theta DS Pre, being somewhat less transparent, but was musical nonetheless. The Nakamichi 1000 was used to master the Stereophile Test CD. (Vol.12 No.11)

**Panasonic Pro 3500 R-DAT recorder**

One of the best-sounding DAT decks on the market, according to PWM, with MASH oversampling encoders and pretty good analog circuitry. Recent units (with a blue dot on the box) contain a switch that enables digital recording at 44.1kHz, these will copy CDs digitally, also 44.056kHz PCM-F1 tapes played through an Apogee-modified F1 or Sony PCM-601. A bargain, considering it’s widely discounted to below $2900. (NR)

**B**

**AKG C414B/ULS:** $1045

A popular, large-diaphragm condenser mike, the 414’s extended bass and flat frequency response make it ideal for a variety of applications. Switchable polar patterns, variable pad, and selectable LF rolloff add to its versatility. Transformerless TL version costs $1255. (NR)

**AKG The Tube:** $2295

One of the few currently produced tube microphones. Smooth, open, and uncolored, The Tube captures detail without solid-state staidness. (NR)

**AMS (Calrec) Soundfield Mk.1V:** $5850

Having used both Mk.III and Mk.IV versions, JA feels that the highly praised, variable pickup pattern of this stereo/Ambisonic mike is let down by an overall "grayness" and lack of midrange detail, coupled with a slightly hard lower treble. Nevertheless, it’s excellent at capturing a true stereo image with width and depth. 100m of cable adds $140 to price. (NR)

**Neumann U-87**

A perennial mike favorite among recording engineers. Wide, flat response gives it a similar sound to the 414, but with more "reach" in live, stereo milking applications. Used extensively on vocals. (NR)

**Panasonic Pro 255 portable R-DAT recorder**

Very good sound, with the same MASH encoders as the Panasonic 3500. Less flexible, hence lower rating, and lacks digital inputs. Amazingly tiny for what it does—far and away the best-sounding recorder small enough to carry in a coat pocket. Built-in mike preamp, while not the ultimate, is good enough for serious use. (NR)

**Tandberg TD20A SE Open-Reel Tape Recorder**

The best buy in an open-reel deck, this now-discontinued model offered professional-caliber performance at a relatively modest ($1695) price. Better sound than many professional decks, but ergonomics less good than the still-current Revox B77 III. (Vol.7 No.7)

**Telefunken 251**

Classic tube mike with a sweet, warm sound. No longer made, but available in the used market at many times its original price. Smoother HF than the 414 or U-87. (NR)

**C**

**AKG C451EB/CKI:** $495

**Stereophile**, October 1990
AKG C460B/ULS/CK61: $550
Two small-diaphragm condenser mikes with removable cardiod capsules (omnidirectional, hypercardiod, vocal, and shotgun capsules are also available). Sound is very detailed, but the C451/CK1's tonal balance leans toward the thin and bright, and it has significant off-axis peakiness, making it a less-than-ideal choice for realistic two-mike stereo. Good on drums, however. Omnidirectional CK2 capsule is somewhat colored, but a 20Hz resonance provides an attractive emphasis for pedal fundamentals. Same diaphragm as CK1 used in C34 stereo mike, which has similarly bright balance. Newer C460/CK61 said to be much improved. (NR)

Crown SASS-P microphone system: $899
This is a stereo pair of omni PZM microphones in a head-sized foam block that produces ORTF-like natural stereo imaging. Extended bass response, unlike most directional mikes. Weighs only 1 lb, making it very easy to hang from cables or to mount on a tall stand. "One SASS-P unit, one stand, and a Panasonic Pro 255 DAT make a complete but amazingly portable recording system with very satisfying performance," reports PWM. (NR)

Fostex M22RP/S M-S microphone: $1095
Integrated ribbon M-S stereo microphone. While not quite as open at the top as the best capacitor mikes, and possessing a lightweight bass, the M22RP/S captures the original soundfield extremely accurately. Stripped-down version, the M20RP, costs $700. (Vol.11 No.3)

JVC TDV711BK cassette deck: $620
AG reports that this three-head deck marries an excellent transport to fundamentally excellent sound quality, particularly when Dolby noise reduction is switched out of circuit. (Vol.11 No.11, "Pure Gold")

NAD 6300 cassette deck: $899 ★
Remote-control three-head deck offers effective play-trim control for restoring the HF on tapes made with machines having offset azimuth. Sound smooth, with slight loss of detail set against a freedom from hardness. (Vol.10 No.6)

Revox B-215-S cassette deck: $2900 ★
Automatic bias adjustment, superb transport. According to JGH, "A superb cassette recorder, for the person who wants and is willing to pay for the best quality cassettes have to offer." AHC emphatically disagrees. The latest Nakamichis, with their automatic play-azimuth adjust, probably get a slight bit more off prerecorded tapes. Less expensive B-215 ($2300) cosmetically different but otherwise identical in performance. (Vol.8 No.7)

Sony TC-D5M: $750
This decade-old portable will handle metal-particle tape but only offers Dolby-B noise reduction. It is probably still the best location cassette recorder available short of an R-DAT. (NR)

Sony WM-D6C Pro Walkman cassette system: $400 ★
A pocketable stereo recording system of surprising quality and versatility. AG feels that to spend more on a cassette deck would be a waste of money. Less expensive WM-D3 half the size but keeps most of the quality. Higher wow & flutter, however. (Vol.7 No.6, Vol.10 No.6)

TEAC V-970X cassette deck: $800
Excellent dual-capstan, three-head deck with Dolby HX headroom extension and comprehensive noise reduction (dbx, Dolby-B and -C). Somewhat grainy highs keep it from Class C. More expensive R-919X ($830) features bidirectional record and playback but has less good speed stability, noted George Graves. (Vol.11 No.6)

Any cheap Dolby-C cassette deck
Buy the cheapest with the longest manufacturer's warranty; don't expect to get high-end sound quality from it; use it to make tapes for your car or Walkman until it breaks; throw it away; buy another one, advises The Cheapskate in Vol.10 No.9.

Deletions
Sony TC-K730ES cassette deck discontinued; Sony DTC-1000ES R-DAT recorder dropped as 1990-spec DTC-75ES now officially available from US Sony dealers.

Accessories

Adcom ACE-515 AC Enhancer: $180
Effective AC power-line filter with RF and spike suppression, five accessory outlets (3000W capability), and two heavy-duty outlets (1500W). Does not seem to limit current demands of power amplifiers. (Vol.11 No.4)

Archidee TNX turntable stand: $200
Italian open-frame turntable stand that gives a lighter tonal balance with a better-defined bass, when used to support the Linn Sondek LP12, than the Sound Organisation table. (Vol.13 No.9)

Arcici Quad ESL-63 stands: $195/pair ★
Latest and greatest method of getting the Quads to perform as God and Peter Walker intended. Clamps the ESL-63 in a rigid embrace, also raising it an optimal 16° off the ground. (Vol.10 No.1)

Arcici Lead Balloon Turntable Stand: $325
The opposite approach to that of the Sound Organisation table, with lead used to provide mass sufficient that nothing short of an earthquake will disturb the tranquility of the groove/stylus interface. Enthusiastically recommended by DO. A matching light is available for $30. (NR)

Arcici Superstructure: from $150
Versatile, well-made, metal equipment rack system. (NR)

ASC Tube Traps ★
Relatively inexpensive—prices range from $166 to $436 depending on size and style—but remarkably effective room-acoustics treatment. Tube Traps soak up low-to-high bass standing-wave resonances like sponges. (Vol.9 No.3)

Audio Control Industrial SA-3050A Analyzer: $995
Portable (battery-powered) and inexpensive, kHz-octave analyzer with pink-noise source and accurate calibrated microphone. Parallel port can be used with any Centronics-compatible printer to print out real-time response. (Vol.11 No.6, Vol.12 No.3)

Audio Express NoiseTrapper: $269
Available by mail order from Audio Express, this six-outlet line conditioner was felt by RH to offer an improvement over his raw AC outlets. (NR)

Stereophile, October 1990
AudioPrism CD Stoplight: $14.95
Green acrylic paint for coating the edges of CDs. The green color—it absorbs the laser's infrared wavelength—is presumably significant, but at present we have no idea why this tweak should improve the sound of CDs. That it does so, however, seems to be beyond doubt. Martin Colloms reports that a water-based poster pen, the Uniposca from Mitsubishi, has a very similar effect. Martin also notes that the CD should first be degaussified before the green paint is applied. (NR, but see DO's and TJN's WCES reports in Vol.13 No.3 and Sam Tellig's and Robert Harley's feature article on CD tweaks in Vol.13 No.5.)

AudioQuest DM-1000 cartridge demagnetizer: $80
(NR, but similar and more expensive Sumiko Flux-Buster was reviewed in Vol.9 No.4, Vol.10 No.5, Vol.12 No.4)

AudioQuest Sorbothane Feet
The best means of isolating components from vibration. A set of four big feet costs $50, four CD feet $30. (NR)

CD Saver ☆
Eliminates scratches from CDs and LaserVision discs, rendering the unplayable playable. (Vol.10 No.8, Vol.11 No.8, see also Vol.13 No.9, p.11)

Cramolin Contact Cleaner ☆
The right stuff for cleaning up dirty and/or oxidized plugs and contacts. (Vol.10 No.6)

DB Systems DBP-10 Protractor: $30 ☆
Fiddly but accurate guide for setting cartridge tangency. JA's and JGH's preferred alignment protractor. (NR)

Distech Powerbridge I & II AC cords: $120—$200
LL reports that these AC cords produce an audible difference with amps and preamps, but whether this difference represents an improvement or not is very much component-dependent. (Vol.11 No.4)

Inouye Synergistic Power Line Conditioner: $525
Expensive, dual-channel AC line conditioner, with sophisticated filtering and spike protection and four AC outlets, cleans up the sound from CD players, reported JA, but had variable effects with preamps and amplifiers. (Vol.12 No.3)

The Listening Room: $29.95
Inexpensive but excellent computer program for PCs from Sitting Duck Software, PO. Box 130, Veneta, OR 97487, that allows an audiophile to move simulated loudspeakers and simulated listening seat around a simulation of his or her room (in three dimensions) in order to find the position giving optimum performance below 200Hz or so. (Review in progress)

Meitner Translinks: $325/pair
Signal transformers with a 1:1 ratio, these isolate the preamp ground from that of the power amplifier. In the context of the Meitner preamp/power amp combination, these seem to improve low-level dynamic performance. Must be driven by a source impedance of 100 ohms or less. (Vol.11 No.6)

Merrill Stable Table turntable stand: $1047
Exotic wood finishes add $100 to price; granite top adds $60; an appropriate amount of lead shot will cost around $100. (Vol.12 No.10)

Mobile Fidelity Geo-Tape: $15 ☆
A valuable test and shopping aid for cassette decks. (Vol.8 No.5)

Nestorovic Labs Moving-Coil Cartridge Network: $300
An "Audiophile" version is available for an extra $250. (Vol.13 No.9)

Phantom Acoustics Shadow active LF acoustic control (RH): $2500/pair
The first instance of active noise-control techniques being used to modify listening-room acoustics. Robert Harley reports that these tall, corner-placement cylinders do a fair job of minimizing low-frequency standing-wave problems. (Vol.12 No.12)

RPG Diffusors
The first effective method of adding diffusive surfaces to a listening room, these remarkably effective panels join Sonex foam and Tube Traps in helping to tame the far-off unattractive—room acoustics. RPG Diffusor Systems Inc. offers a complete room-treatment system, called the "RPG Home Concert Hall," available in almost any finish and size to enable audiophiles to get optimum performance from all types of loudspeakers. (Vol.11 No.4)

Signet SK-302 Contact Cleaner Kit: $25 ☆
Contains abrasive plastic tools for effective inner cleaning of phono plugs and sockets in combination with Cramolin. The RCA phono plug and socket cleaners alone cost $10. (Vol.10 No.6)

Sims Navcom Silencers: $68/four
Robert Deutsch finds these dampening feet to provide superior isolation to Mission's Isoplat. (NR)

SOTA & Goldmund record clamps ☆
Though these clamps have somewhat different sounds, they are the best record-clamping devices on the market. They can both improve top- and bottom-end extension and reduce resonances on any 'table, including those employing vacuum clamping systems. Well worth their cost in a high-resolution system. The SOTA Series II Reflex clamp ($135) gives a somewhat richer, warmer sound and is more effective against upper-midrange and lower-treble resonances. The $125 Goldmund shapes up a flabby midrange and controls the more serious lower-treble/upper-midrange problems.

Sound Organisation Turntable Stand: $150
The mandatory ancillary to the Linn turntable, though, as with the more expensive RATA stand, its low height may prove bothersome in a listening room that has to be shared with cats and children. (A taller version is now available.) (NR)

StyLast Stylus Treatment ☆
StyLast won't make a difference every time you put it on, but it will help provide smoother high-end sound, and is claimed to extend stylus and cantilever life. (NR)

Sumiko Fluxbuster: $250 ☆
Excellent cartridge demagnetiser, though more expensive than new AudioQuest model. Recent availability at a discounted price suggests that it is being phased out. Be sure to remove the stylus assembly when using any of these devices to demagnetize a moving-magnet cartridge. (Vol.9 No.4, Vol.10 No.5, Vol.12 No.4)

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Stereophile, October 1990
**Sumiko Tweek Contact Cleaner: $18 ★**
This contact enhancer for use on plugs and terminals actually does improve the cleanliness and resolution of the sound of an already excellent system. Keeps freshly made contacts fresh. (Vol.10 No.6)

**Sumiko Reference Band: $17.95/dozen**
Molded, non-adhesive band that fits around the periphery of a CD to produce much the same aural benefit as CD Stoplight. (NR, but see the Audio Anarchist’s column in Vol.13 No.9)

**Target equipment racks: $150–$300**
Finished in basic black, these useful but inexpensive racks feature rectangular steel-tube construction, with price depending on height and number of shelves. Spiked feet supplied, with top shelf resting on upsprung, adjustable spikes to optimize it for turntable use. Target’s wall-mounting turntable shelf possibly the best way of siting your turntable out of harm’s way. (NR)

**Tice Power Block/Titan: $1250/$1000**
Superb if expensive AC conditioning system. (Vol.13 No.4)

**Tiptoes ★**
The Mod Squad’s greatest invention. The least expensive way of improving the bass and midrange definition of virtually any loudspeaker.

**Watkins Echo-Muffs: $199/pair ★**
Effective means of reducing amplitude above 200Hz of early reflections of loudspeaker from nearby surfaces, thus improving imaging. Whether or not the aesthetics will be domestically acceptable will be up to personal taste. (Factory-direct only.) (Vol.10 No.4)

**WBT RCA plugs ★**
The best, although original steel locking collet, now replaced by brass, gave rise to neurosis. (NR, but see “Industry Update,” Vol.12 No.9)

**Good Speaker Stands**
There are too many possibilities, but, briefly, a good stand will have the following characteristics: good rigidity; spikes on which to rest the speaker, or some secure clamping mechanism; the availability of spikes at the base for use on wooden floors; if the stand is steel, provision to keep speaker cables away from the stand, to avoid magnetic interaction; and the correct height, when combined with your particular speakers (correct height can be anything from what you like best to the manufacturer’s design height for best drive-unit integration). Though Stereophile has neglected to review speaker stands, it doesn’t mean we think them unimportant—for speakers that need stands, every dollar spent on good stands is worth $5 when it comes to sound quality. Brands we have found to offer excellent performance are Chicago Speaker Stand, Arcici Rigid Riser, Celestion SLSi, Target, Heybrook, and Linn.

**K**
Tripplite line conditioners.

**Deletions**
Monster Cable/Euphonic Technology/Sims/AudioQuest CD rings on the grounds that the Sumiko Reference band does a similar job at a similar price without having to be stuck to the CD’s surface.

**Headphones & headphone accessories**

**Stax SR-Lambda Signature: $2000**
A diaphragm one-third thinner (1 μm) than the Lambda Pro, and a drive amplifier (SRM-T1) with a tube output stage distinguish what BS termed “the best headphones around” in his review. As good as the Pros are, the Signatures better them in terms of air and space around instruments, having a more forward midrange and less, if you can believe it, of a “mechanical” quality. (Vol.11 No.8)

**Stax Lambda Pro 3: $1200 ★**
The latest version of the flagship Stax headphones, supplied with a dedicated class-A solid-state amplifier, the SRM-1 Mk.II, the Pro 3 features a totally transparent sound with, according to BS, “bodiless” detail. Unlike most ‘phones, the listener gets a true idea of the surrounding ambience on a recording. Balance is laid-back and bass is a bit fat, not quite blending with the rest of the range, but distortion levels are astonishingly low, and the Pros have a remarkable dynamic-range capability. As delivered, the Lambda suffers from upper-midrange suckout, which becomes less bothersome after some hours’ use. Very comfortable. (Vol.7 No.5, Vol.10 No.9; see also headphone review in Vol.12 No.4)

**Stax ED-1 diffuse-field headphone equalizer: $800**
Equalizes headphone sound to compensate for the fact that headphones fire the sound straight into the listener’s ears, whereas in real life the sound has to negotiate the audio obstacle course represented by the listener’s head and outer ear. “The entire audible spectrum sounds more coherent and seamless,” quoth BS. (Vol.12 No.4)

B

**Stax SR-5 NB: $350**
More colored in the midband and above than the Stax SR-34 or Signet models, and balanced a little on the bright side, the ‘5 scores when it comes to reproduction of low frequencies and overall transparency. (Vol.10 No.9)

C

**Beyerdynamic DT990: $210**
One of the two best dynamic headphones on the market. (The other is the Sennheiser HD540.) A less detailed sound than the electrostatic models and a slightly bass-shy, midrange-forward balance preclude a Class B rating. For $50 more, the DT990/Pro features a neutral balance and extended low frequencies, raising the performance to borderline Class B. (Vol.10 No.9)

**Sennheiser HD540 Reference: $199**
One of the two best dynamic headphones on the market. Slightly less neutral than the Beyer DT990, being more laid-back with a “wispy,” even bright, high end. The new HD560 has a more musical balance, lacking the ’40’s top-octave brightness. (Vol.10 No.9)

D

**Beyerdynamic DT320 Mk.II headphones: $83**
Transparent sound, with reasonable LF extension. Some listeners may find its balance too bright, however. (Vol.12 No.4)

**Sony MDR-282 Turbo ★**
Best of the in-the-ear cans, with LC-OFC wiring, excel-
lent bass response, and a relatively uncolored treble, despite a somewhat overbright balance. Latest E484 version ($40) said to be slightly better. (NR, but see headphone review in Vol.12 No.4.)

Sony MDR-CD6: $120
A little expensive for the sound quality offered—too much midbass, sound somewhat un subsets—but recommended on the grounds that BS feels these to be the ideal cans for location recording, due to their high sensitivity and good isolation. (Vol.10 No.9)

Sony MDR-S101 Mk.II: $30
A light balance with a lively, open sound, but free from coloration and distortion. A bargain! Mk.II version features gold-plated jacks. (Vol.10 No.9)

K

Record-Care Products

A
LAST record-preservation treatment ☆
This actually works. It significantly improves the sound of even new records and is claimed to make them last longer, though we haven’t used it long enough to verify the claim. (Vol.5 No.3)

Nitty Gritty Mini Pro 2 record cleaner: $700 ☆
This semiautomatic wet cleaner cleans both disc sides at once. Slightly less rugged than the VPI, but both do an excellent job and the Nitty Gritty Pro II is faster. Significantly better design than earlier Nitty Gritties. You may be surprised that the main sonic effect of cleaning LPs is not primarily a reduction in surface noise but a cleaning up of midrange sound. (Vol.8 No.1)

Nitty Gritty 2.5FI record cleaner: $500 ☆
Instead of a vacuuming tonearm as on the professional Keith Monks machine, the NG cleaner uses a vacuum slot. Cleaning is efficient and as good as Nitty Gritty’s Pro, at a significantly lower price, though it takes twice as long, cleaning each side of an LP in turn. (Vol.7 No.5, Vol.8 No.1)

Nitty Gritty Hybrid 2 Record/CD cleaning machine: $610
Basically a Nitty Gritty 2.5FI with an adapter that allows CDs to be buffed clean in a non-tangential manner. (Vol.12 No.3)

Rozoll Gruv-Glide ☆
Record dust-removing agent that also leads to better sound. Apparently doesn’t leave a film or grunge-up the stylus. (Vol.9 No.8)

VPI HW-17 record cleaner: $700 ☆
Clearly an industrial-quality machine of reassuring quality, the VPI does one side at a time, semiautomatically, and is slower than the Nitty Gritty: “A highly functional and convenient luxury.” Latest version has a heavier-duty vacuum system. (Vol.8 No.1)

B
VPI HW-16.5 record cleaner: $450 ☆
Manually operated version of HW-17 (above), noisy motor; less money. Adjusts automatically to thickness of record. (Vol.5 No.7 & 9, review was of earlier but substantially identical HW-16.)

D
Decca, Hunt-EDA, Goldring, or Statibrush record brush ☆
Properly used (held with the bristles at a low angle against the approach grooves and slowly slid off the record), these are the most effective dry record cleaners available. (GH strongly disagrees, feeling that they leave the dust on the record.) No substitute for an occasional wet wash. (Vol.10 No.8)

DiscWasher record brush ★
If you don’t have a cleaning machine, the DW system will do an adequate job on relatively clean records, but won’t get out the deep grunde. If you begin to accumulate lots of gunk on your stylus after cleaning your record with an older DW brush, the bristles are worn out; send it back for resurfacing or buy a new one. A high-torque turntable is required. (NR)

Loudspeaker Cables & Interconnects

Editor’s Note: Previous “Recommended Components” listings for speaker cables and interconnects were mainly derived from Dick Olsher’s surveys in Vol.10 No.2 (March 1987) and Vol.11 No.7 (July 1988). As many, perhaps nearly all, of the models recommended have changed to a greater or lesser degree since those reviews appeared, we decided for this issue to list those cables that members of the magazine’s review team either have chosen to use on a long-term basis or have found to offer good value for money. They are therefore implicitly recommended. Where a cable has been found to have specific matching requirements or an identifiable sonic signature, these are noted in the text.

Bear in mind that, to a far greater degree than with any other component, the sound of cables depends on the system in which they are used. Before parting with possibly large sums of money for a cable, it is essential to audition it in your own system. “Drinking by the label” is always a bad thing to do in hi-fi, but it is both unforgivable and unwise when it comes to speaker-cable purchases. In addition, in JA’s opinion, the virtues offered by the most expensive cable may well only be audible in the context of a topflight, very expensive system. What is the “best” in absolute terms is not, therefore, necessarily the best for your system.

Arniss Balgalvis points out that mixing’n’matching interconnects and speaker cables is a well-worn route to sonic disappointment. Always use interconnects and speaker cables from the same manufacturers, is his advice. Peter Mitchell strongly makes the point that less is more when it comes to speaker cable, recommending that a mono power amplifier be placed as close as possible to the speaker it drives. This does pass the buck, however, to the preamplifier, which must then be capable of driving long lengths of interconnect. Peter uses Canare Star Quad microphone cable for interconnect.

Sam Tellig, the Audio Anarchist, and his associate Lars have been impressed by a recommendation for speaker cable from Dave Magnan, the maker of Magnan Series V interconnect: specially prepared Mogami Neglex 2477, which retails for under $1.50/foot. (A double run is required, which brings the cost up to just under $3/foot.)

Stereophile, October 1990
Sam writes: “Cut off about 6” of the black outer sheath, exposing the outer wires, the shield. Peel back this wire—beautiful oxygen-free copper—and twirl it together. Now cut off about 3” of the inner sheath, exposing the inner wire. Wrap some electrical tape around the bottom 3” of the outer shield. It’s important to leave about 3” of the center sheath intact to help prevent the wire from shorting out when you do what I’m going to describe next.

"Do what I just said with two runs of the Mogami. Now, carefully combine the inner core of one run with the outer shield of another, making sure that the words ‘Mogami Neglex’ run the same way on both outer sheaths, because this stuff is highly directional. The word ‘Neglex’ should face the power amp; in other words, the words on the sheath should run toward the speakers. Crimp on some spade lugs and tape over any exposed wire.

“...the problem with the Mogami, aside from the pain in the butt of preparing it, is that the bottom end is not so good. So here’s a cable you can perhaps use if your system has too much bass: a tone control, if you will.”

**Interconnects**

**AudioQuest Lapis Hyperlitz:** $400 1m/pair terminated with RCA plugs

Tonally, the latest version of Lapis seems to fall midway between the “mellow” cables—MIT, Monster—and those that are rather upfront in the treble, such as Madrigal HPC. JA feels, however, that its outstanding virtue is a lack of grain that allows correct instrumental textures to flow freely; and a deep, well-defined soundstage to develop.

**Cardas Hexlink-5:** $500 1m/pair terminated with RCA plugs

A Dick Olsher and Guy Lemco e fave rave.

**Esoteric Audio Enamel Litz CD interconnect:** $65 (Tech 2), $35 (Superlink) 0.9m/pair terminated with RCA plugs

Don Scott recommends this interconnect—“after it has been seasoned for about a month”—for “taking the nasties out of often gritty FM.” He does mention, however, that it is not the optimum choice for overall transparency.

**Expressive Technologies IC-1:** $415 1m/pair terminated with RCA plugs

Robert Harley is currently using samples of this interconnect, with positive results. “Despite the fact that these cables are bigger around than a garden hose, ridiculously bulky, unwieldy, and stiff, the musical rewards they offer are well worth the trouble.”

**Jerrold RG-6**

Don Scott fits this inexpensive generic cable with Radio Shack plastic-shell RCA plugs, modified to fit the wire diameter, and feels that the result is remarkably uncolored.

**Kimber KCAG:** $350 1m/pair terminated with RCA plugs

Unshielded but astonishingly transparent.

**Kimber KC1:** $68 1m/pair terminated with RCA plugs

Krell Cogelco interconnect: $610 1m/pair terminated with RCA plugs

$510 1m/balanced pair terminated with XLR plugs

Arnis Balgalvis recommends this Krell-distributed interconnect for use with Krell electronics. In combination with Krell’s The Path speaker cable, he finds that the sound “is very transparent and balanced, with detail galore.”

**Magni Type VI:** $595 4/pair terminated with RCA plugs

Preliminary auditioning by Robert Harley suggests that this one is a winner.

**Monster Cable Sigma:** $750 1m/pair terminated with RCA plugs

Used by both Larry Greenhill and Arnis Balgalvis, the latter characterizes the Sigma interconnect, when used with Classe and Rowland electronics, as giving low frequencies “proper weight and extension, the overall sound being very open and detailed.” The Sigma cables also “throw a soundstage of vast proportion, the results being alive and musically involving.” With Krell amplification, however, Arnie notes that the “sound gets too dark” with Monster Sigma, and “loses sparkle and glow.”

**Siltech 4-2-4:** $360/first meter w/RCAs, $280/additional meter or unterminated

Astounding transparency and imaging, feels JA. Distributed by SOTA.

**Straight Wire Maestro:** $272 1m/pair terminated with RCA plugs

Less laid-back than AudioQuest Lapis, with superb presentation of detail.

**TARA Labs Space & Time Pandora:** $295 1m/pair terminated with RCA plugs

van den Hul D-102 Mk.II: $110 1m/pair terminated with RCA plugs

Excellent treble but less good image focus.

**Loudspeaker Cables**

**AudioQuest FI4:** 79¢/ft

Inexpensive flat-twin solid-core cable that Robert Harley enthusiastically recommends.

**AudioQuest Clear Hyperlitz:** $1095 10’ pair terminated

Very expensive but solid bass reproduction with a clear (but), open midband and treble. Can sound rather lightweight in some systems, but almost defines the term “neutrality,” feels JA. Uses “6N”-pure copper bundles in a complex lay that brings every conductor to the surface to the same extent.

**Cardas Hexlink-5:** $800 10’ pair terminated

Kimber 4AG: $100/ft

A very expensive hyper-pure silver cable that resides in Larry Archibald’s and Dick Olsher’s systems and can offer a glimpse of audio heaven. Significant system sensitivity, points out DO, so be sure to check for compatibility before you buy.

**Kimber Kable 8TC:** $7.80/ft

A double run of 8TC greatly improves the sound, feels DO. Excellent bass.

**Kimber 4TC:** $4.40/ft

**Kimber 4PR:** $1/ft

Least expensive cable from Kimber was found to have

Stereophile, October 1990
The Cary Audio Design CAD-5500 compact disc audio processor is a revolutionary design analog audio control center for high-end stereo and video systems. The CAD-5500's primary purpose is processing the analog audio output signal from a compact disc player and is used in conjunction with basic or mono-bloc amplifiers (e.g., The Cary Audio Design line of basic power amplifiers.) The Cary Audio C.D. Processor provides the audiophile with a method to "tame" extremely bright, harsh, edgy and often unpleasant sounds emanating from the many digital audio playback systems. Cary Audio Design's unique method of audio signal processing is called "Reverse Phase Cancelling" RPC™.
good bass, but a "zippy" treble and poor soundstage, according to DO. With inexpensive amplifiers, however, its good RF rejection compared with zipcord or spaced-pair types will often result in a better sound.

**Krell The Path: $680 10' pair terminated**
Works optimally with Krell amplification, the result being, according to AB, "more heft and a gratifying glow around the performers."

**Monster Cable Sigma: $1000 12' pair terminated**
See AB's remarks regarding Monster's Sigma interconnect.

**Naim NAC5: $8.60/m**
Inexpensive cable that the Audio Anarchist found to work well with the Spendor S-100 loudspeaker. Worth investigating as a good-value cable, thinks JA.

**Radio Shack 18-gauge solid-core hookup wire:**
$11/ft
Ridiculously cheap way of connecting speakers, yet Sam Tellig reports that this cable is OK sonically. You have to choose for yourself whether to space or twist a pair for best sound (or even whether to double up the runs for less series impedance).

**TARA Labs Space & Time Phase II TFA Return:**
$195 10' pair terminated
Guy Lemcoe's preferred speaker cable.

**TARA Labs Space & Time Phase II cable:**
$6.95/foot
Featuring twisted solid-core construction and "Australian copper," this inexpensive cable is Dick Olsher's workhorse speaker cable.

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SIGNET SL280 LOUDSPEAKER

Thomas J. Norton


Audio journalists tend to wander the corridors of a CES in a minor state of shell-shock. There are no carnival-barkers outside the rooms enticing one to enter (not yet, at any rate), but the sounds and reputations oozing from the open doorways yield little to the "hurry, hurry, hurry" crowd. The Signet room has always, it seems, been one of the quieter oases, often eschewing sound altogether while contentedly displaying their phono cartridges, cables, and various accessories. On a recent CES hunt, I was therefore intrigued to find them demonstrating two new loudspeakers, of all things, to the milling throngs.

Well, they weren't really throngs. The loudspeakers in question were not exactly the sort that draws a crowd. Simple, two-way designs in nicely finished, but apparently conventional, wood cabinets. Stand-mounted. Very much like the endless parade of econoboxes, many of them British, that come and go. Ho hum. Don't ask me why I stayed to listen. But I'm glad I did. The setup did not guarantee that the Signets would sound their best, but what I did hear convinced me somehow that these were products worthy of attention. Two words graced my copy of Signet's literature: "Must Review."

As in many such instances, the best of intentions got lost in the rush of multiple moves and more complex, glamorous products competing for attention. But when I ran across the Signet again at Stereophile's 1990 New York High End Hi-Fi Show, I promised myself that their SL280 would be one of the first products I'd evaluate when I got settled in from my move to Santa Fe from Los Angeles.

The eventual arrival and unpacking of the Signets proved uneventful, including the accompanying visit of Gary Post and M. Andrew Lewis of Signet. Andy Lewis, formerly with AR, is the designer of the Signet loudspeakers and the Manager of Loudspeaker Development for the company. He had brought along a few spare drivers just in case, but they weren't needed.
Design
There's really not a lot to discuss here. The Signet SL280 is, on the surface, a straightforward design. Both the 1" dome tweeter and the 8" polypropylene-coned woofer appear to be sourced from SEAS. The cabinet is rigidly braced—one internal brace located above the woofer, another below. The bracing is said to be asymmetrical to spread out the frequencies at which the cabinet panels vibrate, minimizing resonances. The philosophy at work here is the minimization of energy storage and its rapid dissipation. A knuckle-rap test revealed a well-damped sound, but not one as dead as in those cabinets which emphasize maximum density—a technique which, according to Signet's literature, increases energy storage and dissipates it slowly, causing time-based smearing of the sound. Internal reflections are controlled by a section of U-shaped acoustical foam behind the woofer.

The drivers are mounted on the baffle in close proximity to each other; the woofer basket actually overlaps the tweeter flange—which is apparently the reason that the woofer frame is not rebated into the baffle. Acoustic foam having a unique daisy-petal-shaped cutout (to spread out, in time, the inevitable, remaining diffraction), surrounds the tweeter. The latter has its aluminum dome mounted in a soft polyamide surround. The magnesium-framed, rubber-surround woofer incorporates a feature called "Dynamic Damping." The latter consists of a shorted turn on each end of the voice-coil, said to improve low-bass transient behavior, acting as electromagnetic "shock-absorbers" to prevent the voice-coil from bottoming under heavy stress. Woofer loading is third-order, with a rear-mounted port. (The description in Signet's literature would seem to indicate a Quasi Third-Order Butterworth alignment, since both the woofer's natural resonance and the vent resonance are below the system's -3dB point.)

The crossover network has been designed using the latest computer optimization techniques, followed up by measurement and extensive listening. Air-core inductors and polypropylene capacitors are used, along with oxygen-free copper internal wiring. Two pairs of gold-plated binding posts are provided configured for bi-wiring (jumpers permit the use of one pair of cables, if desired). These binding posts provided my only source of frustration with the SL280s—after only a few cycles of connecting and disconnecting, several of them stripped at a point just short of permitting tight fastening of spade-lug connectors. They cinched tight enough to provide uninterupted contact, but short of the point of a solid, reassuring grip. The layout of the bi-wire terminals was as, is all too common, a bit too closely spaced to permit ease of use with heavy speaker cables, though I was able to connect LiveWire Clear with only minor difficulty.

All sides of the SL280 are covered in oak veneer, save the front, which is a matte black. The optional stands were wood with integral spikes; I filled the hollow pedestals during the course of the review with clean, dry sand. The stands were reasonably sturdy—though not quite as flex-free as good metal supports. They were better-looking than your typical steel-framed stand, although the grain (and stain) on the pedestal did not match that on the loudspeakers. Signet indicated to me that the stand may be changed to an all-black finish in the near future. Wire clips are provided on the rear of the stands to dress the loudspeaker cables, although they were too small to be of use with audiophile-grade garden hoses.

Room
This is the first equipment review I have done in Stereophile's updated dedicated listening room. First, however, a word or two about what this room is and is not. It is not the location where all of Stereophile's listening tests are done. Practically all of our reviewers do their listening in their own homes. When I arrived in Santa Fe, only DO used the Stereophile listening room. RH had also used it temporarily last year when he was waiting for his new home, with its dedicated listening room, to be completed. Since it appeared that I would be faced with the same arrangement for at least several months, I set to work on a project to make the room suitable for sharing with minimum inconvenience. I'll have more to say about the updates in a future article (experimentation is planned with various absorptive and diffusive materials over the coming months, and the results might be helpful to others—although

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1 Makers of such systems will, of course, disagree, and the whole subject is considerably more complex than can be dealt with here.

2 The only place I have seen a similar technique used is in the Duntech loudspeakers—where the damping material is, I believe, felt.

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this is not as yet certain, by any means).

As presently constituted, the listening room measures about 15' by 20' by 9'. The ceiling is of a classical Santa Fe style—heavy shaved wooden log beams supporting the main wood (pine) ceiling planks. The beams reduce the height of portions of the ceiling to 8', and provide better dispersion than an ordinary, flat structure. The speakers are placed on the short wall. A large, multi-paned window on the wall behind them is scheduled to be covered with heavy draw-drapes, though it is at present au naturel. The wall behind the listening position (just under 4' behind, at present) is covered with 64 square feet of 4' thick Distech acoustic foam. Nine medium-sized decorative fiberglass panels (formerly Monster Cable Imagers) have been hung in strategic locations about the room—eliminating the need for the heavy fiberglass damping behind the loudspeakers which was used in DO's recent Apogee Stage review. Four 16" Tube Traps have also been added to the room since that review, in the corners behind the loudspeakers. Two of the room walls (the outside walls) are of plastered adobe; the inside walls are light plaster over wallboard. A fireplace opening one corner behind the loudspeakers has been filled with several sheets of Sonex absorptive foam, and the Tube Trap in that corner placed directly in front of it. The room's nearly wall-to-wall carpet is a medium-weight closed-pile Berber with an artificial jute pad on a suspended wood floor.

The room, as presently constituted, "sounds" surprisingly good. It is of average liveness (it was deader before the alterations). I do not doubt that the room was a least partly responsible for my favorable impressions of the Signet loudspeakers. But that's only fair. Would you want us reporting on how they sound in a bad room?

Sound

The Signets were auditioned with a variety of associated equipment. Program sources included the Koetsu Rosewood Pro IV cartridge in a Graham tonearm mounted on the Aura turntable, and several CD players, including the California Audio Laboratories Aria Mk.III and the NAD 5000, but primary CD playback was via the latter's digital output into the Esoteric D-2 processor (coaxial connectors—the link chosen in this case being a garden variety, 75 ohm video interconnect). The preamplifier was, in all cases, the Consonance from the Jeff Rowland Design Group. Power amps included the Rowland Model 1, Classé DR-8, and Kine- getics KBA 75. Interconnects were Kimber KCAG (tonearm to preamp), AudioQuest Lapis (CD player to preamp), and Cardas Hexlink from the preamp to the power amp. Loudspeaker cable was AudioQuest Clear. The amplifiers were placed between the loudspeakers, which called for a long (25') interconnect and relatively short (7') loudspeaker cable. Since bi-wire terminals are provided on the Signets, all evaluations were carried out in the bi-wire mode.

If I state right off that the musical enjoyment I have received from listening to the SL280s has been a delightful surprise, I risk straining your credulity. After all, this is only a simple, two-way box loudspeaker. It is, by high-end standards, modestly priced. And it comes from Signet, a respected name in phono cartridges, but one with no track record in loudspeaker design. Unless one counts the SL-100 of a few years back: an odd, three-way design using two tweeters firing backwards into some sort of a reflective lens. Signet distributed some interesting technical information about this loudspeaker at the time of its introduction, but to my knowledge the design was less than a raging success in the marketplace. No, Signet has not been, to this point, a name to conjure with in the loudspeaker business.

But designer Andy Lewis's brainchild is nothing less than the most pleasant surprise that this reviewer has come across in a loudspeaker since the Epos ES-14. Now don't get me wrong. Since moving to Santa Fe I've listened to a number of high-end loudspeaker systems—Apogee Stages, Avalon Eclipses, Ensemble References, and others still waiting their turn in the reviewing line. Many of them can easily outpoint the Signets in certain areas—the majestic authority of the Stages or the precise midrange inner detailing of the Ensembles, to name but two. But they all cost considerably more than the SL280. What the latter does, and does convincingly for this reviewer, is skillfully juggle the inevitable compromises required in a fairly small, moderately priced two-way loudspeaker to come up with a resulting mix which is musically satisfying on a wide range of program material ranging from the most subtle, small-scaled works to the gran-
deur and impact of full-blown orchestra and chorus.

Before I tell you what the Signets will do, however, a few words on what I feel they will not do. Or, rather, those areas where you may find their performance less than captivating. The list is short. First, the lowest octave or so of bass is not there. No surprise, really. The first designer who comes up with a loudspeaker of this size or smaller which has substantially flat output—at real-world listening levels—from 10Hz to 40Hz can place his or her order for that Lamborghini Diablo. And throw in a little beachfront spread in Malibu. Second, the midrange of the Signet appears to be a bit "slow" compared with the mids of, say, a good three-way or a top-class (and decidedly more expensive) minimonitor. Just a slight degree of homogenization—or a thin haze and less than you-are-there transparency, if you will—gently reminds you that you're listening to a pair of loudspeakers. A degree of subjective forwardness or "shout" to the response in the same region—particularly evident on program material itself not entirely neutral in this area—contributes to the proceedings. These midrange limitations become more evident as the sound pressure levels increase and the program material becomes more complex.

But the Signet's low-end limitations are not severe. This is definitely not an entry in the "lean and mean" sweepstakes. Nor do the midrange qualities lack redeeming features. Coloration was very low; l was able to pin down no consistent pattern of obvious boxiness, nasality, or other midrange nasties. And with a careful match of amplification (about which more anon), the midrange displayed a life and clarity, particularly at low and moderate listening levels, which provided a more than convincing illusion of reality. This clarity was in no way hurt by the SL280's impressive dynamic capability throughout the audio band.

But to return to Chapter 1: I initially set up the Signets on their dedicated stands 6-7' out from the short wall of the listening room, 3-4' from the sidewalls. The height of the stand plus the loudspeaker placed the listening axis roughly level with the center of the woofer, with the tweeters then a few inches above ear-level. The speakers were toed-in and aimed at the listening position. The grilles were removed for all of the sessions. The first amplifier in the ring was the Rowland Model 1 (prior to an update which had not been incorporated as of this evaluation). The result was striking. "This is wonderful," my listening notes read—"a real soundstage." The image was solidly defined within the bounds of the loudspeakers (though not beyond them). Highs were detailed yet clean and unobtrusive. The Atrée Sampler (Atrée E 7699) was the program material, and this recording's delicate, detailed, and very un-digital-like highs were silky and sweet through the Signets. The loudspeakers simply refused to call attention to themselves, yet the reproduction was in no wav dulled or bland. A natural shade of warmth—definitely not overdone—avoided any hint of analytic sterility. I did notice that somewhat forward quality, but as long as the volume was kept to a level appropriate to the music, it simply added a bit of life to the sound and did not intrude. On band 6, Hopkinson Smith's lute was sublimely natural. The artist could be clearly heard breathing on this selection, yet this non-musical bonus never sounded out of place or competed with the instrument for attention. It merely added to the realism of the event—of a flesh-and-blood artist performing in a real space. The harpsichord on track 7 was fully detailed, accompanied by an unmuddied sense of appropriate weight. The very lowest organ notes on track 8 were not there, but I was never left with the feeling that the instrument lacked body or was threadbare. Organ reproduction was highly satisfying, though not gut-wrenching. Only as the sonic fabric on this disc became complex did I become aware of that subtle obscuration of midrange detail—of a thin scrim, if you will, between the loudspeaker and the listener. But this was not an effect which caused me any great concern. I was simply enjoying myself too much.

And I did not become disaffected with extended listening. The timbre and presence of Radka Toneff's voice on Fairy Tales (Odin CD-03) were palpable and heart-stopping, the accompanying piano warm and sweet. Her vocal inflections were vividly conveyed, and there was no feeling of veiling on this simple, intimate recording. There was a real sense of three-dimensionality on Misa Criolla (Philips 420 955-2), with the soloist (José Carreras) set slightly back at stage center, the chorus spread around and behind him, and various instrumental highlights firmly located in width and depth across the space between the loud-

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speakers. And although the image did not extend beyond the loudspeakers themselves, I never had the feeling that the soundstage was constrained or miniaturized by the Signets. It was, in fact, broad and expansive, the SL280s doing a convincing disappearing act.

I did occasionally feel that the Signets were a trace too sweet and laid-back (in a dynamic, not a spectral sense) with the Rowland amplifier. A sweet, almost tube-like quality has been attributed in the past to Rowland amps—although, judging from the results, the combination is not at all as bizarre as it would seem. My first alternative was not much of a step down in price—the $2395 Classé DR-8. My experience up to that time with the Classé had indicated that it is a livelier, more upfront-sounding amplifier than the Rowland, although less silky-sweet and refined. Both amplifiers are of quite modest power—60Wpc/8 ohms for the Rowland, 70Wpc/8 ohms for the Classé—but both have excellent current capability and drive difficult loads well. (Although the Signets are of moderate efficiency and do not appear to be demanding of amplifier low-impedance grunt-power.)

The resulting change was not a surprise. There was less warmth with the Classé, though the sound was not unduly leaned-out. Inner clarity did appear to be tightened-up somewhat, at the expense of a somewhat more obvious top-end. The differences between the lone analog-mastered cut on Fairy Tales ("My Funny Valentine") and the rest of the album (a somewhat greater ambience and a more natural quality to the analog) became more obvious. Midrange clarity on the Astrée sampler was also enhanced, though the sound did turn a bit analytical. It was very definitely not overbright or etched, and the increased HF energy was appealing on music that depended more on dynamics and incisiveness than on subtlety to make its point. Low frequencies were also noticeably tighter.

To this point most of my listening to the Signets had been via CD. This was simply because my own, familiar, analog setup (not to mention most of my LPs) was still in the storage mode from my recent move. But the listening room had just undergone a new addition to its currently resident Aura turntable—the Graham tonearm and Koetsu Rosewood Pro IV cartridge. The latter, alas, was Bob Graham's personal sample and only in our possession for a week. So while it may seem doubly bizarre to use a $3500 cartridge in an even more expensive turntable-tonearm combination with the Signets, I couldn't resist. The result was rather stunning—despite my past and continuing reservations on super-high-priced cartridges.

Vocal reproduction was vibrant, full-bodied, and "there." Imaging and depth were arrestingly good, midrange coloration no factor. The round yet detailed HF response of the Koetsu rendered the slight brightness of the Classé irrelevant. Some warmth was noted—to a degree which had not been present with CDs. And some recordings with which I am quite familiar—although not, to be fair, on the turntable/arm/cartridge combination at hand—had less inner detail than I had heard from them in the past. James Galway and The Chieftains' album In Ireland (RCA 5798:1-RC), for one example, displayed some loss of transparency through the midrange as the going got complex. While I am reluctant to ascribe this entirely to the Signets until I gain more familiarity with this analog setup, it did tie in with similar impressions gleaned from CD-based material. What I can say with assurance, however, is that the Signets were, overall, disarmingly effective in transmitting information from a front end which, on the basis of price, they probably had no business associating with.

At this point I felt it was time to "get real" and insert an amplifier which was more likely to be chosen for use with the Signets. Even here I probably stretched the point a bit by selecting the Kinergetics KBA-75 ($1495). The power output (75Wpc/8 ohms, doubling into 4 ohms) remained essentially the same as with the previous amplifiers. But whereas the prior auditions had used balanced preamp-to-power-amp interconnects, the Kinergetics did not allow for this; fortunately an unbalanced set of Cardas Hexlinks was at hand, so the change involved only terminations, not brand of cable (although the unbalanced Cardases were a few feet shorter than the balanced ones).

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Though my initial impressions with the Kinergetics in the system were mixed, the more I listened (and perhaps the longer the amplifier had to warm-up), the better things started to sound. While the SL280s do not appear to be all that amplifier-fussy (and I have no doubt that other, equally synergistic pairings for them are out there in Audioland), I began to feel that the Signets may have met their match—in the literal sense. The Kinergetics appeared to nicely split the difference between the sweetness of the Rowland and the incisiveness of the Classé, and added its own ingredient to the mix: a more robust, solid, defined low end than the Signets had demonstrated with either of the other amplifiers. And it was also with the Kinergetics that I really got a grasp of the surprising dynamic capabilities of the SL280s—on the way they "do" large-scale symphonic/choral/operatic material.

But I must digress a bit here. After I felt reasonably familiar with the sound of the Kinergetics/Signet combination, I decided it was time to compare the Signets with a natural competitor—the Thiel CS1.2. The Thiels, designed to be used directly on the floor, are priced somewhat higher than the Signets with the latters' dedicated stands. This was my first exposure to the 1.2s in a familiar listening environment, and I enjoyed it. They are very good loudspeakers. Their balance is, in my opinion, well-chosen, their midrange clarity and lack of colorations notable. They seemed a bit lightweight in the bass in my room, without really sounding thin. I noted their clean treble, though with a mixture of top-octave air and a slight softness directly below that, they seemed to lack just a shade of natural liveliness, coming across as either forgiving or just slightly silvery, depending on the program material. The soundstage was well-defined, but a bit small-scaled. Simpler program material was handled very well. Larger forces were a bit restrained dynamically, with a noticeable (though not severe) lack of low-end power. Altogether a very respectable performance for a loudspeaker in this size and price class. And to be fair to the Thiels, additional fiddling with placement (they were positioned in the same location as the Signets) might have improved the low-end heft, and a more powerful amplifier might have upped their dynamic quotient (though they're slightly more sensitive than the Signets—playback levels were adjusted accord-

ingly). In addition, the Thiels do not provide for bi-wiring and were therefore driven with a single run of AudioQuest Clear.

When I returned to the Signets, the first piece I played was the opening of the first act of Othello—the CD remastering of Karajan's 1961 London recording (411 618-2) with the Vienna Philharmonic. The sheer impact and dynamics of this performance are electrifying. No polite, laid-back nonsense here. Some music demands restraint, of course, but that is certainly not what Verdi had in mind. The opening to his Magnificat either evokes an emotional gut reaction or it leaves you flat. From the opening crescendo, to the live cannon shot (this is a John Culshaw production), to the chorus and the entry of the double-basses and the blatty blare of the brass, to the low-frequency underpinnings (the "hum" of the orchestra), the sound produced by the Signets on this piece defied their size and price. Their weaknesses remained, of course. As the going got heavy, the reduction of midrange clarity became audible and the sound became more forced, with some glare in evidence, prompting an inclination to back off a bit on the volume. And I also noted a tendency for the sound to become more two-dimensional at these high levels.

But we're talking here of a common limitation of small two-way loudspeakers. What was surprising was just how effective the Signets were in conveying the weight, drive, and dynamics of this heavyweight material. Within the limits noted, they seemed to relish in unleashing the fury of von Karajan's Vienna forces. They did not turn to mush at levels that might well make your neighbors want to make the same of you. The Thiels could not match the dynamic expansiveness of the Signets, nor the latters' way with the massiveness of the proceedings. I also preferred the more elevated soundstage provided by the taller (on stands) SL280s, finding it simply more involving and convincing. As was the case with the Signets' low end. The Thiels had the edge in midrange transparency and balance, though the margin was small; the 1.2s appeared less aggressive and consistent. It was a similar horse-race in the high end, with the Signets' subtly more precise lower treble lending them a trace more definition and silkiness. Both loudspeakers made music. The Signets added a bit of magic.

4 Perhaps, although for me Aida marks the peak of his creative powers.
Measurements

The impedance magnitude and phase angle for the Signet SL280 are shown in fig.1. The double peaks in the magnitude plot below 100Hz are typical of a reflex tuned cabinet. Note that the minimum impedance of the system is just below 7 ohms (at about 150Hz), indicating that no competent, appropriately powered amplifier (into 4–8 ohm loads) should have any difficulty in driving the Signets.

Fig.2 shows the impulse response. The ringing in the tail of the response is due to the ultrasonic peak in the tweeter's response—visible in the other plots and typical of a metal dome. Both drivers are connected in phase, and the response of the woofer lags that of the tweeter by about 0.2 milliseconds. This is clearer from the impulse responses of the individual drivers (not shown).

Fig.3 actually plots four separate measurements. The responses of the individual drivers (driven from their respective bi-wire terminals) are shown above 250Hz. Note the smooth, controlled rolloffs of the individual drivers, with no significant aberrations in the slopes which could color the response. The only significant anomaly is the narrow, 2–3dB blip around 900Hz. The 25kHz peak in the metal-domed tweeter is also evident—but all of its impact is well above the audible range. The measurements above 250Hz (as well as the impulse response and the data in the remaining curves) were MLSSA-derived. The curves below 250Hz (as well as fig.1) were measured with the Audio Precision System One test set. Below 250Hz are the nearfield low-frequency response measurements of the woofer and the port, with the curve to the far left showing the port output. It is evident that the port is tuned to around 30Hz. The output level for the port, as shown, is at an arbitrary level. There are various proposed methods of melding measured near-field responses of a low-frequency driver and port to form a coherent whole, but no consensus.

In fig.4, taken at tweeter level, the SL280's smooth response across the 30° lateral window is evident, implying a broad dispersion. With the exception of the minor dip and bump between 400Hz and 1500Hz, the midrange response is exceptionally smooth and level, the tweeter free of significant aberrations. Fig.5 provides a more detailed picture of the Signet's dispersion. In the curve closest to the front,
to the axis used in my listening tests. On the
dedicated stands, the tweeter is about 40.5”
above the floor, the woofer 34.5”. The height
of the stands appears to have been well chosen
to encompass the spread of average listening
heights. The next to the rear curve, taken on the
tweeter axis, is actually a bit smoother through
the midrange but with what appears to be a
narrow interference dip at 4kHz. And the rear
curve, at 7.5° above the woofer axis, shows why
these loudspeakers (along with most others,
I might add) are best not listened to while the
listener is standing.

These measurements agree closely with the
results of the listening tests and would be
impressive in a loudspeaker in any price range,
let alone one costing $900/pair. The waterfall
plot — more correctly termed the cumulative
spectral decay — shows how the frequency
response dies off over time after being hit by
an impulse. In theory it should drop off
immediately; no loudspeaker does, and the
response of the Signets is among the best we
have measured — regardless of price. There are
no significant audible resonances in the high
frequencies (the dark line around 15kHz is the
computer monitor’s scanning frequency; the
resonance at the far right is the 25kHz peak in
the metal dome’s response). The minor reso-
nance corresponding to the small rise around
900Hz may correlate with the slightly forward
quality noted in the listening tests, but this is
by no means certain, as the rise covers only a
very narrow band.

**Conclusions**

In the morning light of the next few weeks, as
I turn back to hearing Apogee Stages, Mirage
M-3s, and other more exotic, complex, and
pricey loudspeakers, I’m sure that I will doubt-
less be reminded that you get what you pay for.
But I suspect that I will also be reminded of the
old law of diminishing returns, and that the Sig-
nets were (and are) remarkably satisfying on a
wide range of music, from the most intimate
to the most bombastic. They are solid Class C
loudspeakers, in my judgment, but they also
pound heavily on the door of the far more
expensive and panache-drenched Class B
minimonitors. They will embarrass most of the
latter in their low-end reach and dynamic capa-
bilities, and challenge them seriously in sound-
ing and high-frequency detail and neutrality.
Only in the all-important midband will the
minis’ clearly more see-through transparency
allow them to keep their pride (and position)
intact.

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Fig. 5 Signet SL280, vertical response
family at 48°, from front to back: 30°
laterally off HF axis; below woofer;
on woofer axis; on HF axis; 7.5°
avove cabinet top

Fig. 6 Signet SL280, cumulative spectral-decay plot

Stereophile, October 1990
THREE ESOTERIC DIGITAL PROCESSORS

Robert Harley reviews the Esoteric D-500, D-10, and D-2

D-500 specifications: Frequency response: DC–20kHz ±0.3dB (44.1kHz sampling frequency), DC–22kHz ±0.3dB (48kHz sampling frequency), DC–15kHz ±0.3dB (32kHz sampling frequency). S/N ratio: >110dB at 1kHz. Dynamic range: >100dB at 1kHz. Harmonic distortion: <0.0016% at 1kHz. Channel separation: >110dB at 1kHz. D/A: Two dual 16-bit DACs with ZD and Noise Shaper. Filtering: 8x-oversampling, 25-bit digital filter with third-order Butterworth analog filter. Inputs: four digital, two coaxial on RCA jacks, two optical on TOSLINK jacks. Outputs: one stereo analog output pair, 2V RMS MOL, one digital coaxial output, 0.5V p-p/75 ohms. Power consumption: 14W. Dimensions: 8½" (225mm) W by 5½" (138mm) H by 15¾" (400mm) D. Weight: 13.25 lbs (6kg) net. Price: $1000.

D-10 specifications: Frequency response: DC–20kHz ±0.5dB (44.1kHz sampling frequency), DC–22kHz ±0.5dB (48kHz sampling frequency), DC–15kHz ±0.5dB (32kHz sampling frequency). S/N ratio: >100dB at 1kHz. Dynamic range: >97dB at 1kHz. Harmonic distortion: <0.002% at 1kHz. Channel separation: >97dB at 1kHz. D/A: Dual 18-bit with ZD circuit. Filtering: 4x-oversampling, 18-bit digital filter with fourth-order Bessel analog filter. Inputs: four digital, two coaxial on RCA jacks, two optical on TOSLINK jacks. Outputs: one stereo analog output pair, 2.5V RMS fixed, one digital coaxial output, 0.5V p-p/75 ohms. Power consumption: 14W. Dimensions: 8½" (225mm) W by 5½" (138mm) H by 18½" (458mm) D. Weight: 22.1 lbs (10kg) net. Price: $2000.

D-2 Specifications: Frequency response: DC–20kHz ±0.3dB (44.1kHz sampling rate), DC–22kHz ±0.3dB (48kHz sampling rate), DC–15kHz ±0.3dB (32kHz sampling frequency). S/N ratio: >110dB. Dynamic range: >108dB. Harmonic distortion: <0.0014%. Channel separation: >110dB. D/A: Four 18-bit with ZD circuit. Filtering: 8x-oversampling, 45-bit digital filter with third-order Butterworth analog filter. Inputs: four digital, two coaxial on RCA jacks, two optical on TOSLINK jacks. Outputs: two stereo pair, one pair balanced on XLR connectors (2.4V max output/600 ohms), one pair unbalanced on RCA jacks (2.5V max output/47k ohms), one coaxial digital output on RCA jack (0.5V p-p/75 ohms). Power consumption: 21W. Dimensions: 8½" (225mm) W by 5¼" (134mm) H by 19¼" (485mm) D. Weight: 24.25 lbs (11kg) net. Price: $4000.

All: Approximate number of dealers: 20. Manufacturer: Esoteric, a Division of Teac America Inc., 7733 Telegraph Road, Montebello, CA 90640. Tel: (213) 726-0303.

The Esoteric brand name may be unfamiliar to most audiophiles, but the Teac name certainly isn't. The Japanese electronics manufacturer has formed the Esoteric division to design and market upscale audiophile components, the new moniker distinguishing the line from the mass-market Teac brand. The division's first products include the three digital processors reviewed here, three matching CD transports (including the highly regarded P2), a DAT recorder, and three cassette decks, one of them being the first to incorporate the new Dolby-S noise-reduction system.

Teac is well known for both consumer cassette decks and semipro and professional recording equipment. In fact, Teac was largely responsible for the boom in small home recording studios that revolutionized the recording business in the 1970s. Many fledgling stars were first recorded on Teac multitrack tape machines. The company's model 3340 ⅞-track tape machine brought multi-track recording to thousands of home recordists. Teac also makes professional recording consoles and full-scale multi-track tape recorders.¹

The decision to enter the North American audiophile market was based on the success of the Esoteric products in Japan. Teac originally designed the line to make a technology statement about the company and had no plans for wide distribution. When the products were well received, they decided to go full-force into the audiophile market, especially the rapidly expanding product category of digital converters and CD transports.

¹I daily used a Teac/Tascam model 80-8 8-track machine professionally for over three years. One develops an affection for a piece of equipment that earns one a living.
The three digital processors reviewed here, priced at $1000, $2000, and $4000, represent a wide price range from a single manufacturer. I take particular interest in the design approaches of different companies toward digital converters, and was eager to see and hear what this new line has to offer. In addition, the three processors incorporate a unique dithering circuit, called "ZD," that reportedly improves low-level performance. Interestingly, the three converters use different circuit topologies, decoders, digital filters, and DACs.

**Review context**

All three Esoteric digital processors were auditioned in my dedicated listening room with my usual reference system. VTL 225W Deluxe monoblocks drove Hales System Two Signature loudspeakers (reviewed in Vol.13 No.7) bi-wired via AudioQuest Green Hyperlitz. After living with the Signatures for a few months now, my favorable impression of them has been reinforced. The D-10 and D-2 processors also saw auditioning time during my reviews in the September issue of three inexpensive loudspeakers. Level control was provided by the passive Electronic Visionary Systems Stepped Attenuator, which meant that the D-2 couldn't be auditioned via its balanced outputs.

Interconnects were 1m runs of Music Metre (processors to level control) and 4m lengths of Music Metre between level control and the VTLs. AC power was conditioned by an Audio Express NoiseTrapper. Also on hand for comparison were the Proceed PDP ($1295) and Theta DSPro Basic ($2000), both of which I've reviewed favorably. In addition, I have spent considerable time lately with some heavy-hitter processors, including the Wadia 2000 ($7800) and the Stax DAC-X1t ($12,000) in the same reference system. All comparisons between processors were made with the levels precisely matched at 1kHz by a Beckman AC voltmeter, with voltage measured at the power amplifiers' input terminals. Esoteric's P2, their top-of-the-line $4000 CD transport, drove all the decoders auditioned, as did a 48kHz signal from a JVC DAT machine playing my original master tapes.

2 The P2 is a gorgeous and impressive piece of equipment. More important, its superior sonics will convince all but the most closed-minded that CD transports do indeed affect the musical presentation. The "bits is bits" theory of digital audio comes under heavy assault from the P2.

**Esoteric D-500 Digital Processor**

**Esoteric D-500 Digital Processor: $1000**

The D-500 represents Esoteric's entry-level digital processor at the popular $1000 price point. The unit's styling is clearly of the beautiful Esoteric lineage. However, the fact that the D-500 is the budget model is readily apparent in the unit's modest construction relative to the standards set by the D-10 and D-2. The D-500 is lighter than the other Esotics, and the bent sheet-metal cover contrasts with the more expensive units' thick, polished metalwork. All three processors, however, share a brushed-aluminum front panel in a light champagne finish.

Four digital inputs (two coaxial and two optical) reside on the rear panel. Input selection is via a front-panel rotary knob labeled 1–4. An orange-tinted display beneath the selector knob indicates which input is activated and the sampling frequency of the selected input signal. Playing a pre-emphasized disc illuminates a de-emphasis indicator. When no input signal appears at the input selected on the front panel, a muting circuit disconnects the analog output jacks and a muting indicator lights up. Applying a digital signal to the selected input causes the "Operating" light to replace the "Muting" indicator. A square power switch finishes off the front panel. In addition to the four digital inputs, the rear panel holds a stereo pair of analog-output RCA jacks and a single digital output for driving a DAT machine. All the RCAs are gold-plated.

The D-500's interior construction is quite basic. The bent and punched sheet-metal chassis divides the unit into top and bottom halves, with the analog printed circuit board occupying the upper portion and the digital board the lower. The power transformer and small display pcb are located at the unit's front, just behind the faceplate. An inductor and capacitor filter the incoming AC before it reaches the
transistor. All power-supply components, except of course the transformer, are located on the pcb's they serve. The digital supply consists of a single 2200µF capacitor and heatsink TO-220 voltage regulator. This supply is surprisingly small in light of the fact that it must provide DC to 15 chips. The analog supply is more elaborate, with two 3300µF caps, and nine regulation stages with their attendant filter capacitors. Interestingly, the pcb has markings and lead-holes for four additional electrolytic filter caps, but these caps don't populate the board.

The digital section uses the Yamaha YM3623B S/PDIF decoder chip and the popular NPC 8x-oversampling digital filter. Two component-height copper shields separate the decoder and filter chips from other circuitry. The rear panel's four digital inputs are positioned so that they meet the pcb without the need for point-to-point wiring. A ribbon cable carries all digital signals from the lower digital board to the upper analog board.

The analog board, based on two Philips TDA1541 SI Crown dual 16-bit DACs, is divided down the middle into left and right audio channels. Philips measures all the TDA1541s after manufacture and grades them according to linearity. The SI Crown is the premium version and carries a higher cost. Each channel of the D-500 employs one dual-DAC chip, giving a total of four DACs. Unusually, each dual-DAC chip handles one polarity of both left and right audio signals. The second dual-DAC chip converts left and right audio signals, but of opposite polarity. The DACs' balanced, differential outputs drive separate Analog Devices AD42712 op-amps, used as current-to-voltage (I/V) converters. The anti-phase outputs from the I/V converters drive another AD42712 op-amp, but differentially. Up to this point, the digital circuit has been balanced; after this stage, it is single-ended. Any distortion or noise common to both signals and induced prior to this op-amp will cancel due to the common-mode rejection of the differential input op-amp. This is critical to the workings of the ZD circuit described below. The output amplifier is a Signetics NE5534 op-amp.

Resistors surrounding the I/V converter are 1% metal-film types, while 5% -carbon types are associated with the op-amp output stage. A dual-channel relay disconnects the output until the processor locks onto the input data-stream and can output a noise-free analog signal. Two trimmer potentiometers per channel adjust output level and DC offset. Like the digital inputs, the analog output jacks are pcb-mounted, eliminating the need for point-to-point wiring.

All three digital processors in the Esoteric line incorporate a proprietary circuit called "ZD" that reportedly improves resolution of low-level detail with a dithering circuit. Looking at the D-500's schematic, the ZD circuit is a single chip in the digital signal path just before the DACs. The chip is a small but dense Large Scale Integration (LSI) surface-mount device, which, judging by the ZD's block diagram, replaces what would otherwise be dozens of separate ICs. Interestingly, the ZD chip is mounted beneath the pcb. Without a careful inspection, it appears that the pcb lacks this chip since an apparently empty marking outlines the IC hiding beneath.

The ZD circuit generates dither in the digital domain and adds it to the datastream from the digital filter. The dither amplitude is varied according to the amplitude of the input signal. Typically, dither is white noise added to the signal to improve resolution. With dither, resolution below the Least Significant Bit's (LSB) amplitude is possible. Dither also disperses quantization error, making it more random and less correlated, resulting in a reduced "granulation" noise. Dither is commonly used in professional digital recorders.

The ZD chip also incorporates two "jitter cancel" circuits just before the output. The chip's four outputs require that any ZD-based decoder use four DACs, hence the use of two TDA1541s in the D-500. The dither is removed from the analog audio signal by two "Differential Type Automatic Dither Subtracting Circuits." This appears to be a differential input op-amp, which, by virtue of its common-mode rejection, will not pass signals common to both its inputs.

The result is improved conversion accuracy and reduction in quantization artifacts that are usually audible as "grit" in low-level signals, without the slightly compromised S/N ratio that normally accompanies the addition of dither.

The D-500's construction and layout are unmistakably Japanese. For example, the intricately punched, drilled, and formed chassis points to the Japanese ethic of investing cap-

Stereophile, October 1990
ital up-front on tooling in order to save money in the long run on ease of manufacture. Overall, I found the D-500 fairly well built for a $1000 digital processor, but not extraordinarily so. Its parts quality (excluding the DACs) and construction fall short of that offered by competing units in this price range. It should be added that the D-500 does use two of the expensive TDA1541 SI Crown dual DACs and the ZD chip, resulting in less of the build cost being available for other components. However, the styling and elegant champagne-colored brushed aluminum front panel add greatly to the D-500's appearance. At first glance, it appears to be a much more expensive product.

**Listening**: I began the auditioning by comparing the Teac D-500 with the Proceed PDP digital processor I reviewed in Vol.13 No.6. The $1295 PDP offers a good benchmark level of performance for an affordable D/A converter.

The most immediate difference I heard between them was in their treble presentations. The D-500 was decidedly softer-sounding and more laid-back in the top octaves. In addition, it lacked subjective extension in the extreme treble. On some overly bright CDs, this characteristic made the D-500 more pleasant and musical than the PDP. The forward and aggressive cymbals on the first Steps Ahead album (Elektra Musician 9 601668-2) were less so through the D-500. The tendency for many CDs to have a spotty quality was greatly ameliorated by the D-500's rendering. However, this interpretation also made the presentation less lively, and gave a "closed-in" perspective. On recordings that were not excruciatingly bright, I preferred the PDP's treble. The guitar and acoustic bass recording on the *Stereophile* Test CD3 (track 12), for example, was more open, detailed, and had a greater sense of air around the instruments through the PDP. The recorded acoustic opened up and came to life. This is due to the fact that much of this recording's ambience information comes from high-frequency reflections from the 140-year-old church's stone walls. The high-frequency-rich attack of the guitar tended to excite the room, meaning that the recording's spatial character will be somewhat dependent on the playback system's HF presentation. The D-500's laid-back treble just didn't reveal the spatial detail in this particular recording.

Further listening during this first session confirmed these impressions. However, the next day I began another session and, after two discs, had the exact opposite impressions of the two decoders' relative treble presentations. Now it was the D-500 that was brighter, more open, and forward in relation to the PDP. The D-500 also sounded louder. Since I had not changed the setup from the previous day, I was perplexed. After a short break, I began again with a fresh mind and different CDs. Now the two decoders' treble presentations reversed again to where I'd heard them during the first session. What was going on?

It didn't take too long to realize that, by coincidence, the CDs I used during the second session (when the D-500 was brighter) were recorded with pre-emphasis. (They were *Three-Way Mirror*, Reference Recordings RR-24CD, and Chick Corea's *Akoustic Band*, GRP GRD-9582). Apparently, the D-500's de-emphasis circuit was either not restoring flat frequency response, or was adding HF grunde that made the presentation seem brighter. Another possible factor may be that the D-500 has a higher output level than the PDP when playing emphasized discs. The PDP has a passive network, resulting in reduced output level when playing de-emphasized discs due to the circuit's insertion loss.4 The slightly higher volume would make the Esoteric's presentation seem brighter. Remember, the levels were matched by measuring the output levels when playing an unemphasized 1kHz sinewave. I'm eager to measure the D-500's de-emphasis error with the Audio Precision when the auditioning is completed. In addition, any level differences when decoding pre-emphasized discs will be revealed during the measurement portion of the review.

This is a good example of Peter Mitchell's contention in his "Industry Update" in July (Vol.13 No.7) that a digital decoder's de-emphasis error (or a level change associated with the de-emphasis network) can lead one to reach erroneous conclusions. A lesson from this experience is that one (especially a reviewer) should be aware of hidden variables when comparing components.

Moving on to other listening impressions, I found the D-500 to be good for its modest

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3 Available for $8.95, including shipping and handling; see the advertisement in this issue for ordering information.

4 I understand that perfect passive de-emphasis would reduce the level at 1kHz by an audible 0.37dB. —JA
price, but not outstanding. On the plus side, the D-500’s tonal balance was very smooth and neutral, without the shrill and aggressive treble that so often makes inexpensive digital playback unpleasant. In addition, the midrange was relatively free of glare and hardness. Textures tended to be soft, but somewhat lacking in bite and palpability. In my playback system, I felt that the D-500 was too laid-back and polite in the treble. It should be noted that my reference system, with the ultra-flat-response Hales Signatures, EVS passive control unit, and VTl tube monoblocks, is free from the metallic, edgy treble that plagues many of the low- to moderate-cost systems in which the D-500 is likely to be used. I suspect that the D-500’s treble presentation would be welcome in systems that lean toward an overly bright rendering.

The D-500’s bass presentation was somewhat toward the loose side, with less tautness and control heard through the PDP. The left-hand lines on Dick Hyman Plays Fats Waller (Reference Recordings RR-33CD), for example, were less crisp and punchy, making the rhythm appear to drag a little. Similarly, bass transients had less visceral impact. Bass drum lacked that extreme bottom-end dynamic kick that I find important musically. In addition, the two octaves between 40Hz and 160Hz were leaner than the PDP, with less body and warmth. Bass guitar was a little thin and threadbare, lacking weight. Chester Thompson’s bass pedals on Tower of Power Direct (Sheffield CD-17) were missing some of their drive and energy. However, the degree to which these traits were apparent varied considerably with the type of music and were musically significant with some program. (The PDP does have a somewhat warm LF rendering.)

The other areas of the D-500’s performance that I didn’t find completely satisfying were soundstage transparency and image palpability. There was less of that see-through transparency I find so important to the musical presentation. Rather than providing a pristine window on the music, the D-500 imparted a slightly grayish veil over the midrange and treble. This resulted in less ability to see into the soundstage, while making instrumental images less palpable. There was a tendency for lead instruments to take a back seat in the musical presentation. Female vocal seemed not to project forward of the loudspeaker plane, instead appearing slightly behind the loudspeakers.

The bite of lead guitar was softened to the extent that it reduced the energy and drive behind the solo.5 The naturally miked Handel’s Water Music (Harmonia Mundi 907010) exhibited a loss of air and life, the violins becoming somewhat flat and muted.

Overall, I found the D-500 competent but not outstanding. While not having that shrill, bright character often heard from inexpensive processors, its sound was somewhat lacking in life and detail.

At this point, I wondered if the other Esoteric processors would share these characteristics. I briefly listened to the other two just to get a feel for how the more expensive units sounded in relation to the D-500. As we will see, the D-10 and D-2 are fundamentally different, both in build and sonics.

**Measurements**: The D-500’s output impedance was a low 32 ohms across the frequency band, while its maximum output level when playing a 1kHz, 0dB tone was 1.97V. This level is close to the standard 2V, but lower than most processors’ output levels in practice. Measuring the D-500’s output level when playing an emphasized disc confirmed my theory of why it sounded brighter and livelier than the Proceed PDP when decoding pre-emphasized discs. Since the D-500’s de-emphasis circuit is active, the output level remains the same whether or not the de-emphasis circuit is switched in. The PDP uses passive de-emphasis with its slight attendant level attenuation at 1kHz with pre-emphasized CDs. I had matched levels before the auditioning with a non-pre-emphasized 1kHz signal.

I measured no interchannel phase error at any frequency. The D-500’s frequency response was perfectly flat (fig.1) and had no de-emphasis decoding error (fig.2). Looking at the spectral analysis of the D-500’s output when decoding a dithered -90.31dB, 1kHz tone6 (fig.3) revealed excellent performance. With the exception of a hint of second harmonic at 2kHz, no harmonics of the 1kHz signal are evident above the white-noise floor, there is a generally low level of spuriae, and no power-

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5 The solo to which I refer is Steve Morse’s brilliant guitar work on the tune “Hereafter,” from The Dixie Dregs’ Drugs of the Earth (Arista ARCD 60116), one of my favorite recorded guitar solos.
6 As the code representing this tone had dither applied when the CD was mastered, it should reproduce as a pure if noisy sinewave. Any distortion components present, therefore, can be laid at the door of the decoder and electronics.
line frequency noise is apparent apart from a very slight 120Hz component. In addition, the fact that the 1kHz peak exactly touches the −90dB horizontal division is an indication that the D-500 has good low-level linearity.

This is indeed the case, the D-500 having one of the best lineairities I've measured. The "Fade to Noise with Dither" plot (fig.4) shows a nearly perfect straight line, while fig.5 shows the D-500's deviation from linearity below −60dB. Figs.4 and 5 show the left channel; the right channel was nearly identical. This is excellent performance, but not surprising in light of the fact that the D-500 uses the premium grade

(S1 Crown) of the Philips TDA1541. (Philips's DAC grading system is based on low-level and differential linearity.)

Channel separation was good, but not excellent. Fig.6 shows interchannel crosstalk (left on right) as a function of frequency. The reduction in channel separation as frequency increases is typical. This test is made by decoding a 0dB (full level) swept sinewave in one channel and measuring its level in the other channel. There is some correlation between this measurement and soundstage width.

Listening to the Fade to Noise with Dither track on the CBS test disc confirmed the D-500's excellent low-level performance. The tone was smooth in its decay and relatively free.
from artifacts. Similarly, the Bonger Test on the Chesky Test CD also indicated good low-level performance.

Looking at the D-500's performance using a Heathkit/Zenith 8-bit storage oscilloscope, a full-level 1kHz squarewave reproduced with time-symmetrical ringing, but with the tops of the ringing waveform clipped; this is typical of the digital filter chip used (fig.7). Unusually, the linear-phase impulse response (fig.8) indicated that the D-500 inverted absolute polarity.7 The undithered -90.31dB, 1kHz waveform looked good (fig.9), though it didn't feature the clear steps between digital 0, +1, and −1 typical of the Stax processor, these being overlaid with audio-band noise. (The analysis bandwidth was set to 30kHz.) The monotonicity plot (fig.10) confirms the D-500's good linearity as measured with the Audio Precision System One.

Looking at the spectrum between 300Hz and 30kHz with the D-500 reproducing a 1:1 mix of 19 and 20kHz tones (fig.11) showed a very low level of intermodulation spuriae, with the 1kHz product buried in the noise. The 24.1kHz product was very well suppressed. Overall, the D-500 measured very well on the bench, especially considering its $1000 price.

7 Since the measurements, which were performed after the auditioning, revealed that the D-500 and D-2 invert polarity (unless the D-2's polarity-inversion switch is pushed) and the other processors to which they were compared (Esoteric D-10, Theta DSPro Basic, Proceed PD) do not, JA was justifiably concerned about the accuracy of my listening impressions. Recordings with incorrect polarity will generally sound better through inverting digital processors, while correct-polarity recordings will sound better through non-inverting digital converters.

There is just as great a chance that a recording is polarity-inverted as polarity-correct. Because I used roughly 20 CDs (as well as original master DAT recordings) during the auditioning, I am confident in my conclusions about the processors' sonic characteristics, as well as in the conclusions drawn from the auditioning. The respective processors' traits were consistent over a wide range of discs, indicating that the differences were intrinsic to the units under evaluation and not a result of one converter having the benefit of correct polarity.

Furthermore, I spent some time during the auditioning listening to the effect of inverting polarity with the D-2's remote-controlled polarity-inversion feature. The differences were far more subtle than those described in the processors' listening impressions.

Conclusion: I find it unusual that my main criticism of the Esoteric D-500 is a treble presentation that is too laid-back and lacking in air and liveliness. So often, digital playback is forward and aggressive in the upper octaves, especially with components at the $1000 price point. My system, however, is atypical of the playback systems with which the D-500 will most likely be used. In other systems tending to be forward and edgy in the treble, the D-500's smoothness may be a welcome addition. Indeed, the treble rendering which was a liability in my tube system may be an asset with a different component complement. My other
criticisms of the D-500 concern its polarity-inverting nature, which should be compensated for in A/B comparisons, and its lack of soundstage transparency. Although the D-500 presented tight and focused instrumental outlines, the illusion of depth was somewhat missing.

Moving on to the D-500's strengths, I found it offered a good overall musical presentation for its modest price. It had the ability to present smooth, velvety textures, without the hardness and glare endemic at this price point. This smoothness, coupled with the laid-back perspective, makes the D-500 unfatiguing, something that can be said about very few $1000 digital processors. The nonfatiguing quality, however, was at the expense of some life and excitement in the music.

I preferred the Proceed PDP's brighter treble and more open presentation, but at $1295, the PDP is priced 30% above the D-500—not an insignificant difference. In addition, the PDP is, in my opinion, probably the best of the inexpensive decoders. The D-500, however, came fairly close to the PDP's musicality. Incidentally, I found the D-500 quite good-looking and elegant, especially considering its reasonable cost.

The degree of these criticisms should be put in perspective: I have become a tough judge of digital playback since living with processors like the Wadia 2000, Theta DsPro Basic, and the magnificent tubed Stax DAC-X1t. For $1000, the D-500 does many things right, and some faults are to be expected. However, after auditioning the Esoteric D-10 and D-2 digital processors, I must conclude that the D-500 doesn't live up to the high standards set by its two big brothers, even when one takes into account the differences in price. In short, the Esoteric D-500 is competent, but comes up against stiff competition from other processors in the under-$1300 price category.

My criticisms of the D-500 should not be regarded as picking on an inexpensive unit that will have obvious deficiencies when compared to the D-10 and D-2, at double and four times the cost, respectively. I considered the D-500's price when judging its performance. However, I want to stress to potential purchasers that the D-500 is not just a slightly lower-performance version of its big brothers: it is significantly different, both sonically and technically.

The Esoteric D-500 isn't the best digital processor I've heard in this price range, but may be worth an audition if your system has an aggressive treble that needs taming.

**Esoteric D-10 Digital Processor: $2000**

Often, a model one notch higher in a company's product line is merely a feature-laden version of the less expensive unit. But the Esoteric D-10, though very similar in outward appearance to the D-500, is technically a different breed of cat: It uses different DACs, decoder, and digital filter, has a more solid construction, and uses higher-quality parts. It even uses a different version of the ZD circuit. As we shall see, it's also very different in its ability to convey a musical performance.

The D-10, however, is identical in function and features to the D-500. Four digital inputs are provided (two optical and two coaxial), with selection via a front-panel rotary knob. One of three front-panel lights illuminates to indicate the input sampling frequency (32kHz, 44.1kHz, or 48kHz). A vertical row of three LEDs indicates if the disc is pre-emphasized, and whether the unit is muted or operational.

The D-10 is built around a punched and formed steel chassis similar to the D-500's, but with more sturdy construction. The unit's top is thick, finely finished brushed aluminum that matches the front panel and adds an air of elegance; four heavy metal feet support the unit. Although the D-500 and D-10 have nearly identical-looking feet, the D-500's are plastic. The solid construction is said to reduce mechanical resonances in the converter and improve sound quality. The D-10's side panels have a black, rubberlike mat attached to the inside, apparently to increase the chassis's vibration resistance.

The rear panel is home to four digital inputs, a single digital output, a stereo pair of analog outputs, and an IEC AC power-cord jack. Like all the processors in the Esoteric line, the RCA...
jacks are gold-plated. The unit's construction is like one of those Chinese puzzle boxes: I had to remove 37 screws (and put them all back!) just to look at the digital board.

The digital and analog circuitry are on separate PCB boards, with the digital board mounted vertically, at a right angle to the analog board. Except for the large, encased transformer that occupies most of the unit's front section, the power-supply components are mounted on the two PCBs. The transformer is large (100VA) and encased in a metal shield. The analog board is home to three 4700µF filter caps, two full-wave bridge rectifiers, four TO-220 voltage regulators, and assorted capacitors. Surprisingly, the D-10 has fewer power-supply regulation stages than the D-500, but the component quality appears to be higher in the D-10. Also paradoxically, the digital section's power supply has no voltage regulators, relying instead on regulated ±5V DC from the analog board. This supply is filtered by additional caps (six 1000µF, four 2200µF electrolytics) not found in the D-500's digital supply.

The digital board is much more extensive than the D-500's and uses completely different decoding and digital filtering chips. The Sony CXD1076 decoder is used in place of the Yamaha, and the Sony CXD1088Q 4x-over-sampling digital filter is contrasted with the D-500's 8x-over-sampling NPC digital filter. It's interesting that Esoteric engineers chose the Sony filter chip for the more expensive D-10 instead of the NPC, which is found in many very expensive processors, including the $12,000 Stax DAC-Xlt. (California Audio Labs also chose the Sony filter for the Special Edition of their Tempest II player.)

Three copper shields rise just above chip level and run the length of the digital board to isolate the components' radiated noise from each other. As previously mentioned, the digital board is crowded with various-size electrolytic filter caps, but no voltage regulators. The D-10's Phase Lock Loop (PLL) circuit, which generates the system clock from the incoming S/PDIF digital input, uses a lithium-tantalate Voltage Controlled Oscillator (VCO) said to produce a "jitterless" clock signal for the processor.

Moving to the analog board, the D-10 uses Burr-Brown PCM64P dual-DACs rather than the Philips TDA1541A S1 Crowns found in the D-500. The DACs operate differentially to cancel the dither generated by the ZD circuit. (This circuit, composed of a single LSI found between the digital filter and the DACs, is discussed in the D-500's technical description.) Most of the resistors are 1% metal-film types and capacitors are polypropylene types. Current-to-voltage conversion (I/V) is performed by an interesting mix of 18 discrete FETs and a dual op-amp per channel. An MSB trimmer pot appears next to each DAC, while three copper shields separate the left and right channels. Additional filter caps are located right next to the 5534 op-amp output drivers. Two relays are employed, one to disconnect the output during muting, while the other switches in an active de-emphasis circuit, based on a 5532 op-amp.

Overall, the D-10 is very well constructed, with excellent fit and finish; its solid build, heavy feel, and elegant, attractive appearance exude a quality not felt from the D-500.

Listening: I auditioned the Esoteric D-10 in the reference system described earlier and compared its sound with that of the D-500, Proceed PDP, and the identically priced Theta DSPro Basic reviewed last month.

Very often, a family of digital processors has a distinctive sonic character common to all members of the line. Not so with the Esoteric D-500 and D-10 converters: they sounded very different, the D-10 clearly in another league. There was a quantum leap forward in all aspects of the D-10's presentation compared with the less expensive D-500.

First, the laid-back treble that gave the D-500 a veiled, closed-in sound was replaced by the D-10's open, spacious, and lively presentation. The entire soundstage bloomed, returning the excitement to the musical performances. The upper octaves, though much more forward through the D-10, were not aggressive. Rather than adding hash and glare, the apparently increased treble level revealed previously unheard transient detail, allowed a wealth of spatial information to emerge, and washed the opaque film off the window on the music. Percussion instruments that had been rather dull and congested jumped to life, returning the vitality and life to music.

The D-10's ability to resolve front-to-rear spatial cues was remarkable. There was a distinct impression of depth and space around instruments. Comparing the D-500 with the
D-10 using my acoustic guitar and bass recording from the Stereophile Test CD was particularly revealing. The D-10 presented the instruments in a three-dimensional space, surrounded by air and ambience. By contrast, the D-500 seemed to truncate the recorded acoustic. With CD after CD, I was impressed by the D-10's sense of space and depth. In addition, the D-10 threw stronger and more stable center images, detached from the loudspeakers. Part of the D-10's impressive soundstaging ability is due to the transparency and clarity of the rendering. Instrumental images were clearer and more palpable, seemingly spatially distinct from one another.

The D-10 also excelled in dynamics and low-frequency performance. The entire bottom end was tight and punchy, giving music a sense of foundation and rhythmic drive. The midbass leaness I heard through the D-500 was replaced by a warmth and roundness. The plucked acoustic bass on Scott Kreitzer's album Kick 'n Off (Cexton CR1264) had a sharp transient attack, coupled with liquidity and excellent pitch definition. All these characteristics made performances through the D-10 involving and musically satisfying.

Clearly, the D-10 was vastly superior to the D-500 in every respect. Rather than continue with this lopsided comparison, I replaced the D-500 with the Proceed PDP (the EVS Stepped Attenuator has two inputs) and matched levels.

The PDP proved a greater challenge. Though the PDP's presentation was closer to the D-10's than to the D-500's, I preferred the D-10 overall. By comparison, the D-10 was brighter, more detailed, and vivid, though not to the extent heard in the D-500 comparison. I find that bright and highly detailed digital processors can be strident, unpleasantly etched, and fatiguing. Not the D-10. Despite its lively and detailed character, the D-10 was musical and enjoyable, the forward treble imparting an openness and "big" character to the performance. Dynamics were excellent, presenting musical climaxes with effortlessness and authority. In addition, transient leading edges were sharp and quick, further adding to the impression of life and detail. Percussion on the previously mentioned Three-Way Mirror was razor-sharp and lifelike.

The D-10 had a greater sense of space and soundstage depth, one of its strongest attributes. In addition, the D-10 provided a more transparent rendering, with instrumental outlines focused and occupying their own space in the soundstage. Soundstage width was equally impressive: the D-10 provided an expansive window on the music. This width was retained toward the rear of the soundstage, with rear-positioned instruments not collapsing toward the center, as is common.

In my August review of the Theta DSPro Basic, I said it was the best processor I'd heard short of the $12,000 tubed Stax DAC-XIt. Does that still hold true after listening to the Esoteric D-10? Yes. As good as the D-10 is, it nevertheless fell short of the Theta's remarkable performance. Both processors' presentations were very similar: open, spacious, highly detailed, and with excellent dynamics and solid bass. They were clearly in the same league. However, the D-10 has a slightly more laid-back quality that may appeal to some listeners. As far as build quality goes, the D-10 wins hands down. In addition, the D-10's gorgeous appearance and additional features (four digital inputs, including two optical not found on the Theta) make it well worth an audition.

**Measurements**: The D-10 put out a level of 2.69V when playing a 0dB tone, 2.6dB higher than the standard 2V. Like the D-500, the output level remained the same, regardless of whether the de-emphasis circuit was switched in or out. Interestingly, the D-10's frequency response (fig.12) was less flat than the lower-priced D-500, with a slightly rising response above 5kHz. This is a very small deviation, however (note the 0.5dB/division vertical scale), and may be only marginally audible.

![Fig. 12 Esoteric D-10, frequency response (right channel dashed)](image-url)
Fig. 13 Esoteric D-10, de-emphasis error (right channel dashed)

Fig. 15 Esoteric D-10, fade to noise with dither, left channel

Fig. 14 Esoteric D-10, dithered 1kHz tone at −90.31dB with noise and spuriae, right channel dashed (1½-octave analysis)

Fig. 16 Esoteric D-10, departure from linearity, left channel

"Fade to Noise with Dither" plot of fig.15 and the departure from linearity graph of fig.16. The "Fade to Noise with Dither" test signal is a 500Hz sinewave whose amplitude varies continuously from −60dB to −120dB over a 30-second period. Since no digital converters have perfect linearity, the reproduced output level will not track exactly the test signal's amplitude envelope. This is manifested as curves in the 45° line in the "Fade to Noise with Dither" plot. The linearity graph is made by looking at the time and amplitude data from the "Fade to Noise" test and computing the departure from perfect linearity. The left and right channels were virtually identical, with the left channels shown in the figures.

The D-10 reproduced the "bonger" test on the Chesky Test CD with an extremely low level of noise and artifacts, the tone decaying into near silence. This is a particularly revealing test of a converter's low-level performance; the Esoteric's good showing could be due to the ZD circuit. In addition, listening to the "Fade to Noise" track on the CBS test disc confirmed the D-10's excellent linearity. The low-level plots taken with the MLSSA system (monotonicity, undithered −90.31dB 1kHz tone) correlated with the good measurements obtained with the Audio Precision, while the linear-
phase impulse response (fig.17) revealed a polarity-correct output. A 0dB, 1kHz squarewave reproduced with time-symmetrical ringing (fig.18). Unlike the D-500, the peaks weren’t clipped.

Left-on-right stereo separation (fig.19) was 100dB across the band, about 20dB better than the D-500’s separation. Right-on-left separation was a little greater, at 110dB up to 4kHz, but dropped to 100dB at 20kHz. This is generally excellent performance. The 0dB, 19+20kHz spectrum (fig.20) was better than that of the D-500 in that the second-order sidebands at 18 and 21kHz were lower in level, but a trace of 24.1kHz product can be seen. The D-10’s reconstruction filters offer a little less suppression of ultrasonic spurious than those of the cheaper processor, but this is still excellent.

Overall, the D-10 measured very well, but interestingly less well on some tests than the less expensive D-500.

**Conclusion:** Judging from the Esoteric D-10’s design, build quality, and sonic performance, it is a serious attempt at a high-end digital decoder. In that endeavor, it has succeeded. The D-10 offers a very high level of musical performance for its price, warranting a Class B rating in *Stereophile’s* “Recommended Components” listing.

On the plus side, the D-10 conveyed a convincing illusion of soundstage depth and spatial nuance. Coupled with its transparency and image palpability, the D-10 provided a clear view of the musical performance. The treble presentation, though forward, was not strident orhashy. In addition, I found that the round, liquid bass rendering added a satisfying warmth and body to the presentation. Dynamics were excellent by any measure, especially low-frequency transients. The punch and quickness in the low end added greatly to music’s rhythmic intensity. Overall, I very much enjoyed listening to music through the D-10—the ultimate statement of its worth. Also a plus for the D-10 is its fine build quality, excellent fit and finish, and elegant appearance. I would, however, like to have seen an absolute polarity inversion switch, especially at the D-10’s $2000 price.

On the down side, the detailed and vivid treble presentation, though appealing to me in my playback system, may not suit all tastes and component complements. In addition, the treble tended to be slightly hard rather than silky-smooth. As with all purchase decisions at this level, an audition in your own system is advised. Compared with the similarly priced Theta DSPro Basic, I preferred the Theta’s sonics. The DSPro Basic had greater transparency and a smoother treble presentation. However, the Basic was no match for the D-10 in fit, finish, elegance, and styling.

Overall, I found the Esoteric D-10 eminently enjoyable and musically satisfying. Its beautiful build, elegant finish, and superb sonics establish it as a worthy high-end contender in its price range.

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*Stereophile, October 1990*
Esoteric D-2
Digital Processor: $4000

The D-2 is beautifully built, befitting its $4000 price tag. Very similar in appearance to the other two Esoteric processors, it has a richer, more elegant look. The faceplate is thick, champagne-colored aluminum, some of its surfaces looking brushed, others appearing sandblasted. The side panels are coated with a greenish material, 3M’s “Nextel” finish. Nextel has a velvety texture and appears to be relatively immune from mechanical vibration. The D-2 looks nearly identical at first glance to the companion P2 CD transport. Overall, I found the D-2’s styling gorgeous, it’s fit and finish impeccable. It is truly a work of art.

Like the other processors in the Esoteric line, the D-2 offers four digital inputs (two coaxial, two optical) and one digital output. The D-2, however, has several features not found on the less expensive units. First, both balanced and unbalanced outputs are provided on XLR connectors and RCA jacks, respectively. A front-panel switch allows the user to invert absolute polarity in the digital domain. A second, identical switch mutes the processor outputs on command. Both pushbutton switches have small LEDs within them to indicate their status. Rather than using a rotary input-selector switch, the D-2 has a gold-plated bar that runs most of the front panel’s width. Pushing this bar increments the input number selected, and a numeric display indicates which input is activated. The gold bar adds to the similarity in appearance between the D-2 processor and matching P2 transport: the transport’s disc drawer is of identical dimensions and finish to the processor’s input selector bar.

An orange-tinted window displays the D-2’s operating conditions to the user. In addition to indicating the sampling frequency and input number selected, the message “SEL” tells the user that the input selected is not connected to a digital source. This is accompanied by a small green light below the power switch that turns orange when an active input has been selected. An indicator also reveals when the D-2’s de-emphasis circuitry has been engaged. In a nice touch, a small flush-mounted knob on the side panel adjusts display brightness.

One feature I grew attached to during the auditioning was the D-2’s extensive infrared remote control. This remote is supplied only with the P2 CD transport: one remote controls

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8 Most engineers, without concern, invert absolute polarity back and forth many times during the recording and playback process. There is the same chance a recording is of correct polarity (a compression wave from the instrument producing a compression wave from the loudspeaker) as incorrect polarity (a compression wave from the instrument producing a rarefaction from the loudspeaker). Usually, no one knows the polarity of the signal by the time it gets to CD, making experimentation the only way to determine the correct polarity. Whichever position makes the solo instruments seem closer to the listener is correct.

When Bob Katz and I transferred the 3½" analog master tapes from Stereophile’s Poem LP to digital, we knew the polarity inversions in the recording/playback/digital conversion chain and, consequently, knew that the final CD would have correct absolute polarity. This is, however, a highly unusual situation.
both units. The RC-356, the number given to the IR controller, is a large unit finished in the champagne-colored aluminum and Nextel material described earlier. The remote-controllable processor functions include input selection, muting, display on/off, polarity inversion, and output level. In addition, a portion of the remote is dedicated to transport functions and programmable play. It was handy having these functions combined with the transport functions on the same remote.

The feature that really sets the D-2 apart from other processors, however, is the ability to vary the output level in the digital domain. A small front-panel knob adjusts the D-2's volume, with the attenuation amount displayed in the front-panel window. The detented knob attenuates in 0.1dB increments (0 to −6dB), 0.5dB increments (−6 to −12dB), 1dB increments (−12 to −20dB), 2dB increments (−20 to −30dB), 5dB increments (−30 to −50dB), and one 10dB increment (−50dB to −60dB) of attenuation. This level control allows precise level matching between components in your system. In addition, I found it interesting to vary the volume and compare the subjective impression of level changes to the precise readout on the D-2's display.

Rather than put the signal through a potentiometer or another amplification stage to adjust the gain, the D-2 performs mathematical calculations on the digital datastream to attenuate the level. In this process, each digital sample is multiplied by a number less than 1, the actual number determined by the amount of attenuation desired. To achieve a 6dB reduction in output voltage, for example, each digital sample would be multiplied by 0.5, reducing its value by half. (Each halving of voltage results in a 6dB reduction.) The volume knob selects the coefficient (the multiplier) applied to the digital attenuator. Volume adjustment is also provided on the remote control.

The D-2's top cover is removable in two sections, just like the companion P2 transport's. The metalwork is thick and finely made. Inside, the D-2 is more elaborate than its less expensive siblings, with a separate power-supply board, more extensive filtering and regulation, and premium components. In addition, the D-2 features a microprocessor board that controls the digital-domain attenuation, polarity inversion, and muting.

The D-2's power supply consists of a large transformer and separate pc board for filtering and regulation. Additional filter caps and TO-220 regulators populate the analog pcb. Four large 10,000µF electrolytic caps and six voltage regulators comprise the bulk of the power-supply pcb. Metal shielding encloses the power supply, isolating it from neighboring components. In fact, the D-2's chassis is divided into four separate boxes within the main chassis to isolate the various sections. The segregated areas enclose the power transformer, power-supply board, digital board, and analog board, respectively. In addition, the chassis was designed to minimize vibration.

Digital and analog electronics are on separate pcbs, the digital mounted right-side up and running parallel to the chassis sides. All signal lines between the two boards are balanced, a technique I've never seen before. This is accomplished by phase-splitting the digital filter outputs before they are sent to the analog board. Both pcbs have gold-plated traces to improve signal-transmission characteristics.

Although the digital board has extensive power-supply filter caps (18 1000µF electrolytics), no regulators are found on the board. Instead, all regulation is performed on the separate power-supply section. Interestingly, each of the three Esoteric processors uses different digital filter chips. The D-2 employs the Sony CXD1076P decoder (like the D-10) but uses the Sony CXD1244S 8x-oversampling digital filter. A third-order Butterworth analog filter is employed in addition to the digital filtering.

All resistors on the board are 1% metal-film types. Three copper shields rise to component height and run the length of the digital board to isolate the decoding and digital filtering sections. The pcb is positioned so that the digital input jacks meet the board, eliminating point-to-point wiring.

The analog board occupies about two-thirds of the D-2's underside. The single board is divided down the middle by three copper shields to isolate the left and right audio channels. Unlike the digital board, the analog section has extensive power-supply regulation next to the circuits they serve. Six three-pin regulators per channel are used, along with 16 electrolytic filter caps.

Digital/analog conversion is performed on the analog board by four Burr-Brown PCNI701P DACs, a device I haven't seen used in digital processors before. Two DACs per channel create
a balanced signal without need for a phase splitter in the analog circuit. Before reaching the DACs, the digital datastream is first processed by the ZD circuitry discussed in the technical description of the D-500. Current/voltage conversion is performed by two NJM072DE dual op-amps (four total, one for each DAC). The active de-emphasis circuit, based on NJM5532SD op-amps, is switched in by a relay. Additional NJM5532SD op-amps form the final output driver amplifier for the unbalanced outputs, while the balanced outputs are driven by a combination of the same type op-amps and FETs. It should be noted that the signal through the D-2 stays completely balanced from the digital board, through digital/analog conversion (using four DACs), current/voltage conversion, de-emphasis, and the final output drivers to the XLR connectors.

Capacitors appear to be of high quality, and metal-film resistors are used throughout the analog circuitry. In addition to the de-emphasis switching relay, each channel uses two relays to mute the balanced and unbalanced analog outputs. The analog board is large and densely populated with caps, resistors, and voltage regulators.

One of the D-2’s most interesting features is found on a small board next to the analog section toward the unit’s front panel: a microprocessor chip. The IC controls many functions including polarity inversion, muting, attenuation display, and digital-domain attenuation. The front-panel attenuation knob is called a “rotary encoder” whose movement is interpreted by the microprocessor, rather than directly affecting a gain circuit. This is reflected in the unusual operation of the knob. If turned clockwise far past the point of no attenuation, a single detent-stop turn counterclockwise results in 0.1dB of attenuation. In other words, it is the relative movement of the knob rather than the knob position that adjusts attenuation.

The Esoteric D-2’s design is interesting and elaborate, boasting a slew of innovative approaches: fully balanced digital signals, microprocessor, digital-domain attenuation, remote control, the ZD circuit, and the unusual Burr-Brown PCM 1701P-K DACs. In addition, the unit’s beautiful build, high parts quality, and gorgeous styling all add up to quite an ambitious digital processor.

Enough techno-talk. Let’s find out what really matters: how the D-2 reproduces music.

Listening: I listened to the D-2 at length after having auditioned and written about the other two Esoteric processors. The D-2 also saw extensive auditioning during my reviews of three inexpensive loudspeakers in the last issue. I wondered how much sonic improvement the D-2 would offer over the excellent D-10, especially considering that much of the extra cost apparently went into build quality and features like the remote control and digital-domain output-level attenuation.

After listening to my guitar and bass recording on the Stereophile Test CD through the D-10, I listened again through the D-2. To my surprise, there was another leap in performance, even beyond that of the D-10. As I began to go through my CD collection, I found music so enjoyable through the D-2 that I put down my notepad and just listened for a while. Clearly, the D-2’s ranks among the best digital playback I’d heard. The more I listened, the more I liked it—the D-2 had all the characteristics that distinguish a truly great processor.

Starting with the D-2’s tonal balance, I found it very neutral, without emphasis on any particular frequency range. The D-2 offered superb low-frequency reproduction with a tight, authoritative bass, providing a solid musical foundation. In addition, low frequencies had round warmth that seemed to engulf the listener. With plucked acoustic bass, the resonant body of the instrument was clearly heard, adding to the D-2’s ability to resolve pitch. The treble was a little more subdued than the D-10’s, giving the D-2 a warmer, more involving character. Despite the slightly softer HF rendering, the D-2 was much more detailed than the D-10. The D-2 is highly detailed, like the Theta DSP0 Basic, but its detail comes from nuance and inner detail rather than an etched, “in-your-face,” aggressive presentation. This ability to reveal an instrument’s or voice’s subtle tonal shading was remarkable. Low-level harmonic detail emerged, giving instruments a palpable, believable presence. This finely woven rendering gave instrumental textures a round, velvety character that drew me into the musical performance. The presentation was the antithesis of cardboard sterility.

The D-2 excelled in one area where digital playback often falls short: the ability to distinguish one instrument’s character amid many other instruments. Even during complex passages, I could pick out an individual instrument...
and resolve its tonal shadings. Repeating the passage, I could similarly focus on a different instrument. This is analogous to the psycho-acoustic phenomenon called the "cocktail party effect," in which a single conversation can be chosen and resolved from among many voices, despite their equal amplitude. Most other digital processors tend to homogenize instruments and obscure their individuality. Try the track "Pools" from Steps Ahead's first album: the acoustic bass and sax play a dual lead. There is complete distinction between the two very different-sounding instruments, their individual tonal shadings unaffected by the other instruments. Also on the same track, listen to how the vibes emerge with their character intact through the sax melody. The D-2's ability to resolve these types of subtleties place it among a select group of digital processors.

Dynamics were among the best I've heard from digital playback. Low-frequency transients were effortless, even on full-scale orchestral climaxes. The D-2 seemed to have greater LF extension on transients, giving some music a high "jump factor." This sudden attack was accompanied by an equally sudden decay, resulting in tight, punchy, well-controlled bass dynamics.

The D-2's ability to present LF transients with speed and snap applied to the rest of the frequency spectrum. Mid- and high-frequency leading edges were razor-sharp, without the smearing that robs music of its life and vitality through lesser processors. Percussion instruments in particular had a clean, fast quality that made them jump from the soundstage. Cymbals had a lively character whose vividness came from their true transient nature, not from an overly bright rendering. In addition, subtle dynamic shadings were revealed that further added to the realistic tonal qualities of instruments and voice. The dynamic contrast between loud passages and instrumental subtleties gave the presentation a relaxed, unstained feeling. Cymbal crashes, for example, were reproduced with a sharp, dynamic leading edge, yet nuances and subtleties in the tail end of the instrument's decay were clearly resolved. These characteristics made the D-2's presentation exciting, vivid, and musically interesting.

I've saved the D-2's best attribute for last: its huge, transparent soundstage. The sheer size of the presentation, both laterally and in the depth axis, was stunning. The soundstage extended beyond the loudspeaker boundaries on some recordings, giving the impression of enormous space. At times with my eyes closed, it was hard to believe I was sitting in a 14'-by-21' room. Instrumental outlines were rock-solid, focused, and surrounded by a sense of air. Image placement in the left/right perspective was outstanding, with centrally placed instruments having a stronger, more palpable image than one usually hears. For example, the vibes on Jazz at the Pawn Shop (Proprius PRCD 7778) existed in space, with each note spatially distinct and completely disassociated from the loudspeaker. The image remained just as strong and focused, no matter from where in the soundstage it emanated.9

Soundstage depth was equally impressive. There was a clear feeling of the listener being transported to a much larger room, especially on naturally miked recordings that capture spatial detail. One recording I like both musically and sonically is Three-Way Mirror (Reference Recordings RR-24CD), recorded by Keith Johnson. The D-2 had the ability to reveal the wealth of spatial nuance in this recording. The distinct three-dimensionality of the recording was revealed by the D-2. Listen to how the percussion sounds miles away in the beautifully haunting "Sa Francisco River," with the guitar close to the front and Flora Purim's vocal floating between them. This degree of three-dimensionality is rare from digital playback. Even on multi-miked recordings, there was an increased front-to-rear resolution through the D-2. It was as though each instrument occupied its own space within the soundstage, never having to compete with its neighbors for attention.

This expansive soundstage was coupled with a pristine transparency that worked synergistically with the depth to provide a picture-window view on the music. There was a clear view into the very back of the soundstage, with hall reflections and low-level reverberation clearly resolved. In addition, it sounded as though there was more information in the decay, with individual reflections audible and

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9 As much as I like this recording and music, the decision to spread the vibes from one side of the soundstage to the other detracts from its amazingly real sound. Although all the other instruments occupy a realistic spatial presence, the vibes are way too wide. Their huge image would be realistic only if your head were 6" in front of them.

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their characters more apparent. This is contrasted with many digital processors that tend to make hall decay a homogenized continuum, without resolution of the components that make up the sound. The D-2's remarkable ability to reveal hall information was especially apparent on the Dorian organ transcription of *Pictures at an Exhibition* (DOR-90117). The long rests in this piece allow the hall reflections to decay into silence before the next note. The space between silence and the next note's attack was clearly shorter than that heard through many processors, indicating that there is more information on the recording than is revealed by lesser processors.

Although I found no serious faults with the D-2's presentation, one area of its performance can be marginally criticized. The D-2 has a tendency toward a slightly brittle character in the upper octaves during loud passages; textures seemed to harden a bit, especially cymbal crashes. However, this character became apparent only after extended listening, and was certainly not a significant aspect of the presentation. In addition, the D-2's soundstage transparency, although superb, was a little short of that offered by the Theta DSPtro Basic and Stax DAC-Xlt. Again, this is perhaps nitpicking: I never felt musically shortchanged by the D-2. In fact, the minor nature of these criticisms serves to throw into relief the D-2's overall superb sonics.

Incidentally, I could detect no degradation of the signal when the attenuator was moved from the unity gain position (no attenuation). Often, digital attenuators can introduce severe sonic problems due to quantization distortion being produced when the long digital word resulting from the multiplication by the attenuation coefficient is truncated back to 16 bits. Like the other two processors, the D-2 had no interchannel phase error. Output impedance of the unbalanced outputs was a low 21 ohms across the band. The balanced outputs had an output impedance of 27 ohms.

Frequency response was perfectly flat (fig. 21), but the D-2 had a slight de-emphasis error, shown in fig. 22. Although the positive amplitude error is only a quarter of a dB, the broadness of the curve and the fact that it occurs where the ear is most sensitive would add a slightly brightish character to the sound when playing pre-emphasized discs. I find it odd that while the D-500 and D-10 (as well as many low-priced CD players) have virtually no de-emphasis error, the $4000 D-2 is not perfectly flat. Although nearly all CD players and decoders have flat intrinsic frequency response, de-emphasis errors are fairly common. When auditioning digital processors, be aware of this fact and know which discs used for auditioning are pre-emphasized.

Examining the spectral content of a dithered 1kHz, -90.31dB sinewave (fig. 23) revealed a very low level of spuriae and power-supply-related noise. In addition, no harmonics of the 1kHz tone are evident. Linearity appears quite good, judging from the tone's peak just reaching the -90dB horizontal division. The right-
channel "Fade to Noise with Dither" plot (fig.24) confirms that the D-2 has excellent linearity. Deviation from linearity is shown in fig.25. The left channel was similarly good.

Stereo separation was excellent—the best I've measured after the $12,000 Stax DACX1t—at 130dB through most of the band, decreasing to 120dB at 10kHz. The L–R plot is shown in fig.26. (Note the different scale, -70dB to -140dB, of this graph compared with the -50 to -120dB graph scale used in the other two Esoteric processors' separation measurements.) With the "Phase" switch on—the orange lamp lit—the D-2's output was polarity-correct, as shown by the impulse response (fig.27). As with the D-500, the digital filter clipped with a full-level 1kHz sinewave—note the flat tops and bottoms of the waveform in fig.28—presumably because it has been optimized for low-level performance. A 1:1 mix of 19 and 20kHz tones at full peak level reproduced with the spectrum shown in fig.29. With a virtual absence of either intermodulation products or ultrasonic spurious, this is one of the best-measuring processors I have encountered.

This is excellent measured performance, but nothing in the measurements could indicate the D-2's superb musicality.

Fig. 23 Esoteric D2, dithered 1kHz tone at -90.31dB with noise and spurious, right channel dashed (½-octave analysis)

Fig. 24 Esoteric D2, fade to noise with dither, left channel

Fig. 25 Esoteric D2, departure from linearity, left channel

Fig. 26 Esoteric D2, crosstalk, left to right

Fig. 27 Esoteric D2, impulse response

Fig. 28 Esoteric D2, 1kHz squarewave at 0dB

Fig. 29 Esoteric D2, HF intermodulation spectrum (200Hz–30kHz), 19+20kHz at 0dB (30kHz measurement bandwidth)
**Conclusion:** By any measure, the Esoteric D-2 is an outstanding product. Its superb sonics rank it among the best digital converters currently available. Its strengths are many: a highly detailed yet unfatiguing presentation, smooth and silky treble, tight, powerful, and effortless bass reproduction, ability to reveal subtle tonal shading and nuance, and resolution of wide dynamic contrasts. Where the D-2 really excels, however, is in its ability to present a huge, spacious soundstage. This is one area that separates the good digital processors from the truly outstanding ones. The D-2 certainly belongs among a select group of converters that can throw a soundstage with a convincing illusion of depth, transporting the listener outside the confines of the listening room. Most important, I really enjoyed listening to music through the D-2. When I forget about reviewing and become immersed in the music, I know a product is fundamentally right in its ability to convey the performers’ musical intentions. The D-2 easily falls into this category.

However, a similar level of performance is available from the Theta DSPro Basic for $2000, half the D-2’s price. What distinguishes the D-2, and may justify the additional cost to some buyers, is the D-2’s extraordinary build, exquisite fit and finish, and additional features. Remember, the D-2 has a host of conveniences not found on the Theta: balanced outputs, four digital inputs, de-emphasis and sampling rate displays, variable output level, and, most important, a full-function remote control. Sonically, they are very similar: both are among the best digital has to offer. Rather than finding one clearly superior to another, I found them to interpret the musical performance slightly differently, making one preferable on one recording and the other processor more enjoyable on another.

The Esoteric D-2 is clearly in Class A territory in *Stereophile’s* "Recommended Components." It ranks among a handful of digital processors that take digital playback to its ultimate possibilities.

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**FOCAL ARIA 5 LOUDSPEAKER KIT**

Dick Olsher

Type: three-driver, two-way, bass-reflex. Frequency response: 70Hz-19kHz, ±2dB. Sensitivity: 90dB spl for 1W at 1m. Input impedance: 4 ohms nominal. Dimensions: 8.5" W by 9.75" D by 18.5" H. Prices: $600/pair for a complete kit, $700/pair assembled (prices are approximate, as they will be set by each distributor). Approximate number of dealers: 8. Sponsor: Focal America, Inc., 1531 Lookout Drive, Agoura, CA 91301. Tel: (818) 707-1629. Review sample obtained from: Madisound Speaker Components, Box 4283, Madison, WI 53711. Tel: (608) 831-3433.

You don’t have to be a seasoned speaker builder to recognize the Focal name. For years they’ve offered the home constructor a full assortment of quality drivers and kits. The kits were designed in-house—mostly by Focal in France—and, according to Focal, they represent fully engineered and tested systems. The Aria kits (the 5 and the 7), depart from Focal’s past policy, in that the project was a collaborative design effort between Dr. Joe D’Appolito and Focal America. Focal’s main contribution was in the area of cabinet development, while D’Appolito was responsible for the system integration and crossover design.

D’Appolito is a contributing editor of *Speaker Builder* magazine, but is best known in the business for a driver configuration he originated and which is appropriately named after him. The basic D’Appolito configuration consists of an array of a single tweeter flanked by two woofers, one above and one below and driven in parallel from a single low-pass network. Both the high- and low-pass crossover networks are normally third-order types. D’Appolito has shown that the acoustic radiation pattern from such a system is quite uniform, both laterally and vertically, within a reasonably broad listening window. The symmetry of the vertical array is, of course, the main reason for the stability of the polar response pattern. This is the essence of the D’Appolito configuration as embodied by the Aria 5. The design objectives were for a horizontal frequency response uniform within ±30° of the listening axis and a smooth falloff at larger angles to reduce undesirable early reflections from nearby walls. The vertical response was to be uniform within ±15° of the listening axis.
to eliminate "venetian blind" effects. Again, a smooth falloff is desirable at larger angles to minimize ceiling and floor reflections. In general, many commercial speakers have poor vertical polar responses. You can usually find a single axis at which the response is pretty smooth. But as you move up or down—even within a narrow angle—the response deteriorates because of driver beaming or acoustic interference between the drivers.

I firmly believe that accurate and stable imaging requires a loudspeaker to offer uniform frequency response within a listening window that encompasses the head and shoulders at the listening seat. The ear/brain integrates acoustic energy reflected from the head and shoulders. Thus, it is not a single point in space that matters so much as the smoothness of the response in this region. D'Appolito is to be applauded for explicitly incorporating these design goals into the Aria 5 system concept.

The drivers chosen by D'Appolito were naturally restricted to those in the Focal line; the speaker, after all, should highlight Focal's driver technology. The 5K013-L woofer is a 5" midrange-woofer with a so-called K2 sandwich cone: Kevlar/Resin/Kevlar. The cone is slightly flared in an exponential fashion which, together with a phase plug, helps to extend the on-axis frequency response to almost 10kHz. But there's no way of cheating Mother Nature—the woofer starts to beam around 2kHz, the frequency where its size becomes of the order of the wavelength of the emitted sound. This is a moderately robust woofer with a 1" copper voice-coil on a Nomex former. The peak-to-peak maximum linear excursion is a decent 5.5mm. The power handling is not specified,
but I would guess it to be around 50W program. The tweeter chosen as "the perfect complement" for the woofers was the T90K, which features a concave Kevlar dome. This dome is claimed to produce smooth, extended high-frequency response with excellent polar dispersion and power handling.

The crossover was designed using computer-aided optimization techniques which allow the designer to take into account the actual impedance variations and acoustic responses of the individual drivers. The target response was a true fourth-order Linkwitz-Riley acoustic network at 2500Hz. The crossover network is shown schematically in fig.1. There are a couple of interesting features worth noting here: first, an upper-bass boost said to provide 5dB of lift at 200Hz, and designed to compensate for the diffraction loss of a free-space speaker; second, the series RLC circuit across the tweeter terminals is designed to damp the tweeter LF resonance, which lies at around 900Hz. This circuit provides a total of 40dB of electrical attenuation at the resonant frequency. Because the crossover point is only 1.5 octaves away from the tweeter's LF resonance, and because of the relatively mild third-order slope of the high-pass filter, the tweeter was considered at some risk of excessive diaphragm motion should even a small amount of electrical power enter the tweeter at this frequency. The RLC circuit effectively eliminates this distortion pathway.

The cabinet plans for the Aria 5 are shown in fig.2. The nominal internal volume is 15 liters. Assembled cabinets are available in solid maple and black-satin MDF from Watters Sound Waves in Dallas, TX, Tel: (214) 991-6994. Most of the kit distributors are also likely to offer a ¼" MDF cabinet made by Woodstyle, which is what I got from Madisound. This cabinet is pretty lively. Rapping the enclosure with your knuckles produces an upper-bass ring. Of course, ¼" MDF is far from the ideal enclosure material—I would greatly prefer a sandwich construction—but it's the ticket for a reasonable-quality cabinet at a bargain price. The enclosure side walls are lined with ¾" of acoustic foam while its top, bottom, and rear walls are lined with 2" of acoustic foam. Focal's
literature points out that "egg-crate" or "waffle" foam, commonly available as mattress pads, may also be used if acoustic-grade foam is not available.

The Aria uses a Quasi-Butterworth (QB) bass alignment to "obtain maximum bass extension from its midbass drivers." It's true that a QB alignment approximates a maximally flat frequency response and pushes the knee of the curve farther into the deep bass than is possible with other alignments. But there are significant penalties. An octave below the knee of the QB alignment, the bass response is down a whopping 18dB. An alternate alignment called Extended Bass Shelf (EBS), which I like very much, starts rolling off earlier but shelves out and is only down about 5dB where the QB alignment is down a constipated 18dB. In my experience, the EBS alignment, while not measuring as well as the QB, manages to subjectively sound like it has a lot more bass. An even more significant problem is the high box resonance that the QB alignment requires. All vented designs unload the woofer below the box resonance and excessive cone pumping and the attendant host of distortions this generates become a real danger. This is especially a problem during phono playback because of subsonic garbage. For the Aria 5, the box resonance frequency is 571Hz. There's a lot of clean, deep bass that will push the Aria woofers to the wall. Again, the EBS generally produces a box resonance that is almost an octave lower than that of the QB alignment—for the same woofer.

Because this was to be a speaker review and not necessarily a kit report, Madisound sent me a fully assembled and tested pair of Arias. Madison's Larry Hitch assured me that my pair of Aria 5s were built precisely per Focal's plans and instructions. Had I gotten their semi-kit, with fully assembled crossover boards and cabinets, I would estimate the final assembly as an evening's work suitable even for a first-timer. And here's a nice touch: A set of complimentary solid-brass binding posts may be had from Focal by simply mailing them a copy of your invoice for the components.

The Aria 5 is designed to be stand-mounted at least 3' from the rear wall and any reflecting side walls. More would be better, but less spacing is likely to cause bass emphasis and rough midbass response. The stand should elevate the speakers so that the tweeter axis is near ear level at the listening seat. A slight toe-in toward the listening seat is mentioned as being usually beneficial.

**Listening Impressions**

Situated in the minimonitor location in my
listening room—as per Focal’s guidelines—the Aria was quick to strut its stuff. Driven by the fabulous Air Tight ATM-2 tube amplifier, its rendition of the soundstage was quite startling in terms of capturing the spaciousness of the original recording venue. I’ve become quite familiar with the acoustics of the Troy Savings Bank Music Hall through numerous auditions of Dorian Recordings’ *The English Lute Song* (DOR-90109) and *Greensleeves* (DOR-90126). Here, the Aria clearly revealed hall reverberation while image outlines were tightly and cohesively localized within the soundstage. The sensation of 3-D or image palpability was not quite in the class of, say, the Ensemble PA-1, but at a fraction of that Swiss speaker’s cost, the Aria’s imaging performance was indeed amazing.

The integration of the bass octaves with the midrange proved to be another strength. You may recall the famous Martin-Logan Sequel II upper-bass hole, which squeezed the testosterone from male vocalists. The Aria will do none of that. It does not slight any one particular bass register. The reproduction of male voice, cello, and double bass was tonally quite authentic. The upper-bass/lower-midrange anemia that more often than not afflicts so many mini-monitors was blissfully absent.

There wasn’t a prodigious quantity of deep bass, which meant that orchestral foundation lacked authority. The Aria could not deliver even a hint of bass lines around 40Hz, which isn’t surprising in view of its chosen bass alignment. There’s extension to 60Hz, a little below the lowest note of the cello, but that’s all you get. The midbass was tight and nicely detailed, but the upper bass was a bit too thickly textured and congested, as if a dab of Heinz ketchup was allowed to permeate the fabric of the music. What this means, in plain English, is that the timbres of Peclard and Piñoux’s cellos (Offenbach, *Suites pour deux violoncelles*, Harmonia Mundi HMC-901043), while quite convincing in terms of pitch definition, lacked sufficient air and body to bloom to their full potential.

As expected of a vented design with a highish box resonance, the Aria had trouble with subsonic energy during LP playback. There was considerable cone pumping with accompanying loss of midrange smoothness. Use of the Pawel Acoustics Subsonic Filter greatly reduced the sense of strain due to distortion products that had crept into the midrange. Clearly, a good subsonic filter would be a wise investment for this loudspeaker—especially if you plan to listen to a lot of vinyl.

When it was not beset with subsonic challenges, the Aria’s midrange was consistently smooth and clean without a hint of any response glitches around the crossover frequency. There was plenty of midrange detail. *Laudate!* (Proprius 7800), one of my favorite choral music selections, features a heavily layered backdrop of male and female voices. The Aria breezed through without any problem in resolving massed voices.

I’ve deliberately left the bad news for last, principally to underscore the frustrations inherent in this business. The Aria showed such finesse in the areas of soundstaging, lower-octave integration, midrange tonality and detail, that in view of its asking price I was itching to embrace it with wide-open arms. But, alas, there were nasty things going on above 4kHz.

Take a look at fig.3. (This, as well as the other MLSSA measurements, were performed by JA, who has taken to this system like a fish to water.) What is shown is the impulse response of the Aria measured on the tweeter axis at a 48” distance. As you can see, the Aria rings for over two milliseconds, which usually means trouble in tweeter land.

The treble sizzle of the Aria 5 hits the listener squarely in the face. Sibilants were overemphasized and brass was too edgy in tone. Treble transients were spitty. Nylon strings sounded too hard and steely. Violin overtones were grainy and lacking in sheen. Massed strings managed to sound strident. The upper registers of female voice were somewhat rough during quiet passages, and quite obnoxious when things got loud. Of course, I could find recordings or particular cuts that were deficient in the treble and which were rendered acceptably well through the upper registers. But, on the

**Fig.3** Focal Aria 5, impulse response (original sample)
whole, even with one of the best tube amps money can buy, the treble continued to gnaw at me.

Naturally, I experimented with varying the listening axis in the horizontal plane. That this would help was evident from a set of in-room measurements I made with the Neutrik System 3100. (A 1/3-octave warble tone was used in all of these measurements.) At 4° on-axis with the tweeter (ignore the bass response at this distance), the rising response of the tweeter above 3kHz is quite evident in fig.4. Note that there is an over-response in the 4–8kHz and 15–17kHz regions. There is a useful reduction in treble energy 30° off-axis—especially in the extreme treble—as can be seen in fig.5. The Focal literature shows a well-behaved frequency response, with only small glitches around 7 and 17kHz. It is not clear, however, just how the published data were derived. On the basis of what had been promised, I had assumed that the tweeter was equalized to remove the on-axis rise above 4kHz. So finding the bright balance of the apparently raw tweeter intact was surprising indeed. Take a look at the righthand side of fig.6. Shown here is the Aria’s FFT-derived response on the tweeter axis averaged across a 30° lateral window. This is supposedly the promised land, the sweet spot within which the design should have provided a stable polar response that does not shift with frequency. The average response is, in fact, markedly elevated above 4kHz because the on-axis response is so hot.

Ultimately, the best means of achieving an off-axis listening environment turned out to be extreme toe-in so that the tweeter axes crossed over well in front of the listening seat. With no toe-in, so that the listener was given a more neutral treble balance, the imaging suffered, outlines becoming diffuse, which undermined one of the Arias’ strengths.

Let me forestall any suggestions of achieving the same end by toeing-out the speakers. In my opinion this would be a stupid move, resulting only in the creation of excessive lateral reflections by splashing a lot of energy at the side walls. Such an approach would negate the entire design philosophy of the Aria 5. If you’re going to do that, then you might as well consider an omnidirectional design.

If the treble problem were completely amenable to solution by the simple expedient of turning away from the hot axis, we would

![Fig.4 Focal Aria 5, 1/3-octave response in-room at 48° on HF axis (original sample)]

![Fig.5 Focal Aria 5, 1/3-octave response in-room at 48° 30° off HF axis (original sample)]

![Fig.6 Focal Aria 5, anechoic response averaged across 30° lateral window, with nearfield LF response plotted below 400Hz (original sample)]

...be home free. Unfortunately, the tweeter continued to ring.

The lefthand side of fig.6 shows the Aria’s bass response, measured in the nearfield of both the lower woofer and the port. The port can be seen to handle the range below 85Hz or so, its tuning revealed by the minimum in the woofer output to lie at 51Hz. This was confirmed by measuring the impedance of the speaker, the minimum value between the two peaks in the bass also lying at 51Hz (fig.7). Overall, this measurement confirms the Aria’s 4 ohm rating, with slight dips just below that figure apparent in the upper bass and the presence region.

**The tale of the tweeter**

Just exactly where the T90K tweeter rings may be gleaned from the MLSSA “waterfall” plot shown in fig.8. The activity around 15kHz is simply the sound of Kevlar breaking up. Kevlar, while rigid, is not as rigid as a good metal dome, meaning that its first breakup mode lies below 20kHz. There are also minor resonances in the
Aria 5's treble balance to be a bit on the bright side of reality. The network, consisting of a series half-ohm resistor with then a 3 ohm resistor in series with a 1.5µF capacitor shunting the excess highs to ground, may easily be inserted into the tweeter crossover leg, as shown in fig.9. I deemed any prospect of improving the treble worth investigating, and agreed to hold off continuing with the review until the parts arrived.

Fig.10 shows the frequency response of the Aria at 1m on-axis with the RC network installed. The impact of the network is obvious from a comparison of figs.4 and 10. There is clearly less treble output with the RC network in place. But the basic character of the treble remained unchanged: the impulse response of the modified speaker on the tweeter axis is shown in fig.11, its waterfall plot in fig.12.

The RC network to the rescue
After Kimon Bellas of Focal America heard that I was unhappy with the treble of the Aria 5, he called to inform me of an option that provides a gentle rolloff in the treble starting around 4.5kHz, and a cut of 3dB at 18kHz. This RC network is available to kit purchasers who feel the
Another listening session followed. I tried a number of listening axes. I switched amps and speaker cable. The treble failed to smooth out enough to make long-term listening enjoyable for me.

As a matter of fact, some performance aspects had deteriorated. The network veiled the soundstage so that the dramatic sense of transparency I experienced before was considerably diminished. Neither were image outlines as crisply defined as before. So, in the end, the network introduced as many problems as it solved.

An interesting finding, uncovered by JA, is documented in fig.13. Shown here is the vertical response family of the Aria 5 at a 48° distance. The middle curve is on-axis with the tweeter, while the curves immediately above and below it are on-axis with the woofers. (The top and bottom curves are the response 15° above the cabinet top and 15° below the cabinet base.) Surprisingly, the flattest axis is that level with the upper woofer; again, something one would not expect from the theory of the D'Appolito configuration. But since these measurements were made on the modified speaker, this anomaly could be due to the presence of the RC network.

Chapter Two
After perusing the pre-publication copy of this review—manufacturers are sent such a copy of reviews in order that they can respond in "Manufacturers' Comments" in the same issue—Kimon Bellas immediately raised a red flag, strongly suggesting that a faulty sample had been provided for review. Focal's measurements and listening tests, he said, were at odds with Stereophile's findings. It is not that unusual for a manufacturer to disagree with findings that cast a negative light on certain performance aspects of his product. Neither is it unusual for a manufacturer's measurements to deviate from our own. I'm not suggesting that Focal is guilty of this—in hindsight they clearly are not—but acoustic measurements can easily be manipulated by judicious choice of measurement locations to produce what appears to be exemplary performance. I should point
out that it is *Stereophile*’s policy to request a second sample if we suspect that the originals are defective. Other than bad sound in the treble, the Aria did not appear to be malfunctioning. Still, the fact that the first sample had not come directly from Focal persuaded JA to accept a second pair of speakers for evaluation.

Joe D’Appolito’s pair of Aria 5s were shipped to us. These are the firstborn pair and were used in generating Focal’s own measurements.

There were some clearly visible physical differences between the first and second samples. The cabinet was now solid maple; quite pleasing to the eye, but more significantly from a sonic perspective, the enclosure was much better damped than its MDF counterpart. The knuckle-rap test produced nothing more than a satisfyingly dull thud. A beautiful set of binding posts adorned the back baffle. No plastic here! Another nice touch was that all of the drivers were rebated into the front baffle.

Driven by a bridged pair of Classe Audio DR-8s, the new Arias easily surpassed the sonic performance of the original samples. The general impression was of a stronger affinity to the essence of the music. Specific improvements were apparent in three areas.

First, bass lines became much more distinct. The thick and muddled midbass textures that I complained about earlier evaporated. The bass registers of cello and double bass were clearly detailed and much tighter sounding. It became possible to follow bassline nuances with the greatest of ease. This served to catalyze the bass registers and the lower mids into a smooth, organic whole. The power range of the orchestra greatly benefited from the Aria’s robust textural tapestry, now amply sprinkled with detail. Despite its considerable resolving powers, the Aria did not descend to the level of many minimonitors in that it was emphatically other than anemic, threadbare, or analytical sounding. Many of these minimonitors remind me of toy tanks, zipping along the soundstage and pelting the listener with hails of detail. But because all of this detail is no longer camouflaged by an adequately fleshed-out lower range, their sound strikes me as artificial—hi-fi-ish rather than musical.

The Aria’s full-bodied tonal balance and considerable dynamic range demonstrate that it is not necessary to sacrifice either of these orchestral elements to achieve imaging excellence. Not only was the music’s dynamic ebb and flow on *Kol Nidrei* (Bruch: Collected Works for Cello and Orchestra, EBS 0600) easily accommodated with tonal authority, but the soundstage was sketched out with convincing spaciousness and transparency. I’ve earlier described the imaging capabilities of the Aria 5. If anything, these aspects of its performance matured to the point of placing me in more intimate contact with the music. I was finally beginning to understand why Kimon Bellas was so enthusiastic about this speaker. The Aria 5 can definitely sing!

And sing it did, and much more sweetly than before. The upper mids this second time around were sweeter and timbrally more accurate. The Lesley Test, track 13 on *Stereophile*’s Test CD, represents an excellent upper-midrange test (at least for me). Lesley’s vocal sweet spot is very much entrenched in this region. Thus, any upper-midrange aberrations in the reproduction chain are clearly highlighted by timbral inaccuracies through Lesley’s upper registers. Much of the sense of space and palpability inherent on the master tape has been obliterated from this track. I’m not sure why, but at least the final version of the CD has got Lesley’s timbre quite right. The older Aria had sounded dark and dry through the upper registers. The latest Arias managed to come much closer to reality, and the essence of Lesley’s voice came through unscathed. In general, the later Aria painted string overtones and soprano voices with a sweeter, lighter sheen. The old Aria was distinctly darker, more brooding in character, which made it all the more difficult to put up with the treble grain and sizzle.

JA measured the new pair of speakers at the same position on the identical axis, in order to compare with the old. Fig.14 shows the MLSSA-derived anechoic response of one of the new

![Fig.14 Focal Aria 5, anechoic response at 48" on HF axis of D'Appolito sample (top) compared with that of original sample with HF shelf (bottom)](image-url)
pair (top) compared with one of the old pair. (The pair-matching of the new pair was excellent, he felt.) The measured improvement through the entire treble range offered by the new speaker is obvious, as is a superbly smooth midrange.

Finally, the lower-treble grain and roughness that so irritated me earlier was somewhat reduced. The level of grain went from coarse to fine sandpaper. But—and here we come to the Achilles heel of this design—the lower treble still sizzled. Therese Juel's sibilants (Opus 3, Test Record 1) splashed out of control. Soprano upper registers were tinged with an overly bright character. Nylon-stringed guitar's natural brightness became accentuated. The treble brightness became a glare, then a scream during loud passages. There were moments when I was captivated by the glory of the midrange, only to be irritated a few seconds later by the relentless quality of the upper octaves. During quiet passages there were always moments of great joy when the treble coloration was sufficiently low to be masked by the program material. But as soon as the music got going, the treble intruded. Further experimentation with speaker placement again confirmed the wisdom of listening to the treble driver off-axis: using a significant toe-in allowed the tweeter axes to cross over well in front of the listening seat. Still, the sizzle and grain continued to annoy me. The bright lower treble also cut into the long-term listenability of the Aria. Fig.15 shows the "waterfall" plot for the new sample of the Aria 5. The treble hash remains, while there is some resonant overhang at 4.5kHz which might correlate with my feeling of brightness.

To judge from the popularity of bright tweeters, it seems to me that bright and sizzly treble is very much in demand these days. Treble sizzle is a sensation that should be in the public domain as plain as that of wind on your face. There should be no mistaking it. Yet many audiophiles actually like it hot. Is it a case of shifting cultural tastes? Have we been conditioned by electronic music, with its ability to produce copious amounts of treble, to actually crave it? Is excess treble a "sugar fix" for some folk? Let me go on record as rejecting all forms of hot, sizzly treble on musical grounds. I'm unimpressed with Kevlar or any other plastic dome that breaks up in the audible bandwidth. In the name of high-end audio, we should be able to do better than that.

Will the real Aria please stand up?

The gap in performance between the two samples of the Aria 5 raises a serious quality-control issue. Which sound quality can you expect? Being a kit, the drivers and crossover parts or boards you receive are not likely to have undergone any testing or matching. Will your Aria be sonically behind door #1 or #2? Certainly, the improved bass detailing could be explained on the basis of the second sample's better cabinet. The maple enclosures are available for a premium of about $100 compared with the

I believe bad digital sound is also reforming the sonic tastes of listeners. I've talked to so many who was rhapsodic re: the "wonderful brightness!" of CDs.

—RL
standard MDF offering, and many speaker builders would opt to build their own cabinets anyhow. But what about the sweeter mids and smoother lower treble elicited by pair #2? Here one would have to point a finger at possible driver differences, internal wiring and crossover part choices, and crossover component tolerances. The care with which the crossover components are matched for tolerance is important—especially for complex networks. Rarely are caps and coils sold off the shelf better than ±10%. For fourth-order networks it is critical to match components to at least 5%. I would imagine that suppliers would be reluctant to do so themselves, and that this task will fall on the kit-builder’s shoulders.

It should be realized that although its builder saves a considerable amount of money; any kit-building project presents inherent quality-control problems, some of which may be beyond the average builder’s ability to solve. This is a risk you’d better be prepared to take. This caveat can be leveled at any advertised kit. I would hope that fully tested crossover boards would at least be available from Focal America.

Summary
To label the Aria 5 a sonic mixed bag would really fail to capture the true flavor of this design. It’s more a case of an otherwise excellent speaker with a significant fault: a Mona Lisa with too big a nose. The ultimate question to ask yourself about the Aria is: can you focus on its smile without being distracted by what I feel to be a blemish in its balance?

There’s no question that the design succeeds in serving up exceptionally fine imaging within a spacious and highly transparent soundstage. Hall ambience is clearly resolved, and image outlines are floated within the soundstage with almost palpable focus. The midrange is sweet and detailed, and eminently capable of communicating the joy of music. That this is accomplished without sacrificing an authentic tonal balance through the power range of the orchestra is all the more amazing. I can’t think of anything else under $1000 that can touch the Aria’s strong suits.

If only that T90K tweeter could fly! As things stand, it sinks the ship for me. The bright, sizzly treble balance is bad enough. But couple that with a grainy textural quality, and you have a tweeter that I would not let into my house.

There’s a lot of potential lurking within the confines of the Aria 5. With a soft-toned tube amp and an extreme off-axis listening seat, it’s possible that many out there could learn to coexist with the Aria’s treble. Personally, I would very much welcome a second iteration of the Aria 5 sans the Kevlar dome.

MISSION CYRUS FM/AM TUNER

Don Scott


The latest Cyrus tuner is a fully remote-controlled, refined version of the earlier manual Cyrus 1 introduced at the 1985 Winter CES and reviewed 17 months later in Vol.9 No.5. This review evolved from the assumption that manufacturing nearly the same product for five years should sprout increased user benefits and improved performance.

Mission intends the Cyrus tuner to be armchair-operated. There are no user controls on the front panel except for power on/off. (Therefore, don’t lose the remote, and pray for its continued good health!) However, front-panel display functions are not sparse, and quite comprehensive: signal strength bargraph, AM or FM, 4- or 5-digit frequency display with frequency units, channel preset digits, locked-to-station, Mono/Stereo, Manual tuning, a small circular Mute On indicator (Stereo indicator is also extinguished; the Mute indicator also

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serves for remote command-received confirmation), and volume level over a 7.5 dB range in 1.25 dB increments that can be put into memory with each preset (a good feature because station loudness varies widely). All illumination was green on the tested unit, although some units will have a partially red display. The entire display can be turned off to lessen power-supply loading and possible audio interference. (A slight lowering of distortion was noted on a few stations, none on others.) The small remote (1 7/8” by 6 5/16”) has 22 keys and uses 2 AAA cells.

Absent is the warp-prone plastic case of the earlier Cyrus tuner. The new tuner features a magnesium diecast chassis, an aluminum diecast cover and front, and a rock-hard gray finish. Interior construction is first-class, with glass-epoxy display and main circuit boards. Three separate power supplies, common to one large toroidal transformer, are used to isolate RF, audio, and digital circuits and effectively minimize noise. The rear stepped panel contains RCA audio jacks, a non-US standard FM antenna jack (a threaded F-type is best for products sold in North America), an AM loop antenna jack and mount, and a three-prong AC jack for the separate power cord.

The instruction manual is adequate, but my advice is to read it several times before operating the tuner. Unless this is done, undue frustration will result and the tuner’s many computerized functions will not be understood or appreciated. My recommendation is to enter several presets manually or automatically at the first time of operation. This will allow scan functions and preset selection to be more easily comprehended. Basically, the tuner operates in two modes, Preset and Program, and other functions trickle down from each. A unique feature is that stations can be selected by punching in the station frequency directly, by preset scan, selecting programmed presets, or by manual or automatic tuning. The tuner powers-up at the first preset and has no last station memory unless turned off by the remote (which puts the tuner in standby mode rather than cutting off the mains).

RF performance
The obvious questions to be answered with a tuner sporting 59 FM and 59 AM presets are, will it receive more than 10 stations, and are there 118 stations worth listening to? Well, Yes to the first, No to the second. Of the 100+ FM stations available at my test location near Hartford, CT, the Cyrus was able to receive 70 clearly. The remaining 30 were absent or splattered not because of signal strength, but because they require a super-selective tuner such as the Denon TU-800, H/K Citation 23, or the factory-upgraded Magnum Dynalab tuners. The Cyrus is still quite selective, but has a compromised IF bandwidth because of its single-selectivity design.

In terms of raw sensitivity, the Cyrus equals
other very sensitive tuners: Luxman T-117, Magnum Dynalab Etude, Proton AT-670, Revox B260-S, and the Technics ST-G.7. In the Auto Program mode, the Cyrus selected 27 stations with near-perfect quieting using a typical pair of rabbit ears. This is an indication that it should do well in apartment buildings.

SCA birdies were slight (none would be ideal), but not enough to be annoying unless a station has 67kHz and 91kHz subcarriers or FMX. No trace of overload was noted with strong signals, and image rejection was 80dB. Tuning is in 50kHz increments, which serves no earthly purpose with North American 200kHz station spacing.

FM sound quality
Stereo separation measured 50dB at 1kHz and decreased to 35dB at 10kHz on strong signals. While not mind-boggling, this gives impressive stereo even on weak stereo stations thanks to a very effective sliding high-blend. Only the weakest stations below 10µV/25.20dBf beg for a push of the mono button to lessen noise. The high-blend is also very efficient in minimizing the effects of fading signals because it works over a wide range of signal strengths. Bass response is slightly lean below 80Hz, but remains tight and punchy. Above 80Hz response is ruler-flat with a slight rise above 10kHz, which may be a manufacturing compromise between North America’s 75µs and other countries’ 50µs de-emphasis. In most cases the slight rise is a plus, proving complimentary to the dulling effect of the high blend. Overall, the Cyrus’s audio is good except for slight transistor grit. My best guess is that this is caused by the electronic volume control; distortion does vary with output level and is least at 0dB and −1.25dB static settings. Also, the somewhat narrow IF bandpass does stifle the best from the few quality stations.

But... one of my favorite arguments applies to this tuner: “If tuner B gets twice the number of stations with reasonably palatable audio as Tuner A, which gets fewer with better sound quality, B is probably the better tuner for the typical purchaser: one can not argue that one tuner sounds better than another on a particular station if one of the tuners will not get a desired station.” And besides, the FCC rule is that the weakest, hardest-to-get stations have the best music. The Cyrus is a B tuner; at least on FM.

AM section
The Mission may be an accomplished performer on FM, but not on AM; consider the 59 AM presets on this tuner excess electronic baggage. The sample provided did not meet its claimed 300µV/m specification by a two-fold margin, receiving only three strong stations without excessive noise. Unlike the earlier Cyrus tuner, no external AM antenna terminal is provided, which would undoubtedly aid reception in electrically quiet locations. What few stations could be received with the loop antenna sounded crisp and low in distortion. It may be possible that the review sample was defective. However, it is my opinion that the AM problem is a design flaw—evidently more attention was paid to FM than to AM performance. In contrast, the best AM on recently tested tuners was from the Citation 23 tuner, which has good FM RF performance, but lacks the Cyrus’s excellent noise reduction. It seems the consumer cannot have the best of everything in one tuner.

Summary
It’s apparent that the Cyrus tuner was not designed for those who desire the bare necessities: an on/off switch, tuning knob, and mono/stereo selector. It will appeal to those who favor computer-aided electronics. To this group I highly recommend the latest Mission Cyrus tuner, provided good AM reception is not needed. For those who desire simplicity and don’t need AM, recent Magnum Dynalab tuners are good alternatives.

Appendix
Ancillary equipment used for listening evaluation consisted of: Krell KST-100, Marantz Model 5s (8417 tubes), and Adcom GFA-535 power amplifiers; home-brew passive linestage, AudioSource Pre-One, and B&K PRO-10mm (modified by Sound Unlimited) preamplifiers; Amrita Monitors (with 5.5kHz crossover) and home-brew, 11-driver systems; Barcus Berry 2002R processor; AudioSource EQ Eight equalizer.

Tuners mentioned in this review: H/K Citation 23 ($699), reviewed in Vol.10 No.6; Proton AT-670 ($400), Vol.13 No.7; Revox B260-S ($2500), Vol.13 No.4 (LG); Magnum Dynalab FT-101 upgrade (see “Follow-Up”); Luxman T-117 ($600), Vol.11 No.2.

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THE ART OF THE INEXPENSIVE LOUDSPEAKER

Robert Harley listens to the Mission Cyrus 782, the Fried Q/4, the Triad System Seven, and Camber 3.5ti loudspeakers


During the late '70s and early '80s, I worked my way through college by selling hi-fi, or more precisely, mid-fi. During those years, I heard and sold several hundred different loudspeakers under $1000. Despite the fact that I experienced them under less than ideal conditions, I was nevertheless able to get a feel for their relative performance. When switching between speakers, the differences between them were drastically juxtaposed. No two loudspeakers sounded even remotely similar tonally, indicating that they all had severe colorations.

After spending the past two months listening to loudspeakers priced similarly to the ones I used to sell, I've developed a renewed appreciation for just how much progress has been
made in loudspeaker design in the past ten years. Where inexpensive speakers used to have distinct midrange colorations that gave all music played through them a common tonal signature, unique to each speaker, the seven pair of loudspeakers reviewed in this and the last issue all have one thing in common: a relatively coloration-free midrange. Although they do have different tonal signatures, vary in their ability to resolve spatial detail, and have their own strengths and weaknesses, none of them is severely colored to the point that you wouldn't want to listen to music through them. This is most likely the result of both the dramatic improvement in raw drivers and the development of sophisticated measurement techniques over the last decade. Even the smallest speaker manufacturer can now afford a MLSSA system, whose capabilities cost several orders of magnitude more money just a few years ago.

Review context
Last month I reviewed three low-cost two-way loudspeakers (Tannoy E-11, Dana Audio Model 1, and the NHT 1.3), and was surprised by the overall high level of musicality they offered at their modest prices. In this review, I'll take a look at four somewhat more expensive, more ambitious products.

The reference system used to audition the four loudspeakers reviewed here includes the VTL 225W Deluxe monoblock and Krell KSA 200 amplifiers, driven by a Theta DSPro Basic digital processor through the passive Electronic Visionary Systems Stepped Attenuator. The analog front end was a Well-Tempered Turntable and arm fitted with a Sumiko Boron vdH cartridge. Phono preamplification was provided by the Precision Audio outboard phono module, connected to the passive attenuator. The phono preamp has enough gain for the moving-coil Sumiko and is able to drive the amplifiers through 20' of interconnects. A 1m pair of AudioQuest Lapis connected the Theta to the EVS Stepped Attenuator, and the power amplifiers were connected by a 20' pair of Lapis. Cable between the Well-Tempered phono preamp/stepped attenuator was provided by Music Metre interconnect. Speaker cable was 3' runs of bi-wired AudioQuest Clear Hyperlitz or 10' runs of bi-wired AudioQuest Green Hyperlitz. The VTLs' monoblock construction enabled the use of the shorter cable, while the Krell required the 10' speaker-cable runs. The Phantom Acoustics Shadows, an active low-frequency room-control system, were turned off during the auditioning.

Mission Cyrus 782: $900/pair
Cyrus is the name given to the higher-priced line of loudspeakers made by England's Mission Electronics. The entire Mission loudspeaker line includes six products under the Mission label and three under Cyrus. Mission also manufactures a wide range of electronics and CD players. The company has a long history of audio innovations, both in loudspeaker and electronic design. Among Mission's claimed "firsts" are the first polypropylene drive-unit used in a product (1978), first widespread use of MDF loudspeaker enclosures (1981), and first CD player from a specialist manufacturer. Interestingly, Mission also makes IBM-compatible personal computers.

The Cyrus 782 is a two-way design employing dual 7" (175mm) polypropylene-cone woofers and a single $\frac{2}{3}$" (19mm) fabric-dome tweeter. The drivers are arranged in a D'Apolito configuration to simulate point-source radiation characteristics. Both woofer and tweeter were designed from scratch by Mission. The polypropylene woofer cones include a "mineral loading" that reportedly increases

Mission Cyrus 782 loudspeaker
cone rigidity, thus decreasing cone breakup. Additional woofer design features include a shaped pole piece to increase linearity during high cone excursions, rigid steel chassis to reduce driver resonances, and a tight tolerance between the voice-coil and magnet to increase sensitivity. The woofers are driven in parallel, which reportedly increases the low-frequency drive surface while maintaining good transient ability, high power handling, and even off-axis response. The fabric-dome tweeter is ferrofluid-cooled and -damped, and is said to be immune to the breakup modes associated with fabric domes.

A six-element crossover, with second-order (12dB/octave) filters and a 3.2kHz nominal frequency, divides the frequency spectrum. The hard-wired network features polyester and ALCAP capacitors along with air-core inductors. A split-network is used to allow bi-wire and bi-amp capability. The 782's enclosure is made from 3/4" high-density particleboard, while the front baffle is 1" MDF for greater rigidity. Side-to-side bracing reduces cabinet vibration and thus the enclosure's contribution to the reproduced sound. In addition to the Cyrus 782's cabinet bracing, the inside walls are "visco-elastically" damped with bitumen rubber pads to increase their resonance resistance. Additional damping is achieved with polyester fiber wadding.

There is a current trend toward making dynamic loudspeaker enclosures more rigid, isolating the sound of the drivers from the enclosure. Several successful designs (notably the Hales System Two Signature, Wilson WATTs, and the Avalon Eclipse and Ascent) have paid considerable attention (and build cost) to minimizing enclosure vibrations. Since the acoustic output of a vibrating surface is a function of its size and excursion, it doesn't take much movement by the relatively large cabinet panels to add significantly to the energy launched into the room by the loudspeaker system. The cabinet's contribution not only colors the signal spectrally, but adds a time smear as the enclosure's energy is released slightly later than the energy produced by the drivers.

Achieving good time-domain performance was a high priority in the 782's design. Low-frequency alignment was optimized for good transient ability, and the contribution of delayed resonances (by cones, cabinets, driver baskets) was considered in both raw driver design and the finished loudspeaker.

The Cyrus 782 is very attractive, with beautiful cabinet construction, solid build, and close attention to fit and finish. However, I had one quibble with the 782s: their binding-post arrangement. Inside the usual recessed terminal cup, the two pairs of five-way binding posts are set in from the cup about 3/8". This made it very difficult to tighten the connectors on thick cable like the AudioQuest Clear and Green Hyperlitzes unless the entire spade lug was completely inside the very small inset area that actually holds the posts. If you don't get the spade lug completely away from the inset ridge, tightening the binding post bends the lug and makes for a loose connection. With some effort, however, I was able to angle the cables so that the lugs were not forced to bend when tightening the posts.

For most listeners, this will be a minor inconvenience since they are not likely to connect and disconnect them as often as I did during the review; and AudioQuest Clear is among the heaviest of speaker cables.

**Listening:** All the auditioning was performed on the Cyrus stands, available for an additional $150. The stands placed the tweeter about 6" below my ears' axis when seated in my listening chair. This is somewhat lower than I'm accustomed to, but is apparently a purposeful design decision. The stands are quite sturdy and made from heavy tubular steel. The “T”-shaped bottom support has threads for inserting three carpet-piercing spikes, while the top plate can be fitted with similar but shorter spikes that slightly penetrate the loudspeaker bottom. On the advice of Mission's Mark McDonald, I opted for spikes on top and bottom for best performance. He also indicated that due to the 782's lowish impedance, they work well when driven by the Krell KSA-200 amplifier. For the auditioning, I removed the grilles, which consisted of a black fabric stretched across a lightweight plastic frame.

The 782s were broken in for about a day before any serious listening. For part of the break-in period I played the Dorian organ CD of *Pictures at an Exhibition* (Dorian DOR-90117) on "Repeat" mode while away for the day. After returning home, I realized that Winifred, our Miniature Pinscher, had been subjected to six hours of this, although through a closed door. She probably still hears "The
Great Gate at Kiev" in her sleep! After the 782s were broken in, I tightened the hex bolts that hold the woofers in place about a quarter turn, in accordance with the instructions. Mission supplies a hex wrench for this purpose.

After some experimentation, I found the 782s performed their best about 36" from the side walls, 50" from the rear wall. Although the 782s are designed to point straight ahead, I preferred the slightly more forward midband presentation and tighter instrumental focus with them toed-in a few degrees.

The first thing that impressed me about the 782s was their smooth, silky midrange and the absence of aggressive treble so often heard from loudspeakers. I immediately suspected that I would enjoy the 782s. Next to midrange colorations that impart unnatural timbres to instruments and voices, I find an overly bright treble presentation to be the most annoying characteristic of many loudspeakers, especially inexpensive ones. It was a pleasant surprise to discover that the 782s had a smooth, natural treble balance that didn't offend the ears.

The 782's overall tonal character was surprisingly similar to that of the $4850 Hales System Two Signature, which is, in a word, neutral. Instrumental timbres were natural and realistic, without any glaring colorations that drew one's attention away from the music and toward the loudspeaker. In fact, the words "smooth," "neutral," "uncolored," and "liquid" were often the first impressions written down in my listening notes next to each piece of music used to audition the 782s.

For example, the Bösendorfer on Dick Hyman Plays Fats Waller (Reference Recordings RR-33CD) was reproduced with an open, lively quality, but without the clangy or tinkly rendering that plagues overly bright speakers when reproducing this recording. I had an opportunity to hear the real instrument at length during the recording of this disc, and felt that the 782s did a credible job of conveying its true sound. The midrange was pure, clean, and without congestion or confusion, even during the complex passages of the opening tune, "Bach Up To Me." The bass was very quick and agile, with the ability to convey the rhythmic bounce essential to this music. Although low frequencies were tight and well-controlled, there was a sense of leanness through the mid/upper bass that resulted in some loss of the Bösendorfer's weight and body.

Besides the freedom from tonal aberration, I was also struck by the exceptionally detailed midrange. The piano's wealth of subtle detail emerged in a finely woven rendering that made the presentation musically involving. Nuance that is obscured through other loudspeakers came to life through the 782s. It seemed that there was just more information about the instrument and the music being conveyed to the listener.

Moving on to other recordings, I found my initial impressions of the 782s largely confirmed. The textures presented by the 782s were never hard, edgy, or annoying. This is an important aspect of music reproduction. There was a certain liquidity to the rendering that drew one into the music. Conte Candoli's flügelhorn on a recording I engineered was smooth and round. It's easy for a loudspeaker to introduce glare and hardness to this instrument, but through the 782s it retained its round, liquid warmth. Incidentally, it was recorded with a tube microphone (Telefunken 251) and a tube compressor (a vintage UREI LA2A).

Female vocal (Dianne Reeves on David Benoit's album 'Tbis Side Up, ENP 0001) had a particularly enjoyable quality that was silky, laid-back, and devoid of harsh sibilance. However, the voice seemed somewhat thin and lacked body through the lower midrange. It sounded as though there was no chest attached to her voice. Listening to other instruments with substantial energy in this range corroborated these impressions. Acoustic bass had a somewhat threadbare rendering through most of its range, though not in its lowermost registers. The weight of orchestral climaxes was missing, robbing the music of its power and impact. Overall, the bass rendering was taut and articulate, the antithesis of tubby and bloated. Generally, I prefer this type of bass presentation to an underdamped, loose bass, but I felt the 782s erred in the direction of favoring quality over quantity. I must add, however, that the 782s had remarkable agility, speed, and detail in the bass. LF transients, bass drum in particular, were sharp, punchy, and free from the overhang that often obscures the instrument's dynamic envelope. One other LF characteristic I detected was an apparent resonance that could be heard occasionally on acoustic bass. The frequency was much lower than the typical resonant coloration that makes...
a vocal sound boomy or heavy. Instead, the resonance was seldom excited, and then only by very-low-frequency notes, indicating the resonance was fairly narrow-band. Although I didn't hear it often, it was apparent over a wide range of recordings, suggesting it was probably a loudspeaker artifact. In addition, the 782s seemed to lack the LF extension heard from the other three loudspeakers in this review.

Going back to the 782's strengths, the speaker excelled in presenting a recording's dynamic contrasts and transient information. Transient leading edges were clean and razor-sharp, conveying a sense of immediacy and involvement, though not at the expense of fatiguing the listener. I was able to spend long sessions with the 782s and still find myself wanting to continue listening. This is always an important sign that the product is fundamentally right. In addition to presenting musical attacks with speed and precision, the sense of dynamic contrast was further heightened by the 782's ability to render subtle instrumental detail. Low-level information was clearly resolved without being hyped. These qualities combined to imbue music reproduced through the 782s with a sense of dynamic effortlessness and ease.

Soundstage presentation was similarly excellent. The 782s could throw a convincing soundstage in front of me as well as a fair sense of depth. Just as important was the precise and realistic portrayal of image size within the soundstage. Instrumental outlines were never bloated or diffuse. Instead, I was able to see the instruments before me in a precise position in space, distinct from neighboring instruments and unattached to the loudspeakers. The 782s' ability to present images laterally was better than their ability to convey the depth I know exists on some recordings. There was not the feeling of expansive three-dimensional envelopment experienced with some (albeit more expensive) loudspeakers. However, I must still give high marks to the 782s' soundstage presentation: they could throw pinpoint images away from the loudspeaker boundaries and, all things considered, were musically satisfying from a spatial perspective.

The 782s performed well over a wide variety of music. From early orchestral music (Handel's Water Music, Harmonia Mundi 907010) to high-energy rock and roll (The Dixie Dregs' Dregs of the Earth, Arista ARCD-8116) to full-scale orchestral music (Bruckner's Symphony 7, Telarc CD-80188), they were up to the task of conveying the music to the listener.

**Measurements:** Starting with the Listening Environment Diagnostic Recording (LEDR) on the Chesky Test CD, I found the 782s did quite well on the "Up" test, the most difficult for a loudspeaker. The image clearly moved up from the loudspeaker, but flattened at the top into a "J" shape. Ceiling reflections could account for this, however. The "Over" test was similarly good, the 782s producing a solid "rainbow"-shaped image path between the two loudspeakers. The third LEDR test, "Lateral," was handled well by the 782s. They created precise, well-defined images at all points between the loudspeakers. (Incidentally, I highly recommend this recording for evaluating and tweaking your listening room and for achieving optimum loudspeaker placement.)

Driving the 782s with a variable-frequency sinewave oscillator revealed that the 782's enclosure is remarkably inert and well-damped. I could detect only one frequency—340Hz—where the cabinet vibration became audible. Below this frequency, no cabinet resonances could be felt or heard. This is excellent performance.

Looking at fig.1, the 782's impedance magnitude (solid line) and phase angle (dotted line), we can see the sealed-box tuning with the impedance peak at 65Hz. The impedance is fairly low through most of the spectrum, dropping below four ohms in the upper bass. An amplifier with the ability to drive current into lowish impedances is therefore recommended.

Fig.2 shows the 782's FFT-derived anechoic frequency response spatially averaged over a 30° lateral window on the tweeter axis. The
nearfield woofer response, measured with the Audio Precision System One and appended to the MLSSA data, is plotted to the graph's left-hand side. The response is fairly flat, but with a rise in upper-octave energy and some midrange anomalies at 5 and 7kHz. Notice also the droop in extreme treble. From the auditioning, I would have predicted a smoother curve than this. However, the Mission stands placed my ears 6" above the tweeter axis, which could account for a smoother treble perception during the auditioning.

Moving to the time domain, the 782's impulse response is shown in fig.3. The fact that a second-order crossover is used is evident from the slight "hump" of energy in the decay. The impulse response is quite clean, with just a little ringing. Fig.4 shows the Cyrus 782's Cumulative Spectral Decay, or "waterfall," plot. This is the loudspeaker's frequency response calculated at discrete time intervals after the speaker is excited by a rectangular pulse. The 782's plot is excellent: the treble energy dies away very quickly and there are few ridges along the time axis that would indicate a smearing of the signal. The dark ridge near 16kHz is the computer monitor's scanning frequency and not part of the loudspeaker response, while the adjacent ridge appears to be a tweeter resonance, but is above audibility.

**Conclusion:** The Mission Cyrus 782 is a remarkable loudspeaker for $900. It offers a level of musical performance one doesn't normally associate with a pair of loudspeakers costing under a thousand dollars. In particular, I was impressed by the 782's tonal smoothness and freedom from midrange coloration, a fundamental prerequisite for musical satisfaction. Instrumental timbres were always natural, with little imposition of the loudspeaker to obscure an instrument's subtle tonal shadings. The 782's treble was similarly enjoyable. It was soft and sweet, but not at the expense of openness or detail. Instruments and voices sounded harmonically correct, without the unnatural, steely sheen often heard from loudspeakers. Another area where the 782 excels is in its ability to present transient detail with sudden...
attack and equally sudden decay. This characteristic allowed important dynamic information to emerge, giving music an "up," exciting feeling. In addition, I found the 782s provided a wealth of musical detail, especially in the midrange.

On the down side, the 782s had a leaness through a wide region that encompassed the mid/upper bass, reducing the feeling of body and warmth. Although vocals were free from a resonant chestiness, they lacked the feeling of an attached body.

The 782s have a strong sonic resemblance to the Hales System Two Signature, the loudspeaker that has become my reference. Both have a fundamentally uncolored tonal balance, ability to resolve detail, good transient characteristics, and presentation of tight, focused images. Interestingly, they share a common weakness in the overdamped, lean bass rendering, but with the 782s having a greater deficiency in this regard. No, the 782s don't have the degree of resolution, tonal purity, and transparency of the Hales Signatures, but it is significant that this $900 loudspeaker has more than a little in common with the Class A reference. The differences between them tended to be quantitative rather than qualitative. Throughout the auditioning, I felt that the 782s conveyed the music to me. They were always musically satisfying and never a chore to listen to. In addition to their superb musicality, the 782s are well-made and very attractive. The stands are well-designed and should be considered mandatory.

As you might have guessed, the 782s have earned a well-deserved recommendation.

**Fried Q/4: $449/pair**

I first heard the Fried Q/4 at the Chicago CES last June. I was favorably impressed and asked Irving (Bud) Fried to send a sample pair. The Fried Q/4 is a major revision of the popular Q/3 loudspeaker, incorporating many design refinements over the previous model. Bud Fried is a long-time proponent of transmission-line loading (see "Manufacturers' Comments," Vol.13 No.4, p.243) and bases his designs on what he strongly feels is far and away the best type of driver loading. The Q/4 uses a variation on the transmission line called the "Line Tunnel," a large duct from the inside of the enclosure that vents at the cabinet bottom, the aperture running the width of the enclosure.

The line tunnel is neither a true transmission line nor a reflex system but a hybrid of the two, according to Mr. Fried. Computer modeling was used to determine the best line damping for optimum bass performance. The line tunnel is said to effectively double the low-frequency radiating area while maintaining good transient ability, relieving internal pressure, and damping the low/mid-frequency driver. In addition, this loading is said to result in a gradual bass rolloff similar to that of a sealed enclosure (12dB/octave) rather than the more rapid rolloff typical of a reflex system.

The 8", two-way design is based on a polypropylene-cone woofer with an unusual "fillet" joint between the cone and surround. This irregularly shaped bond reportedly reduces and breaks up reflections to the voice-coil while reducing cone breakup and improving midrange detail and imaging. The custom-made woofer also features a Fried-developed vented pole-piece arrangement that results in more linear driver behavior. A 1" fluid-damped fabric-dome tweeter is mounted symmetrically.
above the woofer. Like the woofer, the tweeter is custom-made for Fried and sports the Fried name below the dome.

Crossover frequency is 3kHz, typical of 8" two-way systems. The computer-derived crossover features impedance compensation for each driver and variable slopes for better transition between drivers. Fried claims that the crossover point is undetectable by either ear or laboratory measurement. A thermistor protection circuit protects the drivers from overload. The Q/4s never shut off during the auditioning, even after extended periods at high playback levels.

Overall, the Fried Q/4 is well-built, sturdy, and appears to incorporate several design innovations for an inexpensive product. Its appearance is typical of an 8" two-way box loudspeaker. I'm not a fan of walnut vinyl veneer, but the speaker is also available in "black ash" vinyl.

Listening: The Q/4s were placed on the double-spiked Mission stands, and after some placement experimentation I settled on a little wider spread than the other loudspeakers under review.

What immediately impressed me about the Q/4 was its smooth tonal balance, especially the lack of an aggressive treble. So many loudspeakers err on the side of too much treble energy, either because it suits the designer's taste or a little zip in the top end is perceived as a marketing advantage. Not so with the Q/4s: their treble balance was right on the money—lively and detailed without being forward or pushy. This polite treble character made music unfatiguing and enjoyable during auditioning.

The treble smoothness was complemented by an open, unboxy quality through the midrange. Vocals were slightly laid-back and silky-smooth. The mids were quite uncolored, with natural timbres. I did detect a slight nasality to sax (Scott Kreitzer's 'Kick'n Off, Cexton CR-11264), but it was minor in relation to the Q/4's excellent midrange and treble presentation. The acoustic guitar from the Stereophile Test CD (track 12) was reproduced with a timbre very close to what I remember during the recording. The treble did have just a bit of fabric-dome tizz, but I was not annoyed by it. Indeed, the Q/4's treble presentation was welcome during the long auditioning involved in reviewing four pairs of loudspeakers. The Q/4s were unfatiguing and musical through the mids and treble, quite an accomplishment for a $490 pair of loudspeakers.

I found the Q/4s to be less detailed than the other loudspeakers under review, but this was to be expected given the Q/4's smooth, laid-back presentation. I much prefer a more natural spectral balance to a zippy and hyped presentation. The highly detailed rendering may sell speakers in the dealer's showroom, but wears thin quickly when trying to enjoy music through them. The Q/4s did, however, present less inner musical information through the midrange compared to the other speakers reviewed here. There was not quite the sense of involvement heard through the Cyrus 782s, due in large part to the 782's wealth of inner detail. Remember, though, the Q/4s are about half the price of the 782s.

The Q/4's low-frequency presentation was surprisingly full, deep, and powerful for such a small cabinet. They could produce low frequencies without a sense of strain. The pedal tones in the Dorian Pictures at an Exhibition recording were solid and full-bodied. After being surprised by the Q/4's prodigious LF output, I played this recording at very high levels. The Q/4s hung in there well past the point of a normal listening level.

I did, however, have a few complaints about the bass. It tended to be underdamped, creating a "rolling" character rather than an agile, tight quality. Where I had thought the 782s, to their detriment, sacrificed bass warmth for transient speed and articulation, the Q/4s erred in the other direction. The overripe low end tended to obscure bass detail, while imparting a "slow" character. A lot of the music I like happens to feature virtuoso bass players (Stanley Clarke, Eddie Gomez, John Patitucci, Jaco Pastorius). Their speed and agility challenge the loudspeaker to keep up with them without smearing the notes together. I found the Q/4s adept at producing sustained low frequencies, but less satisfying at resolving lower-register detail and rapidly shifting pitch. One other aspect of the bass that disturbed me was an apparent resonance that manifested as a wooden quality in acoustic bass mid-registers and low-tuned toms (especially floor toms). I don't know how wide the resonance is, but have reason to believe it is moderately so because notes near the peak frequency that really excited it were "pulled" in pitch. On the
other hand, the resonance was excited fairly infrequently, indicating a narrow-band, high-Q peak. I suspect that the line tunnel's output may contribute excessive energy in this range.

The Q/4s produced a credible soundstage, with images between and detached from the loudspeakers. In fact, I was able to position them farther apart without losing a strong center image, creating a wider soundstage than normal. However, instrumental outlines tended to be less focused than those heard through the Camber 3.5ti, Cyrus 782, and Triad System Seven. Rather than being tight and precise, images were less well-anchored within the soundstage. Similarly, the soundstage didn't have the depth and spaciousness rendered by the other loudspeakers under review. Again, the reader should be reminded of the Q/4's much lower price compared with the other loudspeakers auditioned.

Measurements: The LEDR "Up" test produced a fairly good sense of height above the loudspeaker, but stopped short of the height heard through the many other loudspeakers. The "Over" test was better, the "Lateral" excellent. The Q/4 exhibited minor cabinet resonances at 100Hz and 120Hz, and a fairly strong mode at 260Hz that produced a buzzing from the enclosure. The Q/4's impedance magnitude and phase angle are shown in fig.5. The single impedance peak at 70Hz is more typical of a sealed-box tuning. Note also the slight dip at the cabinet buzz frequency, 260Hz. (A much finer analysis would be required, however, for this cabinet problem to be fully revealed in this plot.) The impedance drops to 5 ohms through most of the bass, rises near the crossover frequency, then drops sharply to 4 ohms through the top octave. A 6 ohm or even 4 ohm rating would seem more appropriate than the specified 8 ohm impedance.

The Q/4's impulse response (fig.6) is quite clean, with very little ringing or overhang. The Q/4's FFT-derived frequency response, spatially averaged over a 30° lateral window and measured on the HF axis, is shown in fig.7. The response is quite flat, with less rise in the treble than the other three loudspeakers reviewed. Although smooth through the midband and treble, there is a peak centered at about 3kHz, which might contribute to the slight nasal coloration noted. This, however, is greatly reduced 15° off-axis. At this angle, the treble also rolls off rapidly above 15kHz. The Q/4's nearfield woofer, measured separately with the Audio Precision System One, has been appended to the spatially averaged frequency response. Curiously, the line-tunnel output in the nearfield (not shown) is virtually identical to the woofer's output shown. Typically, a port is tuned to augment bass output below the woofer's rolloff (see the Camber 3.5ti's nearfield woofer and port plots). It appears that the line tunnel does indeed reinforce the woofer's output rather than providing LF extension.

Finally, the Q/4's Cumulative Spectral Decay is shown in fig.8. The 3kHz peak is apparent and is accompanied by a minor ridge of delayed energy. Overall, the Q/4's waterfall plot is very clean through the treble. The dark line
at 16kHz is the computer monitor's scanning frequency, not a loudspeaker characteristic. These measurements are, overall, good for an inexpensive loudspeaker.

**Conclusion:** At $490/pair, the Fried Q/4 delivered a consistently high level of musicality for its price. Its smooth tonal balance and uncolored presentation through the mids and treble were the speaker's greatest strengths. The treble didn't have the hardness and glare endemic in inexpensive tweeters often found in loudspeakers at this price. Music was never fatiguing or annoying, and I enjoyed listening to the Q/4s throughout the auditioning. It also has the ability to deliver low frequencies without the "anemic" quality one hears from small box speakers. Both LF extension and sense of weight and power through the midbass were remarkable.

My complaints tended to be less important musically than the Q/4's strengths, and should be put into perspective by the under-$500 price tag. These include a somewhat sluggish bass and a resonant LF peak that unnaturally colored instruments with energy in that range, while giving low-tuned drums a "fat" character. The Q/4s could throw a good soundstage, but the imaging lacked good focus and a real sense of depth.

The Q/4 offered a smoother treble than the three similarly priced loudspeakers reviewed last month, and far more output in the low-frequency range. However, I have yet to hear the $500 Snell K (review forthcoming), or what has become the benchmark level of performance for inexpensive loudspeakers, the Spica TC-50 (reviewed in Vol.12 No.10).

Despite the Q/4's shortcomings, I can recommend them on the basis of their very smooth mid and treble performance, coupled with an ability to deliver the kind of bass more often associated with much larger enclosures. They consistently delivered more music than one would expect from their modest price.

**Triad System Seven:**
**$1000/system**

Triad Speakers has been designing and manufacturing three-piece (woofer and two satellites) loudspeaker systems since 1982. The company was formed that year by designer Larry Pexton and has enjoyed steady growth in their market niche. Their original three-piece loudspeaker was a collaboration with Edward M. Long, of "Time-Align" fame, and Ron Wickershram. It was felt that the ideal loudspeaker would have the least cabinet interference, thus the design decision to keep the woofer separate and the midrange/tweeter enclosure small. Triad speakers were selected for inclusion in the Consumer Electronics Show's Innovations '90 Design and Engineering Showcase, the sixth time the company's products have been selected for this award.

The System Seven consists of a cubical woofer enclosure powered by an internal amplifier and two very small midrange/tweeter modules. Starting with the woofer, it is based on a 12" Peerless polypropylene-cone driver powered by a 70W amplifier. The woofer response is equalized in the amplifier front-end.

**Fig. 8** Fried Q/4, cumulative spectral-decay plot
to compensate for the 12dB/octave rolloff exhibited by sealed enclosures below the driver's resonance. The woofer's upper range is about 140Hz, and the −3dB point is specified at 28Hz. The woofer's low-pass crossover slope is 12dB/octave.

A panel on the enclosure's rear provides a woofer level-control adjustment, a pair of RCA line-level input jacks, two pairs of five-way binding posts for speaker-level inputs, power on/off switch, line cord, and a fuse. The panel also incorporates the amplifier's heatsink. The enclosure front is covered by black fabric stretched over a thin wood frame. The unit is finished in real oak veneer, with a large variety of other woods available, some at extra cost.

The midrange/tweeter module is comprised of two separate enclosures mounted one atop the other on a rubber bushing. The tweeter unit can be swiveled to accommodate different listening axes or direct more treble energy toward the listener if desired. A pair of five-way binding posts is provided on the module's midrange portion. A Scanspeak paper-cone midrange (the same driver reportedly used in the Duntech Black Knight) is coupled with a Vifa V26 soft-dome tweeter. The tweeter's front plate is small and square, rather than round, to fit inside the tweeter enclosure. The tweeter is crossed over at 6dB/octave, while the midrange is filtered at the steeper 12dB/octave slope. No high-pass filter is in the midrange circuit, the rolloff provided instead by the natural acoustical response of the driver.

Listening: The Triad System Seven is easy to set up in some ways, but very difficult to squeeze the very best performance from. I got good sound from the System Seven just by putting the satellites where I thought would be appropriate, placing the woofer on a platform just above the floor, and setting the woofer level at 11 o'clock in accordance with the instructions. Without any adjustments, tweaking, or experimentation, the imaging was superb and the tonal balance fairly good. This experience indicates that most users will get satisfactory sound from the System Seven without much effort. However, as I tried to find the optimum setup, I soon realized that this would be a major undertaking. The System Seven has so many variables that one could spend weeks getting it just right. These variables include woofer placement (including the height axis), woofer output level, satellite placement, midrange driver toe-in, tweeter toe-in, listening height, and listening position in the room. In addition, many of these variables are interactive, further complicating the situation. For example, the optimum woofer level is dependent on midrange and treble energy which is dependent on amount of satellite toe-in.

I must stress that it is easy to get good sound from the System Seven without all this tweaking, as evidenced by my initial setup. But as a reviewer, it is important to wring from a loudspeaker the very best performance it has to offer to make accurate and informed value judgments. I should add that this was my first experience with a powered woofer system.

Most of the auditioning was done with the woofer located midway between the satellites.
and mounted on a double-spiked Mission stand. Getting the woofer away from the floor and other boundaries is essential: The tendency for the woofer to have a boomy character was ameliorated by the free-space positioning. I found the recommended 11 o'clock position of the woofer-level adjustment very close to optimum, but a little high. More on this later. The satellites were positioned 55” from the rear wall and 32” from the side walls, with the midrange drivers slightly toed-in. The tweeters were rotated to point straight ahead. Because my 3' runs of AudioQuest Clear Hyperlitz wouldn't reach both woofer and satellites, I auditioned the System Seven with 10' runs of AudioQuest Green Hyperlitz.

During the auditioning, I was torn by my ambivalent feelings toward the System Seven. In some aspects, it achieves a level of performance that rivals Class A loudspeakers. It also has weaknesses that compromise the overall musical performance of the system. This situation makes it very difficult to judge the product, especially because different listeners have different sonic priorities. Let's start with what the System Seven does well.

I was immediately taken by the System Seven's midrange purity. It produced a transparent, open, and crystal-clear rendering through the area occupied by most musical fundamentals and lower-order harmonics. This gave a natural timbre to instruments and vocals in this range. I was particularly impressed with the System Seven's reproduction of Conte Candoli's flügelhorn from a CD I had engineered. It was round, liquid, and had a texture remarkably similar to what I remember from the real instrument during the session. This recording is often reproduced with an unnatural "hooded" quality, or alternately, as steely or reedy. Through the System Seven it was warm, rich, and remarkably uncolored. I find brass instruments particularly revealing of tonal aberrations, perhaps because they have such complex harmonic structures. Not only are brass instruments sensitive to microphone differences, but there is a drastic tonal change if even a little equalization is applied.

Other instruments with mostly midrange energy were similarly impressive. Vocals were pure, smooth, and uncolored. The tonal character of the period instruments on Handel's Water Music (Harmonia Mundi HMU 907010) were reproduced with a realism and palpability that was extraordinary by any standard. In addition to the midrange smoothness, the impression of palpability was heightened by the System Seven's presentation of musical detail. Subtleties of tonal character, low-level information, and fine detail were all presented to the listener. This resulted in an involvement and interest in the music that drew one into the performance. This is an essential ingredient to musical satisfaction, and the System Seven had these attributes in spades. The System Seven had the ability to resolve the musical detail and information in a recording, and was equally adept at presenting midrange and treble transient information, fine textural detail, and resolving spatial cues. In these areas, it exceeded the performance of the Cyrus 782 and was more on a level with the $4850 Hales System Two Signature.

This brings me to the System Seven's other area of remarkable performance: soundstage, imaging, and resolving spatial nuances. The feeling of envelopment, of an expansive and deep soundstage before the listener, and of the loudspeakers disappearing into the music, was extraordinary. In addition, image focus and spatial precision within the soundstage were equally impressive. Instrumental outlines were rock-solid and resolved with pinpoint precision. Listen to Alto's drum solo on "Misturada" from Three-Way Mirror (Reference Recordings RR-24CD). Each drum is a focused image and spatially distinct from the drum next to it. Curiously, the System Seven seemed to resolve height information, with the bass drum at the bottom right, toms in the middle, and cymbals above the plane of the loudspeakers.

The System Seven produced an accurate impression of hall size, with the soundstage width and depth changing with each recording. The Dorian Pictures at an Exhibition was conveyed with a sense of space and size. My guitar and bass recording on the Stereophile Test CD took on the characteristics of the recording site (a 140-year-old church), with a feeling of air and space around the instruments. The System Seven's resolution of spatial nuance and detail was exceptional, reminiscent of the Ensemble Reference reviewed by Dick Olsher in Vol.13 No.6.

If the System Seven does all these things so well, why am I ambivalent about it? Well, it has a few of what I consider to be serious shortcomings.

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First, the tonal balance was overly bright. Cymbals assumed a forward and aggressive character that detracted from the listening experience. The bright character was evident in most recordings, but became objectionable in CDs and LPs that tended to be even slightly bright. In addition, the brightness seemed confined to the upper octaves, affecting instruments with extreme HF energy (cymbals for example) rather than adding an upper-midrange glare to a wide range of instruments. This indicates that the rising treble is probably high in frequency (above, say, 10kHz) rather than an upper-midrange rise that would affect more of the musical spectrum. I wouldn't characterize the treble as hard and brittle, like the Camber 3, Sti's, but rather as possessing excessive energy. In fact, the treble was quite clean, detailed, and free from hash. However, the elevated HF level prevented long listening sessions at moderate to high playback volumes.

Rotating the tweeter away from the listening position helped greatly, but at the expense of image focus and midrange palpability. In fact, I felt the best treble balance was obtained with the tweeters pointing away from the listening axis by about 30°. I should add that my listening room is far from bright and reflective. There are drapes over large windows on two walls, and most of the wall surface is covered by a thin carpet that is similar to a commercially available acoustic treatment material. The floor is covered by thick Berber carpeting over a heavy pad. I have large pieces of foam to cover the reflective surfaces of equipment cabinets and bookcases. In addition, the dedicated room's dimensional ratios were chosen for best distribution of room resonance modes.

My other criticism of the System Seven is significant, but not as severe as the treble imbalance: bass reproduction. I had a hard time getting the woofer to integrate with the satellites. There seemed to be a dip in the response between where the woofer rolled off and where the satellites took over. This imparted a thinness, or threadbare character to the mid/upper bass that I couldn't get rid of. Increasing the woofer level so the presentation was warm and full in the midbass caused the low bass to become thumpy. Backing off on the level so the bass boom was reduced made the midbass lean. Getting the woofer up in the air on the Mission stand helped somewhat, but was still not satisfactory. In addition, the bass tended to be a little sluggish compared to the exceptional transient performance of the satellites. Pitch definition was good, but not as clearly resolved as the Cyrus 782.

One aspect of the System Seven's low-frequency performance that the other loudspeakers in this survey couldn't approach was bass extension. While the others may have hinted at low bass, or had a suggestion of extension, the System Seven had real output in the lowermost octaves. The organ on Dorian's Pictures at an Exhibition was reproduced with a real sense of the instrument's size and weight. The lowermost fundamentals were solid and powerful, producing a more musically satisfying experience with this recording than that heard through many loudspeakers.

Despite these criticisms, I was quite taken with the System Seven's presentation. This says a lot about its fundamental rightness through the midrange, the area where most musical information lies. I intend to hang on to the System Seven to try and ameliorate some of its problems. It has the potential for achieving a level of musical performance exceeding anything else I've heard in the price range.

**Measurements:** Not surprising in light of my impressions of the System Seven's remarkable imaging abilities, they performed very well on the LEDR test. The "Up" image achieved the greatest apparent height of any loudspeaker on which I've heard this test. The image was solid as it moved up, and continued to the ceiling. The "Over" test was similarly impressive, the image tracing a clearly definable arc over the satellites. The "Lateral" test, which is the easiest for a loudspeaker to perform well, produced pinpoint and continuous images between the satellites. Driving the satellite with a variable-frequency sinewave oscillator produced a very small amount of cabinet vibration at 150Hz. The woofer enclosure was lively, with a fair degree of vibration throughout the lowermost frequencies up to about 200Hz.

Fig.9 shows the satellite's impedance magnitude and phase angle. Since the impedance is generally above 6 ohms, the System Seven should be an easy load for an amplifier to drive. The narrow impedance peak is centered on the frequency that the midrange begins rolling off.

The System Seven's frequency response, averaged over a 50° lateral window, is shown in fig.10. (The woofer's nearfield response,
measured separately, is shown to the left of the graph.) It reveals a smooth midband with a rising treble response, as suggested by the auditioning. As the measurement microphone is moved off-axis, the response flattens considerably. The sharp dip at 7kHz is greatly reduced, as is the treble energy, when measured off-axis. In addition, the amount of HF level is more in line with the rest of the spectrum off-axis, also suggested by the auditioning. The System Seven is remarkably flat through the entire midband to about 4kHz, an area where the ear is most sensitive to amplitude irregularities. The woofer response shows the System Seven’s ability to produce low frequencies and the fact that its energy output is centered around the octave from 40–80Hz. Also indicated by the measurement is the woofer’s rapid rolloff above 100Hz. It is about 10dB down at 150Hz, the very lowest frequency we could expect the satellite to produce. These measurements suggest the System Seven has a dip in the overall response between the woofer and satellites. This correlates very well with my impression of a leanness through the mid/upper bass coupled with ample output in the low bass.

Moving to the time domain, the satellite’s impulse response is shown in fig.11. The response is clean, but with a little overhang. The System Seven’s Cumulative Spectral Decay plot (fig.12) is among the best I’ve seen. It reveals a very rapid decrease of energy after the drive signal has been removed. The only evidence of any overhang is the ridge at 3kHz, but this is very minor. (The ridge at 16kHz is the computer monitor’s scanning frequency, not a loudspeaker anomaly.) Compare the System Seven’s

**Fig. 9 Triad System Seven, electrical impedance (solid line) and phase (dashed) (2 ohms/div. vertical scale)**

**Fig. 10 Triad System Seven, anechoic response averaged across 30° lateral window with nearfield LF response plotted below 300Hz**

**Fig. 11 Triad System Seven satellite, impulse response at 48° on HF axis (5 ms time window)**

**Fig. 12 Triad System Seven satellite, cumulative spectral-decay plot**

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waterfall plot with others taken over the past few months: it is among the best measured.

**Conclusion:** If this review appears a bit schizophrenic, it's because it is an accurate reflection of my impressions of the Triad System Seven. In some areas it achieves a level of performance that rivals loudspeakers costing many times as much. These areas tend to be important musically: an open and uncolored midrange, resolution of instrumental detail, and an expansive yet focused spatial presentation. In addition, the System Seven had an involving and musically interesting character that was very satisfying. In my opinion, however, its exceptional musical performance in some areas was compromised by two significant faults: an overly bright treble, and a somewhat lean midbass accompanied by a thumpy quality in the low bass. The System Seven did, however, produce remarkable LF extension, especially for a $1000 loudspeaker. Incidentally, it would be criminal to put the satellites on a bookshelf and lose the System Seven's spectacular soundstaging and midrange transparency. The $100 stands are definitely recommended.

I'm not certain that I got the best performance from the System Seven. Although experimentation did improve its strengths and somewhat mitigate its weaknesses, it may be possible to further tweak the system's many variables to ameliorate its problems.

Having said all that, can I recommend the Triad System Seven?

Yes, but with the implicit assumption that prospective buyers will carefully audition it for themselves. Some listeners may be less bothered by the forward treble presentation than I was. The bottom line is that I enjoyed listening to music through the System Seven and at times was completely immersed in its presentation. Give it a listen before buying anything in this price range.

**Camber 3.5ti: $699/pair**

Plateau Camber is a Canadian loudspeaker manufacturer which concentrates on building small, moderately priced systems. The company started as the Canadian distributor of Rega products and began making loudspeakers under the Rega/Camber name. Their products range from the $300 model .7t to the $1000, floor-standing 5.0ti. The second-from-the-top-of-the-line 3.5ti reviewed here is a completely redesigned version of the Camber 3.5 loudspeaker reviewed by JA in Vol.11 No.8. In fact, the 3.5ti is radically different from its predecessor: it uses a different woofer cone, sports a new metal-dome tweeter, has a much simpler network, and incorporates some cabinet refinements.

The 3.5ti is an 8", two-way system employing a carbon-doped polypropylene-cone woofer and a 1" metal-dome tweeter in a bass-reflex enclosure. Unusually, the 3.5ti's woofer is handmade by Camber from components sourced from around the world. It features a diecast frame and aluminum-wound voice-coil. The tweeter is a fluid-damped metal dome made by SEAS. A 2½"-diameter reflex port is mounted below the woofer. The port, woofer, and tweeter are located asymmetrically in the enclosure to disperse cabinet diffraction effects. The mirror-imaged pair is said to sound best with the tweeters toward the outside.

Camber has paid significant attention to con-
trolling cabinet resonances in their loudspeakers. The 3.5ti's ¾" particleboard enclosure is made more rigid by two braces just above and below the woofer. The center brace is slightly larger than the interior cabinet dimension, causing the enclosure to bow very slightly in the middle. This technique reportedly reduces panel motion. In addition, acoustical foam has been applied to the inside walls to further damp resonances.

The seven-element crossover is a highly damped second-order electrical network, which is said to result in third-order effective acoustical slopes in the 3.5ti. Instead of using an inductor in series with the woofer, a capacitor and resistor are wired in parallel with the woofer. This technique reportedly has the advantages of making the load much more like a pure resistance, and doesn't introduce the ringing associated with an inductor. Crossover frequency is 2.7kHz.

Because Camber is a Canadian company, it has ready access to the National Research Council's testing facilities, run by Dr. Floyd Toole! In fact, Camber's factory is only a two-hour drive from the NRC. Although the NRC was used during the 3.5ti's design, Allan Devantier, designer of the Camber line, relied primarily on DRA Lab's MLSSA loudspeaker and acoustic measuring system. In fact, Allan was one of the early designers to use MLSSA, a system now considered indispensable in loudspeaker design and evaluation.

The 3.5ti is finished in black ash vinyl veneer (oak vinyl veneer is also available) and covered with a black grille cloth. A single pair of five-way binding posts is mounted at an angle in the terminal cup. Overall, the 3.5tis are well-built and attractive. I would, however, like to have seen a bi-wiring provision.

**Listening:** I auditioned the 3.5ti on the Mission stands with which the 782s and Fried Q/4s were auditioned. These stands are somewhat low, putting the 3.5ti's tweeter axis 2" above ear level. Camber stands are available for the 3.5ti for $59.

While breaking in the 3.5tis with the Dorian *Pictures at an Exhibition*, a time when I try not to listen to the speakers, I couldn't help noticing the feeling of low-frequency extension from these modest-sized boxes.

The 3.5tis have surprising bass extension and a subjective feeling of weight for their size. The low-frequency region was full, robust, and provided a strong musical foundation. Acoustic bass had a warm, rich presentation and conveyed a feeling of the instrument's body. Left-hand lines on the previously mentioned *Dick Hyman Plays Fats Waller* were more prominent and forward than heard through the Cyrus 782s, with a greater sense of weight. The 3.5tis did a credible job of reproducing the size and power of the organ on *Pictures*, a remarkable feat for a moderate-sized and -cost loudspeaker. Bass drum had a solid and deep impact, without the thin, wimpy quality often heard from mid-sized loudspeakers.

I felt, however, that the bass was a little on the underdamped side, giving a slightly loose and less articulate rendering. Although the 3.5ti's LF presentation had a certain satisfying solidity, it lacked the precision, detail, and transient abilities of the Cyrus 782, an area where that loudspeaker excels. However, the low-frequency region was remarkably uncolored. The sense of pitch in the lower registers was excellent, and there were no glaring resonances that imparted a common character to different recordings. Despite the slightly underdamped rendering, I enjoyed the 3.5ti's bass presentation. The degree of this criticism was minor: I certainly wouldn't characterize the LF performance as tubby or bloated. I felt the bass performance was superior to the Fried Q/4's in pitch definition and freedom from coloration.

The 3.5ti's overall tonal balance was quite smooth, but with an apparent uptilt in the treble. Throughout the auditioning, I felt that the treble had a hardness that made the upper octaves seem bright. Although there was some excess treble energy, the feeling of brightness was exacerbated by the treble's slightly metallic character. Cymbals had an edginess that brought them forward in the mix and called attention to them. The Bösendorfer's upper registers in the Fats Waller recording took on a slightly brittle sound. The entire treble could be characterized as dry and forward rather than silky-smooth and laid-back. The strings that open the tune "An Hour Away," from Scott Kreitzer's album *Kick'n Off*, were slightly chalky and bleached. Although the 3.5tis were smoother than many moderately priced loud-
speakers, they nevertheless imparted an etched quality to most recordings. Recordings that tended to be overly bright were pushed over the edge of listenability, while many smooth recordings became a little strident.

Throughout a large portion of the spectrum, however, the 3.5tis were remarkably smooth and free from coloration. There was a wide “window” from the upper bass to lower treble in which the 3.5tis were open, pure, and uncolored. This is the area of most musical importance, and the 3.5tis did a good job of reproducing natural instrumental timbres through this range, especially instruments without much HF content.

I experimented with toe-in angle and found the treble was smoother with the loudspeakers pointed straight ahead. This positioning greatly ameliorated the brightness, but at the expense of losing some upper-midrange energy. With the 3.5tis pointed straight ahead, some presence and life was missing from the music. Toed-in toward the listener, the presentation was too bright. I ended up doing most of the auditioning with a slight toe-in, achieving an acceptable balance between treble and midband energy. Incidentally, the 3.5tis were somewhat brighter with the listener’s ears directly on the tweeter axis. Remember, the Mission stands placed the 3.5ti’s tweeter about 2” above my ears. Stands that avoid placing the tweeters at ear level are therefore recommended.

Going back to the 3.5ti’s strengths: they presented an excellent sense of space and depth. They could throw a wide soundstage with precise positioning of instrumental images. Vocal and instrumental outlines were focused, stable, and presented with an appropriate sense of image size, although not quite to the degree heard through the Cyrus 782s. Centrally placed instruments and voices were apparently detached from the loudspeakers, and had a feeling of air and space around them. Soundstage depth was similarly impressive, with a distinct impression of distance. Try Reference Recordings’ Three-Way Mirror for a convincing feeling of three-dimensionality. Overall, the 3.5ti’s resolution of spatial detail was better than the Fried Q/4’s. However, the Q/4s had a much sweeter treble that was less fatiguing over long sessions.

**Measurements:** Playing the LEDR recording from the Chesky jazz sampler and test CD, I thought the 3.5ti did moderately well in the “Up” test. The image moved slightly above the loudspeaker and stopped without achieving the height sometimes heard. The “Over” was a little better, with the image leaving the left loudspeaker and traveling toward the right. The “Lateral” test, the easiest for a loudspeaker to reproduce, was good, the test signal producing a continuous image between the loudspeakers. I next drove the 3.5ti with a sinewave oscillator while feeling and listening to the enclosure. The 3.5ti was quite inert. Though many very small modes were apparent through the 100Hz–700Hz region, no serious cabinet resonances were detected. In addition, the very-low-amplitude modes I felt tended to be high in frequency (ca 500Hz) rather than below 300Hz, as is typical.

Looking next at the Camber 3.5ti’s impedance magnitude and phase angle (fig.13), we can see that the impedance is above 6 ohms across nearly the entire band. The 3.5ti should thus present an easy load to the amplifier. The two impedance peaks in the bass indicate the reflex woofer loading. The impulse response (fig.14) shows a very clean initial impulse, but with some ultrasonic tweeter ringing. Like the Cyrus 782, the use of a second-order slope can be seen as a slight hump in the impulse response during the tweeter-ringing portion.

Moving to the frequency domain, fig.15 shows...
shows the 3.5ti’s FFT-derived frequency response measured across a 30° lateral window. The nearfield woofer response, measured separately, has been added to the left portion of the graph. The plot reveals less high-frequency rise than I would have expected from the auditioning. The midband is quite flat, but with an overall rise in energy above 6kHz. The metal-dome tweeter resonance, indicated by the ringing seen in the impulse response, is visible at about 25kHz. The contribution of the 3.5ti’s port can be seen in the nearfield woofer response, augmenting the woofer output below its rolloff. (Note that the relationship between the three separate parts of fig.25 is arbitrary.) Finally, the 3.5ti’s waterfall plot is shown in fig.16. This is excellent performance and not surprising in light of the fact that the 3.5ti was designed with MLSSA; any resonant anomalies have been corrected. The decay is rapid and smooth, with just a faint touch of hash in the treble. Overall, the 3.5ti’s waterfall plot is excellent.

**Conclusion:** The Camber 3.5ti loudspeaker does many things well at the $700/pair price point, but its musicality is, I feel, somewhat compromised by its treble performance. On the plus side, the 3.5ti has a smooth and relatively uncolored midrange, surprising LF extension, solid bass presentation, and the ability to throw a convincing soundstage. Through the midrange, the 3.5ti presented natural timbres without glare or peakiness. The low-frequency performance, though a little underdamped, was solid, satisfying, and fairly well detailed. The subjective bass extension was deeper than what one would expect from the 3.5ti’s cabinet size. The 3.5tis’ spatial presentation was excellent, with the ability to throw well-focused images between and behind the loudspeakers, and with correctly sized images.

On the down side, I found the treble a little bright, and with hard textures. Either one of these characteristics by themselves may not have been a detraction, but combined, music took on a slightly etched, brittle quality. This was manifested as forward cymbals, steely violins, and an overall dry treble rendering. Positioning the listener off-axis by pointing the 3.5tis straight ahead somewhat ameliorated the brightness, but at the expense of reduced midband energy.

My criticisms of the 3.5ti should be put in perspective: it offers excellent performance in many areas, and any speaker is bound to have some deficiencies at the $700/pair price.
Depending on where the listener places his sonic priorities, the Camber 3.5ti may be for you. It has a very different sonic signature from the Mission Cyrus 782. Where the latter’s lean bass presentation and laid-back perspective may appeal to some listeners, the 3.5ti’s warm bass and forward rendering may be better suited to other tastes. I preferred the Cyrus 782’s musical interpretation.

Despite the criticisms noted, I can nevertheless recommend the Camber 3.5ti. During the auditioning, I enjoyed listening to music through them, the ultimate statement about any product.

FOLLOW UP

Carver Silver Seven-t amplifier

EDITOR’S NOTE: in this year’s January issue (Vol.13 No.1), Robert Harley reviewed the Carver Silver Seven-t monoblock power amplifier and was not impressed with its sound. Yet just one month earlier, in his December ’89 “Final Word” column, Larry Archibald had reported that the Silver Seven-t had produced a good sound when used to drive the midrange/tweeter panels of the Infinity IRS Beta loudspeaker system. In view of this disparity of opinion, I had appended a footnote to RH’s January review—“I feel a ‘Followup’ is definitely in order”—and had accordingly arranged for the pair of SS-t amplifiers auditioned by LA (serial numbers 00228 and 00302) to be shipped to J. Gordon Holt. Unfortunately, one of the pair (00228) was lost in transit, delaying JGH’s “Follow-Up” review until Carver Corporation could ship a second pair of amplifiers to him. The serial numbers of the new pair were 00428 and 00490, the same as the pair that RH had reviewed and that had appeared to go unstable on the test bench when driving a 2 ohm load at very high levels. Tamara Barratt of Carver had told LA that these two amps were the same ones RH had listened to, but she was unclear as to whether they had been repaired. I therefore carried out a set of measurements on one of these amplifiers after JGH had finished his auditioning to determine, among other things, that it was functioning correctly. So, without any more ado, what was Gordon’s impression of the Carver Silver Seven-t’s sound, a sound that has been said by Bob Carver to “virtually replicate” that of his $17,500 Carver Silver Seven tube amplifier?

—John Atkinson

JGH reports: Personally, I think LA was closer to being right about this amp than RH, who heard from it “no redeeming sonic virtues.” I disagree; I heard several. On the other hand, I don’t think it sounds “just like a tubed amplifier,” because there is no such thing as “a” tubed amplifier. There are lots of them, and no two sound alike. But most of them do tend to share certain sonic earmarks: a slightly warm, rich low end with only moderate detail and impact, a rather forward, bright (some would say overbright or “glassy”) midrange, and a high end that is either silky-smooth and musical if your speakers have superb top, or dull and lifeless if they don’t. Tubed amps tend to reproduce depth very well, and in the opinion of many people whose judgment I trust (I’m one of them), they tend to produce a stronger impression of listening to real (acoustical) instruments than most solid-state amplifiers, which are often more analytical than euphonic. Well, I hear a number of those tubey traits from the Silver Seven-ts, but not all of them.

On first listen, after an hour or two of warmup, I was passionately in the RH camp. The Seven-ts sounded awful—coarse-grained, congested, and completely flat, with bass that had all the impact of a wet sock. (And I do not mean the kind of sock you feel in the pit of your stomach; that they did not have.) I wondered whether LA wasn’t getting soft between the cochleae.

After four hours more of cooking, I began to think they were sounding a little less awful, but I wasn’t sure. So I gave them four days before the next listen.

Transformation!!!

I cannot recall when I have heard this much improvement from any electronic product as the result of nothing more than a prolonged simmer. (Actually, an inappropriate word here; the Silver Seven-t runs ridiculously cool.) They still did not have the bass of a Krell or the highs of a Levinson, but then neither does any tubed
amplifier, and that’s what I believe these are supposed to sound like. They did, however, have much of the best tube amps’ midrange authority and aliveness and high-end sweetness, and I soon found myself—rather to my surprise, after what RH’s review had led me to expect—actually enjoying music (and Laserdisc soundtracks) through them. Lower middles through my Sound-Lab A-3 electrostatics had a weight and gutsiness I have not heard from that speaker before, and I liked it.

Inner detailing was very good but not superb, and—as is to be expected from totally isolated power supplies—the soundstage was very wide, with the capability of good beyond-the-speakers imaging. But the soundstage was not very deep, even in comparison with my pair of VTL 300s, which are just as forward-sounding (if not more so). Highs were just a touch dry, with some (but not all) of the wispy delicacy of real music, but the low end was a disappointment.

I have come through the years to associate high power with deep, tautly controlled lows in which you feel you can “count the cycles” from an open-string bowed double bass. The Carvers did not do this. Although they were easily capable of bottoming-out my speakers on Telarc-style bass, they did not have much impact or pitch delineation at the low end. They were not, however, remotely thin-sounding; if anything, the bass was a little on the heavy side, just as it is with most tubed amps.

Most top solid-state power amplifiers sound (to me) just a little bit withdrawn through the midrange, as though their frequency response is very slightly dished-down in the middle (although none ever measures that way). The Carver does not. It is less forwardly bright (“alive”) than my VTLs, but there is no way I would describe it as being “thin,” “shrill,” “hard,” or any of those other nasty terms which add up to unlistenable. Why, then, did RH find them to be so?

Assuming this isn’t another case of sample-to-sample variation (which I doubt, as my two samples were audibly perfectly matched), I think it was the speakers Bob was using for his review. While I never heard the Martin-Logan Sequel IIs in New Mexico, I did hear them on several occasions at a friend’s house in Denver.

I never cared for them, largely because they sounded (with the amps we had on hand) almost exactly the way Bob described the Carvers as sounding. Those Sequel IIs were, in fact, the first loudspeakers I’ve heard that sounded excruciatingly strident with my VTL 300s. (The VTLs do not have the usual tube-amplifier warmth and richness; they are very close to being absolutely neutral in “color.” The VTLs sounded gorgeous with the Betas when I was testing those speakers; LA felt the Carvers did very well with Betas, too.)

I haven’t heard the $17,500 Carver Silver Seven tube amplifier, so I can’t compare the SS-t with it. But I do feel RH came down too hard on its solid-state cousin, for subjective flaws which I conjecture may have had more to do with his loudspeakers than with the amplifier. $1000 a pop isn’t all that cheap, but when it comes to dollars per watt, there’s nothing else I know of that comes even close to the Sevents. (The dbx BX-3 is claimed to deliver 400Wpc for $1299, but it’s hard to find. Most dealers will tell you dbx got out of consumer electronics two years ago, but they didn’t. Only some products were discontinued.)

In other words, the Silver Seven-t is not to be lightly dismissed—certainly not as peremptorily as Bob cast it into the outer darkness. It does some things very well, it is very neutral through the all-important midrange, and it has as much power as amps costing more than $4000 each. As I see it, these “redeeming” features help to offset the fact that the Seven-t is not the suavest-sounding amp you can find. But for that price, even at 50Wpc, what is?

Carver’s Silver Seven-t amplifier is recommended, with reservations.—J. Gordon Holt

JA measures: Both in order to ascertain whether the samples of the Silver Seven-t that J. Gordon Holt auditioned were ostensibly the same as when Robert Harley had reviewed them, and to see if there were any measured reasons for this disparity between our writers’ opinions, I carried out a set of measurements similar to those that Bob had done to support his original review.2 The amplifier tested (SN

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1 In fact, they did it more often than they should have, apparently because of their relative lack of overshoot control.

2 The measurements were performed with Stereophile’s Audio Precision System One, using high-power resistive loads built by Robert Harley. The distortion as frequency graphs were made with the SS-t and Audio Precision grounding arranged to give the lowest measured THD and noise. A Heath/Zenith 8-bit storage oscilloscope was used to capture the square waveforms, and DRA Labs’ MLSSA system was used as a distortion analyzer for the 50Hz and 19-20kHz spectrum analyses.
00428) was preconditioned by driving 100W of 1kHz into an 8 ohm load for 30 minutes. The chassis had gotten very hot by the end of this time, but monitoring the distortion didn’t show any change through this period after the first minute, implying that the amp was working correctly.

Though the FTC-recommended preconditioning level is one-third full power, which thermally stresses a class-B amplifier to the maximum, I arbitrarily decided upon a 100W level for preconditioning as this sample of the Silver Seven-t turned off due to overheating after about 25 minutes at the one-third power level. (A later test with the other sample, SN 00490, showed that it would drive one-third power, 191.67W, into 8 ohms for the FTC-specified 60 minutes, though the chassis became far too hot to touch.)

Though the SS-t is rated at 575W into 8 ohms, its use of a sophisticated, switched-voltage output stage means that it would be unwise to expect the amplifier to be able to deliver this power into an 8 ohm load on a continuous basis. Carver’s design philosophy, which I believe first appeared in its diminutive but powerful “Cube” in the early ‘80s and which I have also seen in amplifiers from NAD, Proton, Hitachi, and Soundcraftsmen, is to give the amplifier’s output stage a dual personality. The amplifier appears to be conventional at low volume levels, its output stage powered by relatively low-voltage rails. However, when the musical signal (which can often have transient voltage peaks very much higher than its average value) requires a brief high-power burst which would otherwise drive the output stage into clipping, the output stage switches automatically to higher-voltage rails in order to pass these peaks without waveform distortion. The amplifier’s heatsinking is not adequate for maintaining the higher output power indefinitely, however, and is actually more appropriate for a lower-powered design. Nevertheless, with typical music program, the effect is of a much more powerful amplifier than its size and heatsinking would suggest.3

And the SS-t does indeed appear to be a very powerful amplifier. On a short-term basis with a 1kHz tone, the clipping point is 8 ohms (defined as the output power where the THD+ noise reached 1%) was 619.5W (27.9dBW), while into 4 ohms it raised 910.5W (26.6dBW). Into 2 ohms, I measured an astonishing 1087W at 1% THD (24.3dBW). Though these clipping power figures are better than the amplifier’s specification, which describes the SS-t’s maximum power as 575W into 8 ohms (27.6dBW), 900W into 4 ohms (26.5dBW), and 1000W into 2 ohms (24dBW), they must be regarded as approximate rather than absolute, as, not surprisingly, the AC line voltage from the wall drooped at these very high power levels. Measuring 117.7V RMS with the SS-t not handling any signal, the line voltage dropped to 114.3V RMS with the amp clipping into 4 ohms and 107.2V RMS with it clipping into 2 ohms. For reference, RH had measured 608.4W (27.8dBW) and 878W (26.4dBW) into 8 and 4 ohms, respectively, for the same 1% THD point.

A final test I performed after the testing had been finished was to see how long the SS-t could sustain its specified power. It managed to drive 575W at 1kHz into 8 ohms with the distortion remaining below 0.068% for almost nine minutes before shutting down. This is excellent performance for this kind of amplifier design, implying that it will be practically burst-proof under normal conditions of use.

Fig.1 shows the frequency response of SN 00428 measured at a 1W level into an 8 ohm resistive load. This is identical in shape to that in Robert Harley’s fig.1 (Vol.13 No.1, p.156), a slight rise being apparent in the high treble, followed by a rolloff above 20kHz. This response

3 See my “As We See It” in Vol.12 No.8, August 1989, for further discussion of this subject.

4 Stereophile’s convention for rating amplifier power in dBW is to subtract 3dB from the calculated figure when the load impedance halves. A “perfect” amplifier would then give the same dBW figure into any load, an easy paradigm to understand.

5 The main 12A fuse was replaced with a 15A fuse for this measurement, as cautiously recommended in the owner’s manual when the SS-t is to be used with very-low-impedance loudspeakers.

Fig.1 Carver Silver Seven-t, frequency response at 1W into 8 ohms (0.5dB/vertical division)

Stereophile, October 1990
was identical at 100W into 8 ohms and very similar into 4 ohms at the same voltage (ie, a 2W power level), though with very slightly more ultrasonic content. At higher levels into 4 ohms, however, a slight kink appeared at ultrasonic frequencies. Fig.2 shows the response at 200W into 4 ohms, plotted up to 100kHz, while fig.3 shows the response at 200W into 2 ohms. This is plotted only up to 56kHz, due to what I believe to be the amplifier’s protection circuitry cutting off the output above this frequency. I suspect that at these frequencies and levels, I was approaching the edge of the SS-t’s output stage design envelope which, as implied earlier, appears to be optimized for the demands of real-world music program rather than for steady-state test tones.

Robert Harley found that the SS-t’s output impedance was very high for a solid-state design, measuring 1.24 ohms at 20Hz, dropping to 1.16 ohms at 20kHz. My measurements of output impedance were identical, within experimental error, measured at an approximate 2.83V, 1W/8 ohms level. (The 1kHz figure of 1.2 ohms at this 2.83V level was maintained with the amplifier delivering a hefty 28.3V RMS.) My experience suggests that this high impedance will correlate with both JGH’s and RH’s opinion that the SS-t lacks definition in the bass. Whether it will prove musically problematic to other listeners will depend on the speakers they use. In my opinion, it will be less noticeable with well-damped sealed-box loudspeakers, for example, than with rather underdamped reflex designs, though Larry Archibald did note in last December’s “Final Word” that he “was dissatisfied with it [the SS-t] on the bottom [of the Infinity Betas].”

These output power, output impedance, and frequency-response measurements suggest to me that the amplifier as auditioned by JGH was substantially the same as when RH had listened to it for his review.

Were there any other measurements which would correlate with any of the listeners’ descriptions of sound quality? Looking at distortion and noise levels, fig.4 shows the values measured between 20Hz and 20kHz at 1W and 100W into 8 ohms. The curves are nominally identical above 500Hz, the apparently higher level of distortion at the lower level below this frequency being due, in my opinion, to the measured distortion sinking below the amplifier’s noise floor. Note that above 2kHz or so, the THD rises above 0.1%, reaching 0.6% at the top of the audio band, which is a hair above the specified figure of 0.5%. The distortion level also rose with the amplifier driving lower-impedance loads, fig.5 showing the THD+noise at 2W and 200W into 4 ohms, and fig.6 that with the amplifier delivering 4W and 200W into 2 ohms. My interpretation of these graphs is that the Silver Seven-t does have a slight problem maintaining linear behavior at high frequencies into low-impedance loads. The levels of distortion above 2kHz or so might
become audible with some kinds of music with the amplifier driving loudspeakers that feature very low impedances in this frequency range—the Martin-Logan Sequel II used by Robert Harley, for example, which drops below 4 ohms above 5kHz.

The superbly low distortion levels at low frequencies and high levels implied by the Audio Precision measurements were confirmed by looking at the spectrum of distortion products with the amplifier delivering a low-frequency (50Hz) tone at high levels. Even into 2 ohms at an 800W level, the absence of distortion products was excellent, as can be seen from fig.7. To examine the high-frequency linearity in more detail, I used a 1:1 mixture of 19kHz and 20kHz tones, sourced from CD, using the Esoteric D-2 D/A processor which produces negligible levels of downband intermodulation products with this signal—see fig.20 in RH's review elsewhere in this issue. Fig.8 shows the spectrum from 300Hz to 30kHz with the amplifier reproducing the two tones into 8 ohms at a 1W level. Any difference product at 1kHz due to the SS-t is below the resolution floor of the measurement system, while the sidebands at 18kHz and 20kHz are also vestigial. This is excellent performance. Increasing the level to 200W into 8 ohms, however, brings up both the 1kHz difference product and the sidebands, but not to any level that I would consider problematic. At high levels into lower impedances—fig.9 shows the spectrum with the amplifier driving 400W into 2 ohms—rather more sidebands appear, the highest of which measure –55dB with respect to the 19kHz level. The cursor shows the level of the 1kHz difference product at approximately –61dB, which is still low, however.

Finally, I examined the squarewave waveforms at a number of levels and loads. (No anti-aliasing filter was used for these figures, any ringing or overshoot being therefore due to the amplifier and not to the storage 'scope. The sampling rate was 250kHz.) Fig.10 shows a 1kHz squarewave at a 1W level into 8 ohms—a perfect shape, with a slight rounding to the
leading edge due to the SS- t's ultrasonic rolloff. Increasing the power into 8 ohms (fig. 11) introduces a slight overshoot, as does lowering the load (figs. 12 & 13).

To sum up these measurements, I agree with JGH that Carver's Silver Seven-t offers an astonishing number of wats for its $2000/pair price. My enthusiasm must be tempered, however, by the fact that I feel that whether the amplifier's user will be able to exploit all that power will depend on a number of other factors, most important of which will be the kind of music he or she chooses to play. With spiky, transient-rich classical music or rock music with high-level drum tracks, the SS-t will deliver what its specification promises—all day long. But with music that more nearly approaches the steady-state—synthesizer or organ, for example—asking for all that power for more than a few minutes will lead to a rapid increase in the heatsink and case temperature, with the result that the amplifier will eventually shut down to protect itself. This will be presumably more likely if the user pairs the SS-t with loudspeakers that are both insensitive and feature a low impedance.

Regarding its sound character, the SS-t's somewhat loose, not very well-defined bass can undoubtedly be attributed to its very high output impedance, in my opinion. I also suspect that the interaction between this high source impedance and the low load represented by the midrange/treble IRS Beta towers gives a voltage-divider action that usefully depresses the speaker's treble. This might help explain why LA was so impressed by the combination. On the other hand, the Sequel II's also have a low impedance in the same region, yet RH was still bothered by the amplifier's sound in the treble. (I don't have any data on the impedance of JGH's Sound-Lab speakers.) Whether the SS-t has a treble character or not is perhaps due both to its high output impedance and to what appears to be increasing levels of high-frequency harmonic distortion when it is asked to drive low impedances. Whether this distortion will be audible or not will depend on the listener's preferred listening levels, on the loudspeakers used, and on the degree of masking offered by his or her favorite kinds of music.

I suspect, therefore, that the Silver Seven-t's sound will be somewhat system-dependent; prospective purchasers should audition the amplifier carefully with their own loudspeakers and their own favorite music before making a final decision. In view of Gordon's finding that the SS-t takes a long time to reach its optimum performance, they should also ensure that it is fully warmed up by the dealer before any auditioning takes place.

It is possible that this follow-up review may be moot, however. According to a report in the industry newsletter Inside Track (Vol. VI No. 21), Carver introduced a revised version of the Silver Seven-t at the June 1990 CES in Chicago. The Mk.II SS-t monoblock was said to feature a "modified transfer function" which, presumably, would affect the amplifier's sound quality, thus the relevance of both RH's and JGH's findings.

—John Atkinson

Stereophile, October 1990
Magnum Dynalab FT-101 FM tuner

Magnum Dynalab has initiated an update program for all FT-101 FM tuners manufactured since the product introduction at the 1985 Winter CES. The FT-101 received a favorable review in Vol.8 No.4 but has been the subject of both positive and negative changes over the past five years. Dealer and consumer feedback has either been to coincide with my positive initial reaction or to wish me an unpleasant death for my unjustified product approval. Therefore, I decided to send my own 1986-vintage FT-101 to the manufacturer for a shot of renewed RF and audio vitality to see if the end results would vindicate both our names. What I received back is worthy of a second recommendation and vindication.

Cost of the upgrade modifications ranges from $265 to $585. My suggestion is to go for the $336 package because this offers the largest performance boost for the buck: AudioQuest Ruby OFC internal interconnecting cables, polypropylene output capacitors, WBT RCA output jacks, instant-on circuit that eliminates warm-up drift, replacement of IF filters with custom-selected parts for improved selectivity and fidelity, and an improved voltage regulator. The above covers RF upgrades and audio improvements for either the HI or LOW audio outputs. For both, the price is $485. Kimber Kable is an additional $50 for one output, $100 for both. New or different-finish faceplates are $150. All modifications by appointment only.

Magnum Dynalab claims the modifications expand the FT-101’s specifications to that of the $1275 Etude, except that the Etude has the advantage of high-blend defeat for maximum stereo separation. Therefore, it seems logical that if you are a not-so-satisfied FT-101 owner, a dealer with one gathering dust, or if you can find an FT-101 reasonable on the used market, then the upgrade program is a good deal. What you will get is an FT-101 at least as good, if not about 10% better, than all standard models produced to date. This is not to imply that the upgraded FT-101 is the finest tuner made, but that it is about 80% as good as the best modern tuners. With a good antenna, a spruced-up FT-101 will satisfy 75% of the listeners who will use it. For the other 25%, I’m still looking. Please refer to LG’s recent review of the Etude tuner (Vol.13 No.8, August 1990) for an evaluation of a similar product. —Don Scott

Dahlquist DQ-12 loudspeaker

Following Robert Harley’s review of their DQ-12 in April (Vol.13 No.4), Dahlquist sent us another set of the loudspeakers for JA to try in his listening room. Other new equipment waiting in the review line caused a delay in his getting to the second pair. Since JA was embroiled in matters cbez Avalon, and since the Stereophile listening room currently being used by DO and myself appeared to be in a rather effective stage of its acoustical transformation, I volunteered to give a serious listen to the DQ-12s for a followup. The fact that I had just finished evaluating another loudspeaker in the same general price range (the Signet SL280) appeared to make the move even more appropriate. To add grist to the mill, I had heard RH’s original review pair in his listening room back in February, when the initial evaluation was still in progress.

Readers should refer to RH’s original review for complete details on the Dahlquists and on the results of his listening tests, but since there are always new (and drop-in) readers, a brief system description is in order. Ready? Three-way design with 8” woofer (sealed, acoustic-suspension loading), 5” midrange (in a unique cylindrical, “aperiodic” loaded subenclosure which allows some rear radiation to escape for some controlled dipole radiation, which Dahlquist argues improves depth-of-field reproduction), and 1” soft-fabric dome tweeter. The midrange and tweeter are mounted above the woofer cabinet on their own, separate baffle, shaped to minimize diffraction and tilted back slightly to put the drivers on the same acoustic plane, à la Dahlquist’s longstanding “Phased Array” concept. A large, fixed grille, designed to be left in place, covers the entire front of the loudspeaker, except for the lower few inches of the woofer cabinet. Spikes are fitted, and terminals are provided for biwiring—which was used for the listening tests.

The DQ-12s were set up on the short wall of the listening room, 3–4’ out from the side walls

1 See the review of the Signet SL280 in this issue for a brief description of this room.

2 Some observers continue to claim that the original Dahlquist was a dipolar design. It was not, in the strictest sense. If one discounts the broad radiation pattern of the lowest bass (characteristic of any low-frequency driver), only the midrange driver had any rear radiation by virtue of its free-space mounting. And the rear of that midrange was covered by a thick piece of felt to damp such radiation. The midrange energy radiated from the rear of the DQ-12 appears greater, from my recollection, than that from the original DQ-10, though the mists of time make that something of an educated guess.
and well spaced (6–7') from the rear wall. Associated equipment used included the Aura turntable with Graham tonearm and Koetsu Rosewood Pro IV cartridge, Rowland Consonance preamp, Kinergistics KBA-75 and (briefly) Sumo Andromeda IIA amplifiers. CD playback was via the Esoteric D2 D/A processor driven by the digital outputs of the NAD 5000 CD player. Interconnects were by Cardas (Hexlink from turntable to preamp, and ca 20' of unbalanced from preamp to power amp), AudioQuest (Lapis from CD to preamp), and generic (75-ohm video coax from CD digital output to processor). Speaker cables were a 7' bi-wire set of AudioQuest LiveWire Cables.

When I read RH's review in the April issue I was not surprised, considering what I'd heard on my visit to his listening room. Although in the two hours or so spent listening to the DG-12s on that occasion I had not felt that they were tipped-up in the treble to the point of distraction, tipped-up I nonetheless found them. The low end was surprisingly strong and robust, though a considerable way from the best in definition and clarity. Certainly competent bass for a $1200/pair loudspeaker, however. The rest of the range was open, reasonably transparent, and lacking obvious colorations. And the soundstage was precise.

Naturally, when I got the DQ-12s into my listening room, the first thing I wanted to listen for was any indication of an etched and aggressive top end. In using our (briefly, sigh) in-house sample of the Koetsu Rosewood Pro IV, I hoped to give the Dahlquists their best shot. In my admittedly all too brief time with this cartridge, it had impressed me as a sweet yet detailed pickup with a slight tendency to lushness — characteristics which should surprise no one familiar with the Koetsu sound. It also measured that way: ±1.1dB from 30Hz-16kHz (except for slightly more than an additional 1dB dip around 5kHz), with the general trend within those tight limits being slightly up at the bottom and down at the top. The Koetsu also very definitely had that "palpable presence" about which we reviewers tend to yammer on so excitedly when we hear it.

So what did I hear? A lot "less" than I expected. Less upper-octave energy, that is. I began with a number of selections with closely miked — but superbly recorded — pop and jazz female vocals. First up was The Flips' album What's in the Bright Pink Box? (Flying Fish FF-4574). The vocals were rather breathy, the sibilants emphatic but not spitty or sizzly. Record noise was not emphasized in any way, however, and the midrange was very open, clean, and boxless. On Jennifer Warnes's track "Ballad of the Runaway Horse" from Duets (MCA-42131), much the same impression was made. Overtones were a bit prominent, and Jennifer Warnes's voice was definitely on the cool side of neutral. But it was nowhere near being unpleasant or unlistenable; on the contrary, the sound was open and airy. The midrange clarity was again evident. The bass lines on this track were less taut than I've heard them previously, with the occasional double-bass note exhibiting some overhang; I was tempted to do some tweaking of the placement in hopes of tightening up the low end.

But I decided against it; the bass was generally acceptable, and I was disinclined to risk sacrificing a setup which was giving me a soundstage very fine in width, depth, and in an "expansive" quality which enabled it to "detach" quite effectively from the loudspeakers. I would not describe the high-frequency response as self-effacing or subtle, but it wasn't really over the top, and didn't detract from the Dahlquist's other strengths.

The quality of its midrange was definitely a real plus; the vocals on Taj Mahal's Recycling the Blues & Other Related Stuff (Columbia KC-31605) were convincing and appeared to be doing justice to what the Koetsu was pulling from the grooves. The lush quality referred to earlier in reference to Koetsu pickups in general did appear to be somewhat restrained, but not to the degree that the loss would jump out at you unless you were specifically listening for it. My whirlwind survey of favorite LPs continued, including Center Stage (Wilson Audio Specialties W-8824). Here the Dahlquists added a degree of sparkle to the sound — not at all unpleasant on this recording — but a bit too much crispness to the percussion and sheen to the brass. The famous Wilson bass drum on this recording was full but not partic-

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3 A characteristic which is so prevalent with the fixed tones of the CBS STR-100 test disc that I use, with practically every cartridge I have measured, that I am beginning to discount it at least partially as an artifact of the record.

4 The Flips are an a cappella group in the mold of The Nylons and The Bobs. By cautioning you about the occasional X-rated lyric on this album, I'm probably guaranteeing the group's future success.
ularly tight—owners of Wilson HOWs would not be amused, but the low-frequency performance was still respectable for the DQ-12's price class. The Dahlquists did handle this recording at impressively high—read "realistic"—levels without loosing their composure or upsetting mine.

Up to this point I was pleasantly surprised. While I did not feel that the Dahlquists' highs were entirely neutral or self-effacing, I would certainly put them within the broad range of acceptable HF balance for a medium-priced loudspeaker. I do have to say, however, that I would caution strongly against using the DQ-12s with associated components with similar tendencies—tipped-up MC cartridges or bright-sounding electronics, in particular.

Now it was on to CD's. Here I began to note a degree of thinness through the upper bass/lower midrange. As I listened my way through the superb Astrée sampler (Astrée 7699), I felt that the reproduction was decided on the cool side of neutral—evident on a broad range of material, from guitar to voice to double bass. I've noted over the years that getting this balance right is one of the trickier aspects of loudspeaker design. Too little energy in this region, provided it isn't taken to an extreme, often translates into an "open" quality to the sound—though with some loss in the almost tactile "there-ness" of instruments and voices. This is the sound I was getting from the Dahlquists, and I can't deny that their openness and detail were very enticing, their superior soundstage also continuing to make a vital contribution. While the treble was still prominent, it was in no way spitty or tizzy. I still suspected that their top octave had some lift, but a smooth, controlled one; not, certainly, one as obvious as in the samples I'd heard at RH's. The midbass leanness I was becoming aware of (I suspect the naturally greater warmth of LPs, plus the inherent traits of the Koetsu, had made it less evident in vinyl playback) was not a major flaw, but it did somewhat increase the analytical trend in the overall balance.

As the listening progressed, the brightened high end was becoming most evident on vocal sibilants, high percussion, and closely miked pop material having strong HF content. Whenever the HF material became especially complex, with many details occurring simultaneously, those details also exhibited a tendency to run together—a reduction in intertransient silence, if you will. But on much program material this quality was not in evidence.

At this point I went back briefly to LP listening, to revisit (and confirm or refute) some earlier observations. In particular, I should point out that on my first listen to LPs I had not used the spikes provided by Dahlquist, preferring instead to determine the suitability of the chosen loudspeaker positioning prior to firmly affixing the DQ-12s. Now, with the spikes in place (as they had been on the CD listening), I did notice on vinyl a trace of the same upper-bass/lower-midrange leanness noted with CDs. Since spikes usually have a tendency to tighten up the sound (and the overall focus), this was not an inconsistent result.

It was perhaps unfortunate for the Dahlquists that I had just reviewed the Signet SL-280s, for which I had built up a great deal of enthusiasm. Compared with them, I felt that the Dahlquists had less bass pressure and smoothness. The Dahlquists had the more cohesive and defined mids, as well as a bit more neutral perspective. But the Signet had a more naturally full-bodied sound throughout the upper-bass/lower-midrange region, resulting in more liquid, balanced instrumental and vocal timbres. Soundstaging for both loudspeakers was very good by any definition, and excellent within their price classes. But at the top of the spectrum the more subtle, never etched, yet at the same time fully detailed treble of the Signet emerged, for me, as the clear winner.

Methods: Since the new DQ-12s sounded clearly better balanced than the old, we decided to rerun a few of the measurements. It's quite clear from fig.1 that the high-frequency response of the newer samples is far better controlled than that of the old, though the current

![](image)

**Fig.1** Dahlquist DQ12, FFT response averaged across 30° lateral window, old sample (top), new sample (bottom)
versions bear no "i" designation. Note the drooping response centered below 500Hz; this may relate to the reduction in body of instrumental timbres noted in the listening sessions.

I had, in the course of my listening sessions, experimented with less than a fully toed-in configuration—most of the listening was done with the loudspeakers aimed at the listening position. With the DQ-12s turned outward a bit toward a forward-facing position, the subjective impression was of a brighter, harder sound, though one with perhaps a shade less top-octave energy (and somewhat less soundstage focus). I tried adjusting the toe-in twice with similar results; the fully toed-in position was finally judged, in my circumstances, to be the best. The off-axis curves of the Dahlquist, however (not shown), were, if anything, slightly smoother than the composite 30° window shown, and did not explain this observation.

Conclusions: Though our latest pair was dramatically improved over the original review samples, the treble quality of the DQ-12s remains their most controversial characteristic. They had plenty of sparkle and detail, yet still asserted themselves just a little vigorously in the high end of much (but by no means all) program material. They did, however, make a case for themselves with an open, spacious soundstage and focused, low-coloration midrange. I was able to attain a slightly smoother low end in my room than RH had in his, but the penalty here was less overall bass energy. I'd love to hear these with a sweeter, less obvious (metal-dome?) tweeter, and a shade more upper-bass/lower-midrange output. Their current strengths do make them worthy of a middle Class C recommendation, though judging from the rather dramatic difference between our early samples and the latest versions, I have to recommend a careful audition and careful matching with associated components. Not bad recommendations, come to think of it, with any loudspeaker.—Thomas J. Norton

Parasound HCA-800 II power amplifier
The original version of San Francisco manufacturer Parasound's inexpensive HCA-800 stereo power amplifier was reviewed by TJN in Vol.11 No.2, with a "Follow-Up" review of the revised HCA-800 II appearing a year later in Vol.12 No.2. Though it sounded a bit closed-in, TJN felt that the amp sounded especially sweet at its $365 price and deserved a recommendation due to its generous presentation of the recorded soundstage. Earlier this year, Parasound (which counts among its staff and consultants electronics wizard John Curl and one of the best listeners I've met, Karen Richardson) further revised the HCA-800, raising the price to $395 in the process. The new amplifier features a toroidal power transformer, heavier-gauge OFC internal wiring, and double the number of output devices; has had its 8-ohm power raised from 80Wpc to 100Wpc; and is said to be able to drive 2 ohms with increased stability.

I gave a brief listen to the revised Parasound, driving Avalon Eclipses via 5' bi-wired sets of AudioQuest Clear Hyperlitz cable. I know, I know, $7000/pair loudspeakers and $1000 cables are not the kind of company one would expect an amplifier selling for a hair under $400 to keep. Nevertheless, I didn't want to change any other variable in my system; otherwise, how could I get a handle on the amplifier's sound? Source was the Meridian 208 CD player/preamplifier driving the amplifier via a Mod Squad Line Drive Deluxe AGT to adjust the playback level. (Though the HCA-800 II has independent volume controls for each input, facilitating its use with a CD player fed straight in, I wanted to use these controls to match levels to the amplifiers with which I was comparing the Parasound.)

The Parasound's output was polarity-correct—non-inverting—and with the volume control full up had a gain of 29.72dB when loaded by the Avalon speakers. Following a period of two hours' or so warm-up—the case nicely hot—it was time to put the HCA-800 II through its paces. The first CD to slide into the Meridian's maw was the Harmonia Mundi USA recording of Corelli's Op.6 Concerti Grossi from the Philharmonia Baroque Orchestra led by Nick McGrath (HMU 907004). A beautifully natural recording by Peter McGrath, this reproduced via the Parasound with a sweet high end and a good sense of space. Comparing the sound with that of the Adcom '555 II (see later) revealed the more expensive amplifier to throw an even greater sense of depth and to have a

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rather warmer tonality. More important, the Adcom better reproduced the sense of the music's dynamic ebb and flow. In fact, had I not rechecked the level matching (using a 1kHz tone), I could have sworn the Parasound was not playing quite as loud.

I had the same experience with rock music. "Behind the Veil" from Jeff Beck's Guitar Shop album (Epic 44313) starts with some whammy-bar meandering, then flamboyant drums, before Beck's Stratocaster guitar comes in with the tune, backed by formless-sounding but undoubtedly a thick synth bass lines. (Imagine a smooth-strung Fender bass played with a thick felt pick and played through 24" speakers without any high-frequency drivers to get an idea of the sound of these bass figures.) Via the Parasound, everything can be heard; via the Adcom, it's as though the soundstage has expanded backwards while at the same time the low frequencies have acquired another octave's extension.

To put this into perspective, I'm beginning to suspect the Adcom of being much better-sounding than it has any right to be—and it is twice as expensive as the Parasound. Taken on its own terms, the HCA-800 II produced a musically satisfying sound from the Avalons, with actually both more bass impact and weight and a better-defined soundstage than I had expected from an amplifier costing less than $400. Its high frequencies were a little uptilted compared with either the Adcom or the Audio Research Classic 60 that usually sits betwixt the loudspeakers in my listening room, but treble grain only became annoying at very high playback levels. At normal listening levels, even such wide-range classical music as the introduction to the Intermezzo of the Ashkenazy recording of Sibelius's Karelia Suite (London 414 534-2) reproduced with impressive image depth, a good sense of dynamics, and generally natural tone colors.

To sum up, the latest incarnation of Parasound's HCA-800 II fully deserves its Class D ranking in Stereophile's "Recommended Components" listing. It offers more than a touch of high-end sound at a very affordable price.

— John Atkinson

Adcom GFP-565 preamplifier

When he reviewed Adcom's $800 solid-state preamplifier, the GFP-565, in Stereophile's February 1990 issue, Gary Galo enthused at length over its sound quality. Following comparisons with the Forte 2, Adcom GFP-555 and GTP-400, Hafler DH-110, and even the Audio Research SP11 Mk.II, he concluded that the GFP-565 "is a superb preamplifier that can hold its own with all but the most expensive products"; it "sets the standards for preamps under $1000" and easily deserves a Class B rating in Stereophile's "Recommended Components" listing.

However, when I compiled the April 1990 "Recommended Components," I thought it only fair to give the GFP-565 a provisional Class C recommendation and arrange for the preamplifier to be subjected to some further listening in Santa Fe. Accordingly, Gary sent me his review sample of the GFP-565; Victor Campos of Adcom also sent a separate sample.

Both preamplifiers were substituted into my current reference system: Meridian 208 and Kinetics KCD-40 CD players; Audio Research Classic 60 power amplifier; Avalon Eclipse loudspeakers, connected to the power amplifier with 5' bi-wired lengths of AudioQuest Clear cable; Audio Research and AudioQuest Laps interconnects; Linn Sondek/Ekos/Troika LP player. For comparisons with either a Mod Squad Line Drive or a Mark Levinson No.26 preamplifier, levels were matched at 1kHz. The Adcom GFP-555 II amplifier was also used some of the time, connected to the speakers with Mission speaker cable.

The GFP-565 has three sets of outputs: Main (Normal and Lab) and Bypass. Although the tone controls can be switched out of circuit when the preamp is used from its Main outputs, the Bypass outputs omit all the tone control and feature switching and are recommended for the best sound quality. I indicate in the text, therefore, where I think there are significant differences between the two sets of outputs.

I used the Galo GFP-565 for a period of two weeks and, to say the least, was impressed. Its line-stage sound, via the Bypass outputs, was robust, with a good delineation of recorded detail. Stereo imaging was well-focused, the perspectives on my own recordings being reproduced with good depth delineation, though in absolute terms, the soundstage was somewhat foreshortened. This wasn't to a great degree, however—it was significantly worse via the Main outputs—and bearing in mind the Adcom's very competitive price, represents respectable performance indeed. On the
downside, the extreme treble was a little shut-in, lacking air, even though the mid-treble was, if anything, rather forward. The overall balance was therefore somewhat dark-sounding, with the subjective result that the music sounded rather over-polite, particularly via the '565's Main outputs, when it reminded me of the original version of the less-expensive GFP-555. Low frequencies were also rather ill-defined via the unit's Main outputs, and consistently tubby-sounding when compared with the '565's Bypass outputs.

To investigate this difference, I looked at the shape of a raised-cosine waveform (from the Japanese Audio Society Test CD, track 88) as reproduced by both outputs. It can be seen from fig.1 that the Bypass outputs reproduce the waveform extremely well, perhaps even better than when reproduced by the line stage of the expensive Mark Levinson No.26 preamplifier (fig.2). Via the Adcom's Main outputs, however, there is considerable overshoot on the negative side of the time axis (fig.3), which is presumably due to the coupling capacitor and which might well correlate with my subjective impression of less-well-defined lows. Note also that the Adcom's line stage is polarity-correct. I discovered, however, that switching in the Adcom tone-control stage inverted signal polarity, something to be aware of in A/B comparisons. I was also surprised to find that switching in its "High" filter gave a slight gain reduction (~0.85dB) at 1kHz. Obviously, purists should use the Adcom's Bypass outputs to get both the best bass and the most consistent performance.

I couldn't be particularly rigorous auditioning the unit's MM-only phono stage as I didn't want to change my regular LP-playing setup or introduce another variable by using a separate step-up transformer. Nevertheless, as the Adcom's phono input is incredibly quiet, there was only a very slight noise penalty and a restriction on maximum loudness with the Troika taken straight in. And the '565's phono input definitely sounded excellent with the output taken from the Bypass sockets. LP sound was clean, clear, and open, and lacking high-frequency grain. The piano sound on Käbi Laretei's superb Ingmar Bergman film music piano recital (Proprius PROP 7829) was as natural-sounding as I can remember having heard. Dynamics, too, were impressive via the phono input. The drum sound on John Hiatt's Stolen Moments album (A&M 75021 5310 II) was transient-rich, yet with the individual drum images set back in the soundstage, not unnaturally thrust forward. Check out "Child of the Wild Blue Yonder" for the manner in which the bass guitar is presented with excellent weight yet doesn't become confused with the bass-drum sound. This is definitely phono-stage performance to place this inexpensive preamplifier firmly in Class B of Stereophile's "Recommended Components."

For the first set of comparisons, I connected the Meridian 208's fixed-level outputs into the Mod Squad Line Drive Deluxe with one pair of AudioQuest Lapis, this connected to the Classic 60 via 10' lengths of Audio Research interconnect. The AudioQuest interconnects could also be connected to the Adcom's CD inputs, its outputs connected to the Line Drive and its volume control set to unity gain. With the CD player feeding the passive control center unit directly, the sound from this system was stunning. The soundstage was wide and extraordinarily deep. Robert Harley's guitar and
double-bass recording on the Stereophile Test CD has a fragile recorded ambience, yet the best systems throw a dome of subtle reverberation around the two acoustic instruments, both of which should be presented as lying in the same plane, slightly behind the loudspeakers. (Being present for the recording sessions gives an insight into the correct presentation of the recorded soundstage that’s hard to beat.) Such was the case with the Mod Squad unit, neither instrument being thrust forward and the chapel acoustic being apparent without exaggeration or loss. The main failing of this system was a slight reticence to low frequencies that manifested itself as a lack of weight to the double-bass sound.

Via the GFP-565’s line stage and the Main outputs, the perspective on the instruments became a little distorted, the guitar moving forward of the bass. The surrounding chapel acoustic was also suppressed, not to a serious degree but still noticeable in comparison with the direct feed. The Adcom’s low frequencies via its Main outputs were fuller, weightier than via the passive unit, but bass definition was a little compromised, the already soft attacks of the double bass—player Dan Kolton was stroking rather plucking the strings—becoming even less distinct. Using the Adcom’s “Bypass” outputs rendered the bass very much closer to the sound of the Mod Squad unit and brought back a degree of the hall acoustic, though the sound was still sweeter/darker than via the passive unit.

To put this performance into perspective, I have found this comparison to be cruel to any active preamplifier: the Adcom’s departure from neutrality from its Bypass outputs, while noticeable, was, in absolute terms, relatively minor.

I didn’t have access to Stereophile’s sample of the SP11 with which Gary had compared the 565; rather, I set up a comparison of the Adcom’s line stage with that of the $5035 Mark Levinson No.26, this time with either feeding the Classic 60 power amplifier. As might be hoped from its price, the Levinson preamp more closely approached the paradigm set by the Line Drive. Its soundstaging was as well-focused and only slightly less deep, the ambience on the Stereophile CD guitar and bass recording being only a little more reticent. Tonally, its sound was identical to the Mod Squad unit through the midrange and treble.

Its low frequencies were as well-defined, but had more impact, more weight, than the passive unit, to the benefit of the music. By comparison, the Adcom came over as more dark-sounding, which lent music a rather uninviting quality. Again, however, considering the Adcom’s price, it did very well in this comparison, its departures from perfection being both minor and subtractive.

Finally, I compared the sample of the GFP-565 that Gary reviewed with the second sample. If anything, the soundstage reproduced by the newer sample was deeper, with better presentation of recorded ambience. Other than this, there were no major differences, suggesting that the ’565’s qualities will be just as available to its purchaser as they were to the reviewer.

To sum up, the Janus-faced GFP-565 can either offer a Class B or a Class C sound, depending on whether its owner wants to use it as a basic, no-frills preamplifier via its Bypass outputs, or as a full-featured control center via its Main outputs. Its line stage is somewhat dark-sounding in absolute terms, though its low-treble balance did push some instrumental images forward. It has good midbass weight via its Main outputs, though its overall low-frequency performance lacks definition. Via its more transparent Bypass outputs, and particularly when used for LP replay, the ’565 offers superb sound quality, with well-defined low frequencies. Used as a basic, no-frills preamplifier, therefore, Adcom’s GFP-565 is a sonic bargain.

—John Atkinson

Adcom GFA-555 II power amplifier

Introduced in 1985, the original GFA-555 was the subject of a rave review in Vol.8 No.4 from the patrician Anthony H. Cordesman, who felt that its natural presentation of upper-octave detail and its "extraordinarily holographic" imaging might well make it a "legitimate rival" to the Krells and Audio Researches of this world. Three issues later, in Vol.8 No.7, the venerable JGH pretty much agreed that the ’555 was something special, rivaling his then reference, the Electron Kinetics Eagle 2. Personally, I felt the ’555’s high frequencies to be somewhat emphasized, perhaps even grainy, which for me somewhat offset its superbly defined, massively weighty low frequencies, its excellent dynamics, and its wide, deep, and
well-focused soundstage. It would also mean that the '555 required rather more care in the choice of matching source components and loudspeakers than AHC's original review would suggest. Nevertheless, the 200Wpc Adcom, priced at an eminently affordable $600, was superb value and went on to become one of the best-selling amplifiers of all time. Two Stereophile reviewers, TJN and RH, used '555s for much of their listening; and GL was also impressed by its virtues when he reviewed an early 1989 sample in Vol.12 No.12.

At the 1990 SCES, Adcom finally announced a revised version of the '555 to sell for $800, the GFA-555 II. Before continuing the amplifier's inclusion in Stereophile's "Recommended Components," therefore, I thought it a good idea to compare the new with the old (in this case, the same sample we had purchased for GL's 1989 review).

Superficially, the new '555 appears identical to the old. A closer look, however, reveals a greater number of cooling vents in the case and a cooling fan lying just under the top plate. (This fan, a $100 option, is triggered by heatsink temperature and didn't turn on during my auditioning, where average output levels were generally below 8V RMS into the 6 ohm Avalons—just under 11W.) There is now a red LED on the front panel labeled "Thermal Overload," a greater number of fuses between the rear-mounted, curved-edge heatsinks, and the input sockets are now much higher quality and use Teflon insulation. The power transformer has been increased in size, potted to improve heat transfer, and offers greater regulation. The output circuitry has also been changed, and the LF signal path has been stripped of polarized (electrolytic) capacitors. A new DC-servo circuit minimizes output DC offset.

Both amplifiers are polarity-correct, but the Mk.II version has slightly higher gain—27.75dB vs 26.9dB at 1kHz when loaded by the Avalon speakers. The 0.85dB difference was compensated for during the auditioning. Each amplifier was fed from a Mod Squad Line Drive Deluxe AGT via 1m of AudioQuest Lapis interconnect. Source was exclusively CD from a Meridian 208 CD player/preamp, connected to the Line Drive via 10' of Audio Research interconnect. Loudspeakers were Avalon Eclipses, bi-wired via 8' lengths of Mission spaced-conductor cable. (The fact that the Adcom's output binding posts are placed between the heatsink fins meant that there wasn't sufficient clearance to use the bi-wired sets of AudioQuest Clear that I used for the other follow-up reviews I carried out for this issue.)

The first difference wasn't hard to spot. After three hours' warmup, the heatsinks of the '555 II were appreciably hotter than that of the Mk.I, suggesting a higher degree of output-device bias current. The first track I played was Drew Minter singing Handel's "Va Tacito," from the Harmonia Mundi USA CD Arias for Senesino (HMC 905183). While I felt the older amplifier's high frequencies to be still a little grainy, it drove the Avalon speakers with a degree of authority that was musically satisfying. The voice was a little smaller-sounding than via the Audio Research Classic 60, which has taken pride of place in my system. Nevertheless, the soundstage was well-defined, the low frequencies weighty, and the music communicated well. Switching to the Mk.II '555 revealed an even deeper soundstage—the accompanying French horn could be heard to be set further behind Mr. Minter—while the voice was more robust in its midrange tonality. Turning to my recording of Anna-Maria Stanczyk playing Chopin on the Stereophile Test CD, the same differences manifest themselves. Via the original '555, the sound of the Steinway was a little lightweight, even "tinkly" in its upper registers, while the Mk.II '555 presented it with what I feel to be a more natural tonal quality. This is not to say the new amplifier is dark-sounding; instead, it has what I feel to be significantly less grainy high frequencies. It's fair to point out, however, that many listeners unfamiliar with the subtleties of live piano sound will prefer the original '555 as being more clear, more vivid.

The new amplifier again threw a better sense of depth than the old. Anna's Steinway was set further behind the plane of the loudspeakers, despite its now having a more robust, more forward midrange tonality.

Both amplifiers sounded pretty well equivalent in the bass with these kinds of music. I therefore reached for something with a bit more low-frequency oomph: Jeff Beck's Guitar Shop album (Epic EK 44313), which has some killer drum sounds. Here, the GFA-555 Mk.II had as good an LF extension apparent, but its upper and midbass registers were, depending on your tastes, better defined/less

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weighty than its Mk.I incarnation. Both, however, were more than adequate in presenting Terry Bozzio's thunderclap drum sound with more than sufficient weight and dynamic impact.

To sum up, I feel the GFA-555 Mk.II to be significantly more neutral as regards midrange and treble tonal quality than the Mk.I, while preserving its virtues: excellent imaging specificity, a deep, well-defined bass, and a superb sense of dynamics. Currently ranked in Class C of Stereophile's "Recommended Components" listing, the Mk.II '555 could well deserve an even higher rating. I have passed it on, therefore, to Tom Norton for a more detailed evaluation.

—John Atkinson

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...affordable audio for the critical listener.
Pianist Andrei Gavrilov talks with Barbara Jahn about making music in the cultural no-man's-land between the old and new Russias.

When, after 26 years of exile, Vladimir Ashkenazy was invited to return to Moscow to give two concerts with the RPO, he stayed with the young Russian pianist Andrei Gavrilov, who was to play Rachmaninoff's Second Concerto in the second of the two concerts. These historical events were captured on disc and given worldwide TV coverage. Gavrilov explained some of the background to this momentous occasion.

Andrei Gavrilov: We never knew, until the last minute, whether it would be possible to make these return concerts in Moscow; I was involved very much in their organization.

Barbara Jahn: You've recently recorded Rachmaninoff's Second Piano Concerto with Riccardo Muti and the Philadelphia. Why did you decide to play the same Concerto, knowing that it, too, would be recorded?

AG: We wanted to do a Russian concerto and we were undecided between Tchaikovsky, Rachmaninoff 2, and Rachmaninoff 3. We eventually decided to do Rachmaninoff 2 because it is a very Russian concerto. But they are absolutely different. The concepts are totally different. With Riccardo it was more my kind of concept of Rachmaninoff without any sentiment because I hate these sentimental clichés in Rachmaninoff. For me it's very direct, very straight, and very cool, like Rachmaninoff.

I hate these sentimental clichés in Rachmaninoff.
was himself. With Vova [Ashkenazy] we played it more... I won't say soapy, but more warm and emotional, probably because it was live and it was his return.

BJ: *What was the atmosphere at that concert?*

AG: Well, strange, I tell you. Of course, he was very, very welcome and there was enormous enthusiasm about his return, but it's such a mess now in the Soviet Union, so we were terribly busy with all kinds of organization. Vova was staying with his family at my house and we were very nervous about how the recording would go, whether the controls would work. In fact, they didn't work the first time, and we had a lot of trouble. You know, the revolutionary process is very nice to watch from afar, because it causes an enormous amount of disorganization.

BJ: *How did you rerecord a live concert?*

AG: We stayed afterwards and rerecorded. There were several electrical cutoffs during the recording and we had an agreement with the RPO for half an hour after each concert. It was very difficult, I must tell you. The first evening was even worse because Vova was playing the third Beethoven concerto and it was direct-broadcast through the satellite. Fortunately they started broadcasting three hours later, because, during the performance, they had a lot of electric cracks and noises on the tape and we couldn't find out what was going on. Only the next day they found out that the police who were guarding us were going back and forth, back and forth, over the cables and that was sending electrical cracks to the control room.

BJ: *It came across okay on TV...*

AG: But the situation was very tense because every five minutes after they finished the performance, the lady was appearing saying to the audience, "Please stay calm and don't leave until the intermission because we have electrical and balance problems."

BJ: *It must have been very difficult to perform under those circumstances.*

AG: Exactly. So when you ask how I felt at this historic time, I was laughing, because we didn't feel anything except total preoccupation with all the problems that occurred every single second.

BJ: *Why do you say that these problems are a direct result of what is happening in Russia at the moment?*

AG: Because nothing is working. They destroyed the old-command administrative system and didn't develop the new system, and there is no free enterprise, no new plans. You call for the car, it doesn't come. You fix a meeting and people don't come because they can't manage. You order hi-fi and it doesn't arrive on time.

BJ: *So things really aren't that good after all?*

AG: [*laughs*] Not at all, not at all. It makes me very angry. These people are so enthusiastic but the situation is not that simple—people have no idea what's really going on. The situation is pathetic: there is no food, nothing is working, and the government is hopeless—they can do nothing, nothing to help. They have no economic plan, they are trying to revitalize the system with old tricks, which doesn't work. It never worked in Hungary and Poland and East Germany; I don't know what they are thinking about. That's why I have moved now with my wife to Europe, to a very calm part of West Germany.

BJ: *When was that?*

AG: After New Year. We were mostly in Europe for the last five years, but now it is totally impossible to live in the Soviet Union.

BJ: *It's interesting that you've moved away just when things are supposed to be improving.*

AG: Exactly. I was fighting for these things all my life—to break the Iron Curtain—and actually I was the first who succeeded in going back and forth and making it possible for musicians and artists to travel freely and live abroad without any problem. It was an enormous fight. I gave all my life to this, and when I achieved it I decided that it was enough, that my political duties were fulfilled, so I deserved some calm time.

BJ: *When did this free movement become possible?*

AG: In '85, since I wrote to Gorbachev. I was stuck in Russia from '82 to '84 and it was an enormous struggle between me and the government because I was ready to open the fight with the whole system, the Minister of Culture and directly with the Government. They almost physically eliminated me. But I succeeded and I wrote to Gorbachev asking if I could stay in London for about a year to promote my career, which was enormously destroyed, and we got a reply, not written, but directly from him, that we could do it. Then I realized one year was not enough, so I asked...
for another year, and he was positive about that too. Since then, other Soviet artists have found it easier. The easiest thing is to break with the country and just throw out the red passport, with which it is impossible to travel, but I didn’t want to do that after such a huge investment in this fight.

BJ: And you didn’t feel that you wanted to get away before that?
AG: I couldn’t! I just couldn’t. I was almost under house arrest. It was a very difficult time. Maybe one day I will write a book about it, and it will be a thriller!

BJ: Were you contemporary with Mikhail Rudy?
AG: He is three or four years older and I met him when I was in the first course of the Moscow Conservatory; he has in the fourth and almost finishing. I only know that he was involved in some way with the KGB—it was quite a strange situation—and then he disappeared. [Predictably, Gavrilov refused to be drawn on this. —BJ]

BJ: How were things at the Conservatory?
AG: I’d just entered and I had an order to take part in the Tchaikovsky Competition, as it usually happens. Vova had an order too. I wanted to enter the Competition, but in ’82, that was my plan. I had just finished Central Music School and graduated. That was very difficult; there were a lot of exams. Then I had entrance exams for the Conservatory, which were exhausting, and then I wanted a rest and some peace to learn things, but I had an order, the same year, to take part in the Tchaikovsky Competition. So I had to take part and, unexpectedly, I won. I was 18 years old and very unprepared. The order came from the old Minister of Culture, Madame Furtseva, a very dictatorial old lady, and I had only two months to prepare the program. I knew there was already a big Russian team of about 10 or 11 people chosen for the Competition. It included Dimitri Alexeev and many other famous people. Alexeev was pre-planned as the first prize. You know, Soviets are usually preparing prizes for this, because it is very political. It is horrible, but it is so. I was just another young boy taking part. But unexpectedly Alexeev was not so good in the second round.

BJ: And it went in your favor.
AG: Yes.

BJ: Alexeev [who is older than Gavrilov and still lives in Russia] told me he is quite happy

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AG: It depends on character. You know, many people can cope with the system and this is the big fault with the Russian character: they are used to obeying. They find their ways to avoid difficulties and then it hits back at the Art. I couldn't name any great artist from Russia in the last 10 or 15 years. I think the greatest pianists were Emil Gilels and Sviatoslav Richter; I think it is very much connected with this loyalty to this awful system. I was always openly against it, since I can remember, maybe because of my family. I was raised in a totally different way. My father was a painter and he was very strong and independent. My mother was the same and raised me as a strong, individual person, with my own views.

Then there are all the lies. The propaganda works when you are six or seven, but when you're 10 and 12 you already see that there is something wrong in your country. They start to teach you this legend about two worlds, one black and one white, the capitalists and the socialists, and teach you to hate the rest of the world that is not in your system. Then come Solzhenitsyn's books and you see what's going on.

BJ: You and Ashkenazy are kindred spirits in denouncing this way of life.

AG: I wouldn't say he was fighting against the system because he just got out, which was good for him because he saved his life and his nerves and his health. I lost everything because I was fighting. [laughs]
BJ: You were ordered to enter the Tchaikovsky Competition. What would have happened if you hadn't won it?
AG: I would have gone on learning in the Conservatory and I would have tried myself somewhere else, like the Brussels Competition; everyone from the Conservatory goes there, wins it, then just disappears!

BJ: So how did winning it help you?
AG: It was a good jump to the concert podium, and there was a chain of coincidence in my career. I unexpectedly won this competition and then I was so exhausted with exams and the competition preparation that I flew to the Black Sea, which is my native country, to get some sun and swim a little bit. Two days later I got a telegram saying you must go to Salzburg because Sviatoslav Richter is ill and you must play the concert. So again, I was ordered; I flew to Salzburg and it was a very, very big success and after that I got a lot of engagements. That was in '74, two weeks after the Tchaikovsky competition, and it started my career.

BJ: What was your training like at the Conservatory? I know you've recorded Bach, but many Russian artists have told me that they found German composers difficult to understand until they came to the West.
AG: That was also very funny, because I had a German teacher and I was trained in a very Classical way. All my life I was playing Bach, Beethoven, and Benda, all sorts of things, and suddenly after the Tchaikovsky competition I was thrown into this Romantic repertory. I was labeled a Romantic interpreter, and I was playing pieces that I hated. Vova hated the Tchaikovsky Concerto—I never hated it, but it was absolutely not my cup of tea. But I had only invitations for this kind of music: Liszt, Prokofiev, Rachmaninoff, no Classics. Only now am I coming back to what I really want to do, all Beethoven sonatas and concertos, all Mozart, and Bach, which is my favorite. I developed a special technique for Bach, and I've always dreamed of doing it. As soon as I've finished my plans with EMI for next year, I'll be doing mostly Classical.

BJ: Was it your teacher who inspired you to take up this repertoire?
AG: Oh yes, definitely. You need a certain kind of mentality to play this music. Russians usually can't cope with it because they have this mysterious "Russian Soul."

BJ: Ashkenazy said he had to come to the West to learn how to play Beethoven and Bach.

AG: Yes, because he had completely different teachers. I was studying in the same room as he in the Central Music School, it was funny because above my piano was his photo—his teacher, in spite of all the problems and the fact that she was forbidden, kept it there as a reminder. I always watched him while I was practicing and never thought that we would eventually work together and have similar routes. His teacher was very emotional, very Russian-style, and that's probably why Vova had to learn this architectural structure of the Old Schools later on. My teacher hated Russian
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BJ: How did she manage to stay at the Conservatory?

AG: I don’t know. There were a lot of Germans before the revolution, and there were a lot of German musicians with a very traditional German school who remained after the revolution. So I was very lucky because I had a strong temperament and it was good for me to have this kind of teacher.

BJ: I read in an interview you gave some years ago that you like to record in very short takes. Is this still true?

AG: It depends what I am working on. When I was doing the Chopin piano studies it took a while and, until recently, my recording was of the Romantic repertoire, very difficult technical stuff, so I wanted to get the best result because recording is a document and it is very important to leave a document that reflects what you can do. I am very precise in what I am doing and it takes a while. But it changes. Sometimes I’ll do one take, but it’s not always possible with all these modern standards. I hate this sterilized recording, without one wrong note or noise, and it is difficult with digital microphones and machines. I think stereo is pretty enough for our two ears. I still don’t think they can cope with producing the real sound on digital machines. All the sound to me is artificial. The only recital which sounds like me is my Scriabin recital [Angel/EMI CDC 47346], which Chris Parker produced, and he got a very good sound. Mark Vigars also does a good job, but there are not many successful recordings with digital machines—they are too sophisticated and too sensitive. So until now I haven’t been satisfied.

BJ: So will you rerecord?

AG: If they invent something more natural, because sound is very important for most composers, but most of all Chopin; it should be crystal, leggierissimo, legatissimo, and it all disappears on the digital recording; you have a kind of skeleton without a body of sound. It’s not what we hear in the concert halls. How can you do a foggy sound with a digital machine if it will clean up all the fog automatically?

BJ: So how do you feel about concert performance? Is it preferable?

AG: Absolutely. If you are doing a lot of recordings, you must obey the policy of the company. They want things that will sell well, that are commercial. For example, if you want to do the complete Haydn Sonatas, they say, “Oh no, they won’t sell. Do the Transcendental Studies again or the B-minor Sonata.” So, again and again, circumstances provoke me to do things that I don’t want to do.

BJ: Will you be able to record the Beethoven Sonatas?

AG: I don’t know, because everybody is doing them. There’s big competition so they won’t sell well. [laughs] They are very simple arguments. It’s the same with the Beethoven Concertos. There are things that few people can play technically, like Rachmaninoff stuff, like Prokofiev Concertos, especially the Second, or the Liszt Transcendental Studies. EMI wants these things from me and I don’t mind, but they should be in a good balance with things that everybody else is doing. Not everybody is doing them perfectly!
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BEETHOVEN'S THIRD SYMPHONY, THE EROICA

Mortimer H. Frank

"If I write a symphony an hour long, it will be deemed short enough." Thus replied Beethoven to complaints that the "Eroica" was too lengthy. Still, he was sufficiently pragmatic to recognize the exceptional demands his new work made, and when it was published, he added a note on its title page suggesting the symphony be played at the beginning of a concert before the audience became tired.

The original manuscript bore the inscription, Grand Symphony entitled Bonaparte by Louis Van Beethoven. But when Napoleon declared himself Emperor, the democratically-minded composer—in a fit of anger—scratched it out, subsequently retitling the work Sinfonia Eroica, Composed to Celebrate the Memory of a Great Man.

Today, of course, we find the "Eroica" less demanding than did Beethoven's audience, and take its revolutionary traits for granted; so much so, in fact, that we may lose sight of its rightful place in musical history. Obviously, in terms of length, harmonic vocabulary, thematic development, and innovations in form, this symphony broke new ground as none before it ever had. Indeed, its finale—made up of bass, tune, some fugues and variations—remains structurally unique in the symphonic literature.

At the same time, for all of its innovative strokes, the "Eroica" honors tradition. Its opening movement is simply an expansion of the sonata style favored by Haydn, its Funeral March a rondo, and its finale, while innovative in structure, an outgrowth of the Classical variation style in which harmonic reiteration is an organizing principle. What's more, the scoring of the work expands upon the orchestra favored by Haydn and Mozart only to the rather timid extent of adding a third horn. In short, the "Eroica," for all of the many ways in which it seems to have opened the door to the 19th century, remains a product of the 18th and a prime example of the ostensibly iconoclastic Beethoven displaying his respect for tradition.

It is in this apparent conflict between the music's traditional and revolutionary features that the major interpretive problems lie. On the one hand, performances must stress its grandeur, solemnity, harmonic boldness, and heroic breadth. But these traits cannot be italicized at the expense of balance and clarity: Too much weight will blur the music's texture, too much freedom will collapse its structure, and...
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excessive breadth in the name of solemnity and grandeur will neutralize requisite momentum.

Over and beyond these general points, the score raises special problems with respect to Beethoven's Urtext. Today, for example, the majority of conductors feels obliged to include a first-movement repeat, the prevailing notion apparently being that if Beethoven wrote it, he wanted it. This attitude smacks of a blind fundamentalism that ignores common sense and historical context. Obviously, when Beethoven specified the repeat, he could not have anticipated the phonograph and its allowing of repetitions at will. Furthermore, the repeat makes the movement disproportionately long and is thus aesthetically redundant.

The other problem involves Beethoven's scoring in the first-movement coda, where, owing to the limitation of the trumpet of his day, the entire main theme could not be reiterated at the point where that reiteration is most needed—at its climactic re-emergence. Most conductors, recognizing this and assuming that Beethoven would have acted differently if not constrained by the limitations of the instrument, give the entire theme to the trumpet, thereby strengthening the movement's close; clearly, a wise choice.

Unlike some of the other Beethoven symphonies, the "Eroica" did not gain a great number of distinguished recordings during the 78rpm era. One of the best, made by the New York Philharmonic under Mengelberg, dates from 1930 and was once available on a Japanese RCA LP. The only 78rpm recording to include the first-movement repeat, it is somewhat eccentric but richly expressive and grandly heroic—a more stylish performance than the somewhat more mannered account Mengelberg recorded with the Amsterdam Concertgebouw Orchestra in 1940, currently available on a poorly transferred Philips CD (416 201-2). Once broadly circulated on a Vox-Turnabout LP reissue, Weingartner's 1935 effort—lean, propulsive, and animated by pointedly flexible rhythm—is one of that conductor's finest Beethoven recordings and one well worth grabbing when it turns up in secondhand bins. Remarkably similar in conception, even to the observance of the Urtext in the first-movement coda, is a 1953 Erich Kleiber recording (London CD 414 626-2; like Weingartner's, with the Vienna Philharmonic). Both performances attest to how conductors of the German-Austrian tradition did not (contrary to stereotyped views) favor thick textures and broad tempos. In fact, the typically bigoted critic might call them "too Italian."

Such was the narrow inventive sometimes directed against Toscanini's "Eroica." It may surprise some to learn that the Maestro left three recordings of the work, two—1939 and '53—produced in concert, the other, 1949, in studio sessions. All, in divergent ways, reveal Toscanini as one of the score's most sympathetic interpreters. Here is the music's emotional range in all of its dramatic sweep, its texture in sharper focus than in period-instrument readings, and its heroic grandeur developed with cumulative power unmatched by most other conductors. Only the 1949 recording is currently available (RCA CD 60653-2-RG), easily the best transfer the performance has received. The least inflected of Toscanini's three recordings, it boasts his broadest account of the finale and a legato statement of the main theme by the trumpet at the close of the first movement that is one of the marvels of the phonograph.

Scheduled for reissue by RCA are Toscanini's two other recordings. A sonic horror in its 78rpm release, the 1939 account was available in superior sound in a now out-of-print Franklin Mint LP, and it is the source of that transfer—17", 33rpm acetates recorded by NBC engineers—that will be used by RCA in its CD reissue. This is the most rhythmically free and emotionally intense of Toscanini's three recordings, and one that may well leave the listener limp. The 1953 account, the conductor's last performance of the work and one featuring the best sound, strikes a balance between the freedom of 1939 and the relative rigidity of a decade later, while maintaining many of the distinguished features common to all three. Also worth noting is a live NBC performance from 1938 issued on Music and Arts Programs CD-264. Sonically restricted, it is very similar to the 1939 reading, but with a slightly broader Funeral March and a less carefully phrased first-movement coda.

At the other extreme of the interpretive spectrum is the widely admired Furtwängler recording of 1952 (EMI 63033). Weighty, expansive, and rhythmically very free, it still suggests much of the music's innovative grandeur and harmonic boldness. And it's very well recorded for its vintage, capturing the resplen-
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dence of the Vienna Philharmonic's horns. Even more compelling, if less sonically alluring, is a live 1944 Furtwängler preserved on a Price-less CD (D-16395). Here the pace is slightly faster, the rhythmic freedom less extreme, while the weight and sharply defined harmonic motion of the 1952 version remain.

With stereo more than three decades old, many two-channel recordings qualify as historic and feature the names of giants who were active for all or nearly all of the first half of this century, notably Klemperer, Monteux, Walter, and Scherchen. Klemperer's "Eroica" (Angel 47186) has gained praise that I find confounding. One may admire the polish the conductor secures from the Philharmonia Orchestra, and there is a certain cumulative force to his unflagging rhythmic rectitude. But the pacing is labored and makes Beethoven's hero into something of a middle-aged straggler suffering from tired blood. Walter's effort (Odyssey MBK-42599), with an undeniably pick-up ensemble, is also disappointing. Interestingly, both Klemperer and Walter produced more incisive monaural recordings, neither currently available. Still, from an interpretive (though not sonic) standpoint, Walter can be heard to better advantage in a live 1957 performance with the Symphony of the Air (Music and Arts CD-1010).

A truly looney "Eroica" was recorded in 1958 by Scherchen (part of a two-CD set also including the conductor's accounts of Beethoven's Symphonies 1, 6, and 8, MCA D2-9802). This is not for every collector, and one's first response to Scherchen's outlandishly fast tempo is disbelief. Yet it is interesting to consider the clarity and lightness of the performance in the context of the "Eroica"'s proximity to the 18th century. As Scherchen conceives the score, it might well have been written by Haydn.

Far more conventional are the recordings of Szell and Monteux. The former's (CBS MYK 37222) is in every way commendable: unman-nered, transparent, and suggesting the way in which the work straddles two disparate centuries, it is very much in the Weingartner/Toscanini/Kleiber mold, but without the degree of emotional intensity that makes their readings so gripping. Thirty years ago, Monteux was not considered an eminent Beethovenian, yet, in retrospect, his traversal of the composer's symphonies commands considerable respect. He recorded the "Eroica" twice, with only the later (and superior Amsterdam Concertgebouw) version currently available. Better disciplined, more propulsive, and boasting greater clarity than his VPO edition, it is distinguished by an exceptional command of voice leading that makes it the only version I know to make a convincing case for following Beethoven's Urtext in the first-movement coda. A bonus on this CD reissue (Phillips 420 853-2) is Monteux rehearsing the Concertgebouw in the Funeral March, where he is a model of the supremely competent professional. The excellent sound of the original LP, unfortunately, has been compromised by the harsh "NoNoise" digital transfer.

Probably now qualifying for historical status is the Schmidt-Isserstedt account recorded in 1966 with the VPO (London 421 024-2). I have seen it in some stores for as little as $5.95, and it is one of today's greatest bargains. The overall conception is another that defies the nonsensical generalizations about German performances. Here is a generally propulsive, detailed reading, free of excessive weight, that clarifies all the key strands of the music's texture. At its modest price, this is a steal, especially in the light of its tight, well-focused sound.

Among more recent editions, the quality varies. Thoroughly unattractive are those of Abbado (DG 419 597-2), Mehta (CBS 35883), and Muti (EMI 49490). In varying ways, each of these performances, in its faceless neutrality, offers cogent evidence to support the notion that our musical culture's saturation with the standard repertory has led to a homogenized approach utterly wanting in character and profile. It's not easy to drain the power and drama from the "Eroica," but each of these performances has managed it with astonishing success.

Somewhat better, though hardly inspired, are the efforts of Haitink (Phillips 420 538-2), Sanderling (Angel 69201), and Solti (London 421 673-2 DM6). The 20-year-old Solti edition is available only in a six-CD set devoted to his old cycle of the Nine. In its attempt to reconcile weight and clarity, it manages only to achieve neutrality. Sanderling, in his excessive

1 It's a favorite of mine, particularly the "Funeral March," which reminds me of a stiff-legged, New Orleans-style marching band. But maybe I am reacting against the current, overfamiliar school of "Eroica" performances from conductors who seem just too young to be allowed to conduct it all at once alone record it. —JA
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breadth, simply lacks animation, and Haitink seems to view the work as a study in moderation and its composer as a middle-of-the-road conservative.

Equally lacking in stature are the readings of Thomas (CBS MK 44516) and Marriner (Philips 410 044-2). Both employ relatively small ensembles, closer in size to those favored by authenticists. What is often lost in weight with such reduced forces can be compensated for by a gain in overall clarity, but not in these recordings. Indeed, with considerably larger forces, many conductors have produced even greater clarity while managing to project more weight, not only some greats of the past already cited, but, more recently, Kegel, Wand, Dohnányi, Bernstein, and Karajan.

Superficially, Kegel's "Eroica" (Capriccio 10021) conforms to the stereotype of the central-European conception. His Dresden Philharmonic is an able but not especially virtuosic group; tempos are, of themselves, conservative, and the overall sonority lacks the richness and color produced by some world-class ensembles. But the conductor's musicianship—his command of line and structure, his sense of where the dramatic plateaus should rise, and his ability to draw intelligent inferences—triumphs over these potential shortcomings. Particularly worth noting is the first-movement coda where, with trumpets added to the final peroration, Kegel manages an unbroken statement of the main theme while suggesting the texture of Beethoven's original scoring. And from a purely sonic viewpoint, this edition, with its wide dynamic range, exceptionally natural timbres, and exemplary balances, is among the best to be had.

Even more commanding musically is Wand's performance, recently reissued on a mid-priced CD (RCA 60093-2-RC). Here again is a central-European orchestra (North German Radio Symphony), hardly the last word in virtuosity, finesse, or color, following a conductor whose tempos fall into a rather neutral area. But the performance is energized by potent accents and a care for detail that convey the music's grandeur and urgency. The forte entrance of the first movement's main theme, for example, has never sounded more animated, not because Wand accelerates when it appears, but simply as a result of his paying strict attention to Beethoven's dynamics and permitting them to erupt with due force. The only blemish on this performance is an inclusion of the first-movement repeat. Nevertheless, as a mid-priced edition, it is especially attractive.

In the Cleveland Orchestra, Dohnányi has one of the world's great ensembles, and with it he produces one of the best "Eroicas" available (Telarc CD-80090). Aside from an und dormant acceleration in the Trio of the Funeral March that weakens the music's impact, everything about this performance is distinguished: its opening E-flat rifle shots; transparent sonority; and propulsive first and third movements, balanced by a broader-than-usual finale. And the in-tempo, virtuosic execution of the Cleveland horns in the fleet third-movement trio is breathtaking. Add to these virtues an exceptionally wide-range, natural recording, and the total produces a preferred edition for those who favor a generally lean, lithe "Eroica."

When one of our most celebrated conductors' second recording of the "Eroica" appeared in 1980, it marked what seemed to me his transition from Broadway Lenny to maestro Bernstein. In part, this impression was rooted in the dreadful LP mastering of his initial mid-'60s recording with the New York Philharmonic. As heard in a CBS CD reissue (MK 42220), the sound is far more musical, the performance consequently more appealing. But it remains less taut, colorful, and tonally attractive than the conductor's splendid remake with the Vienna Philharmonic. Propulsive yet never rushed, richly detailed and free of mannerisms, it is one of the best to be had, especially in its CD format (DG 413 778-2). In some quarters, the in-concert recording has been criticized for being muffled; this judgment, though, strikes me as coming from ears too conditioned to recorded rather than live sound. In its relatively distant perspective, this is one of the few recorded "Eroicas" to suggest the ambience of a front-row balcony seat, and from its opening whiplash chords, the performance blends weight, clarity, rhythmic suppleness, and tonal richness in an effort that stands as one of Bernstein's finest achievements in the Classical repertory. But I wish he had omitted the first-movement repeat.

Karajan has made more studio recordings of the "Eroica" than any other conductor: four in all, three in stereo with the Berlin Philharmonic and a monaural version with the Philharmonia Orchestra. The two earliest of these, the 1953 Philharmonia and 1962 BPO remake,
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are available only in complete sets of the Nine (EMI 63310 and DG 429 036-2, respectively). In the main, both performances comprise solid, unaffected efforts boasting gorgeous orchestral playing but lacking the vibrancy and intensity of the best interpretations.

In his 1977 version (DG Galleria 419 049-2) Karajan's viewpoint changed radically, almost as if he had decided to ape Toscanini. The result, however, is merely glib and slick, as if Karajan were skating across the music's surface, ignoring what lies beneath. But in his final effort of 1983 (DG 415 506-2), the conductor produced a synthesis of the best of everything he had done previously. Here the music is propulsive without glibness, weighty but never heavy, and stamped with a heroic grandeur made all the more expressive by the tonal richness of the BPO. In a world that often scorns old age, this recording is a cogent reminder of how advancing years need not be equated with dotage.

Requiring special consideration are the five period-instrument performances currently available. Although different from each other in a number of ways, all share several features: pitch slightly lower than normal; inclusion of a first-movement repeat; observance of Beethoven's Urtext; and ensembles no more than half the size of a modern symphony orchestra and featuring nasal, vibrato-free strings, piquant winds, and biting, almost astringent brass.

Among these five editions, that led by Norrington (Angel 49101) has probably received the widest praise, mainly for the freshness of its timbres and the originality of a conception that hews closely to Beethoven's metronome markings. Some tastes, however, may find the timbres more rude than fresh, and annoying in their coarse, at times even ugly, sonority; in short, they are no more musical than the expressionless, unaffected pacing that Norrington favors. If his tempos prove anything, it is that the metronome is a machine and not a musical instrument. Goodman's "Eroica" (Nimbus NI 5122), if less eccentric, falls by the wayside by virtue of its inferior ensemble.

Considerably more interesting, if not ultimately successful, are the readings of Brüggen (Philips 422 052-2) and Hogwood (L'Oiseau-Lyre 417 235-2). Brüggen is the one period-instrument conductor whose interpretive decisions seem to grow more from musical considerations than from fundamentalist literalism. Here, though, he sounds thoughtful to the point of being mannered, his interpretive gestures distending line, damaging structure, and denying the music a requisite momentum. Hogwood's performance suffers from rhythmic rigor mortis, doubtless the result of the absence of a guiding hand on the podium, Hogwood "directing" from a fortepiano, the presence of which in a work of this emotional scope and weight seems ludicrous. To compensate for the rigidity, Hogwood produces some expressive timbral shadings, and with an orchestra of 47 players (including four horns rather than the three Beethoven specifies) manages to suggest surprising weight and structure, in good measure through the relatively broad tempos he favors. Among period-instrument readings, this one (superbly recorded, by the way), if no match for the finest modern-instrument editions, holds up best to repeated hearings.

But perhaps the most interesting (if not enduring) period-instrument version is that of Jaap Schröder (Deutsche Harmonia Mundi 77030-2-RC). It features the leanest sonority of all, one that probably most closely approximates what was heard at the premiere of the "Eroica"—a private performance given by an ad hoc group of about 30 players at the home of Beethoven's patron, Prince Lichnowsky. The tempos are fleet, the rhythm (as with Hogwood) rather rigid, but nothing is unmusical (as with Norrington) or clumsy (as the Brüggen), and the overall execution is far more polished than with Goodman's group. And it certainly must be light-years superior to what took place in the Prince's home. In the main, though, Schröder's account is more valuable as a well-recorded attempt to resurrect history than as a satisfying musical experience.

In the long run, of course, the "Eroica," like any great work of art, defies a single interpretive view. Even the same conductor, if thoughtful, will invariably alter his conception of the work from one performance to the next, as is attested by some of the recordings discussed. And as listeners, our tastes and responses may also change. The key point is that hearing a wide variety of approaches to such a work deepens our perception of its mysteries and marvels. And that is why there may be something to be learned even from recordings that here have been deemed least satisfying.

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Bernstein's new Mahler Sixth—no less great than his first recording of a quarter-century ago.

Tchaikovsky was venturing into uncharted territory when he undertook to write a Piano Trio, but, nevertheless, the work was completed in three months and "dedicated to the memory of a great artist," his friend but most severe critic, the great pianist Nicolai Rubinstein. Not surprisingly, the piano takes the lion's share, and has all the demanding technique of a concerto, thus creating a work of unequal balances that requires the utmost sensitivity of its performers to make it gel.

Arensky, trained by Rimsky-Korsakov and later Rachmaninoff's Professor of Harmony and Counterpoint at the Moscow Conservatory, was a friend of Tchaikovsky, who, in turn, acted as his critic. Tchaikovsky tended to encourage the young composer, having the greatest admiration for his talents, and it was thanks to his inspiration that Arensky composed his ardent and lyrical Piano Trio. This he dedicated to the eminent cellist/composer Karl Davidoff, endowing the cello part with the best tunes while restraining it, more successfully than Tchaikovsky had done, within the bounds of the chamber-music ethos.

The three performers on this disc treat both works with the greatest respect. Their playing is of the highest caliber, their passionate involvement sheds a radiance that warms and enfolds the listener in an atmosphere of euphoric well-being. If the nature of both works and the recording tend to highlight them as individuals, their performance shows them capable of intuitive ensemble and a singularity of intent. The Beaux Arts Trio's reading of the Tchaikovsky (Philips 422 400-2) is much darker in tone and character, an equally valid interpretation but not one that I prefer in the light of this genial account. And, with the Arensky thrown in for good measure, this Delos disc is quite superb value for money.

—Barbara Jahn

BEETHOVEN: Symphonies 1 & 6
Fritz Reiner, Chicago Symphony
RCA 60002-2-RG (CD only), Lewis Layton, eng.; Richard Mohr, prod. ADD. TT: 63:39

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other late-19th and early-20th-century music, listeners and critics alike tend to take Reiner's Beethoven for granted. In his own generation, as well as those which overlapped and followed his, there seemed no shortage of alternatives. From Weingartner, Furtwängler, and Toscanini to Walter, Klemperer, Szell, and Karajan, we have more than enough definitive Beethoven performances whose multifaceted merits continue to arouse debate and admiration. In combining unauthorized as well as authorized recordings, certain of these conductors weigh in at complete cycles several times over. RCA's proposed Beethoven cycle for Reiner/CSO never materialized. With this reissue of 1 and 6, along with the previously reissued 5, 7, and 9, we have only his 1954 "Eroica" still in the vaults, the most short-lived of all the Reiner/CSO Beethoven recordings, and to some of us who know it, perhaps the best of the lot.

In the meantime, these two performances, whose basic premises could be debated, nevertheless tell us something quite fascinating about Reiner's approach to Classical and Early Romantic repertoire: clarity of line and texture which would not be heard again until the Original Instrument people got started, and this with a modern orchestra. It must be stated that despite the reputation he enjoyed in his own time for objectivity and a literal, faithful, to-the-letter approach, one hears in retrospect the interpretive liberties of rubato and dynamics of which he was fond, and that he was not above changing the orchestration at times, although his forays into this realm were fewer, more subtle, and far more effective than those of most of his contemporaries.

Symphonies 1 and 6, as well as 9, were recorded in April and May 1961, after Reiner's return from a heart attack which had removed him from all but the final weeks of the 1960/61 CSO season. Symphony 6 concluded the concert which marked his return to Chicago, no longer sleek and plump, but gaunt and pale as he shuffled on stage in a baggy suit. But he demonstrated from the outset that, even in failing health, he could command the orchestra to sound in a unique style all his own, and to renew the oft-heard Beethoven score. Of how many conductors today can one make that statement?

That said, this "Pastoral" may not be everyone's taste. Those who think of this work as a tiptoe through the spring zephyrs with a passing storm may find this performance a little too serious and far more autumnal than vernal. Reiner obtains more than the modicum of expressive playing from the CSO, and that of the woodwind principals is of especially high caliber. Tempos are on the slow side, but steady pulse (a Reiner specialty) keeps things moving at all times. The most controversial aspect of this performance is the very slow scherzo, with the repeat omitted. The storm is the most ferocious I have ever heard. At the performance the timpanist used wooden mallets (actually in accord with early-instrument practice), though in the recording it sounds like the approach has been moderated to covered, albeit very firm, mallets. In any event, this is the most truly thunderous timpani playing I have ever heard in this piece, live or on recording.

Symphony 6 was issued in Britain in 1963, a year prior to its US release, in which it was touted to be Dynagroove and issued as part of an extravagant coffee-table book of pastoral art. I never heard the British pressing, but the US one had all kinds of problems: overloading, bad fill, and a lot of things which Dynagroove was supposed to address but didn't since Dynagroove was hardly more than an album sticker for the gain-ridden. Don't worry about Dynagroove. If your attempts to find a good-sounding vinyl pressing of this recording have met with frustration, you might as well get the CD.

Symphony 1 was originally side 4 of the 2-LP Beethoven 9 set. Mine was an off-center pressing, but this followed several exchanges related to pressing problems with the 9th. Remember what that used to be like? In the vinyl issue of Symphony 1, the big woodwind tuttis were blurred. On the CD, they're clear. The common high-end wisdom is that the original all-analog vinyl is superior to the CD conversion. Ponder some uncommon wisdom.

As with 6, tempos are on the slow side, and there are feelings of seriousness, even melancholy, which are not usually associated with either work. Is it Reiner's confrontation with mortality, or merely the effects of medication? In any case, hearing these performances reminds us, yet again, how little today's conductors have to say about Beethoven, whatever type of instruments are used, regardless of their health, or whatever drugs they're on.

—Richard Schneider

BRAHMS: Piano Concerto 1; Variations on a Theme of Schumann
Andras Schiff, Georg Solti, piano; CSO, Solti
London 425 110-2 (CD only). James Lock, eng.; Christopher Raeburn, prod. DDD. TT: 65:34

With its snarling horns, pulsating trills, powerful accents, and sharply delineated texture, Solti's account of the orchestral portions of this highly symphonic concerto is as fine as any. Certainly it underscores the youthful brashness, even defiance, that is so much a part of music, which, amazingly, was composed by a Brahms barely out of adolescence. Schiff's ap-

Stereophile, October 1990 231
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proach is less assertive, more nominative, stressing little of the work's eruptive boldness and focusing instead on balance and lyricism. Surprisingly, this view is made to complement (rather than run counter to) Solti's. In effect, what results is a superb protagonist-antagonist drama, which is, after all, what a Classically styled concerto is all about. And Schiff's playing, *qua* pianism, is magnificent: tonally opulent without so much as a hint of clang, and colored by all sorts of subtle shadings that are at once virtuosic and musical. What's more, generally expansive tempos in outer movements permit him to bring out all sorts of detail lost in other readings. Particularly impressive is the close of the first movement's recapitulation as it melts into the coda: rarely have I heard this passage sound so gorgeously hushed and tender, providing a perfect foil for the explosive close that follows. And the great *Adagio* is especially touching in its unaffected simplicity.

The relatively unfamiliar, four-hand *Schumann Variations* are superbly projected by Schiff and (pianist) Solti. They bring out the emotional contrasts between variations while clarifying the harmonic backbone that unites them. In sum, then, a somewhat unorthodox view of the concerto that is well worth investigating and that provides a fine change of pace from the more familiar readings of Rubinstein/Reiner (RCA), Serkin/Szell (CBS), and Pollini/Böhm (DG).

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**HOWARD HANSON: Symphonies 1 & 2, Elegy in Memory of Serge Koussevitzky**

Gerard Schwarz, Seattle Symphony

Delos 3073 (CD only). John Eagl, eng.; Amelia S. Haygood, exec. prod. DDD. TT: 70:39

**WALTER PISTON: Symphonies 2 & 6, Sinfonietta**

Gerard Schwarz, Seattle & New York Chamber Symphonies

Delos 3074 (CD only). John Eagl, eng.; Amelia S. Haygood, exec. prod. DDD. TT: 66:55

During his years as principal trumpeter of the New York Philharmonic, Gerard Schwarz paid more than the usual attention to what was happening on the podium. Indeed, after embarking on his own podium career he told me during an interview that in some respects the experience was similar to a series of conducting (though not necessarily master) classes.

"You always know where the problems in a score are," he noted, "and it was a real learning experience to see how the various conductors who came through solved—or didn't solve—those problems."

Clearly, Schwarz learned well, and as music director of the Seattle Symphony for the past six years he has transformed a very good orchestra into one of major accomplishment. If, as evinced on these recordings, the strings still lack the ultimate in sheen, the ensemble's overall sound is lustrous and full-bodied, with exemplary contributions from winds, brass, and percussion. In common with most 20th-century music, the works contained on these releases (particularly those of Piston) require rhythmic security as well as subtlety—qualities Schwarz and his colleagues possess in abundance. The New York Chamber Symphony (over which Schwarz has presided for 13 years) turns in an equally impressive rendering of Piston's *Sinfonietta*.

These CDs form the initial entries in Delos's "Great American Composers" series, with the remaining six symphonies of Piston and five of Hanson to follow. Also scheduled are all of David Diamond's symphonies (he's now completing 10 and 11) and works by Leonard Bernstein, Deems Taylor, Charles Griffes, Paul Creston, William Shuman, and others.

The choice of Hanson to open the series is particularly fitting, given his landmark set of recordings with the Eastman-Rochester Orchestra devoted to the efforts of American composers. (It comes as good news that some of these Mercury LPs are being released on CD by Philips/PhonoGram, which now owns the masters.) Hanson's own music is unabashedly romantic, and these three compositions are emblematic of his style: long, arching melodies, lush harmonies, and heroic brass statements that not infrequently call to mind images of the big screen and casts of thousands. Though Symphony 2 (aptly subtitled "Romantic," composed in 1930) is by far his best-known work, I find 1 (the "Nordic," from 1922) more compelling. But both are cut from the same cloth, and you'll probably find them either uplifting or banal. I must admit that my own reaction vacillates between the two extremes, depending on my mood, though there is no denying this is music that wells with honest, often extraverited, sentiment.

While Piston (1894-1976) and Hanson (1896-1981) were contemporaries, their music is radically different both in inspiration and execution. Each worked within the tonal rubric (Hanson more obviously so), but if Hanson's models were from the 19th century, Piston's were from the 17th and 18th (along with echoes of Hindemith and Bartók). Virtually all the textures Piston creates are contrapuntal—sometimes so relentlessly busy that they become oppressive. Nevertheless, these are masterfully crafted works; while all three are reasonably accessible on a single hearing, greater familiarity should prove worth the effort. Among the more affecting moments are a lovely *Adagio* of mounting intensity in 2, a devilish (both in

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string writing and mood) Scherzo in 6, and finales in each that sizzle (sometimes quite jazzy) with rhythmic intensity. In addition to finely wrought performances brimming with passion and stylistic understanding, the sonics are also splendid—detailed but with enough air to please those (including present company) who cherish clarity of line and timbre as long as it sounds natural. These CDs do.

Schwarz and Delos deserve kudos for celebrating the work of American symphonists—not simply because such work was eclipsed by the onslaught of atonality, serialism, minimalism, aleatorics, and electronics, but because so much of it is wonderful music. On that note, David Diamond's Symphonies 2 and 4 and Concerto for Small Orchestra have just been released. If my recollection of a live performance of the Second many years ago can be trusted, this new recording (the first since its premiere in 1943) promises to constitute the rediscovery of a 20th-century masterpiece. Stay tuned.

—Gordon Emerson

This release, which completes the Takács Quartet's traversal of Haydn's Op. 76 set, comprises especially accomplished playing. All of the typically Haydnesque traits—dramatic harmonic shifts, rhythmic ambiguity, darting humorous motifs, and stark melody—are underscored in execution that goes to the stylistic and emotional heart of these glorious works. The great Largo of 5, the only movement in all of Haydn, so far as I know, to be qualified by the word mesto (sad), is spun out with a sustained intensity that marks it as the antecedent of the extraordinary slow movement in Beethoven's second "Rasoumovsky" quartet. The opening of 4 has a lush intensity that never violates the music's Classical frame, and the crisp articulation in the Minuet of 6 makes clear that it is a forerunner of the Beethoven scherzo. Throughout, the balance among the four instrumentalists is close to ideal (the first violin is at times a bit too prominent), and a few sudden rhythmic adjustments are deployed without damaging line or structure. London's engineering is a bit too resonant, but never blurs detail, and the slightly astringent tone of the Takács suits the music perfectly. I have always been especially fond of the Tátrai Quartet's reading of Op. 76 (superbly transferred to CD by Hungaroton), but these Takács accounts, in their more robust sonority and more liberal use of vibrato, provide a welcome alternative to that distinguished set.

—Mortimer H. Frank

MAHLER: Symphony 6, Kindertotenlieder
Thomas Hampson, baritone (Kindertotenlieder); Leonard Bernstein, Vienna Philharmonic
DG 427 697-2 (2 CDs only). Hans-Peter Schweigmann (Symphony), Karl-August Naegele (Kindertotenlieder), engs.; Hanno Rinke, prod. DDD. TT: 115:18

When Leonard Bernstein climbed the podium before his New York Philharmonic Orchestra to record Mahler's Symphony 6 in 1966, it was a most amazing time for this first great American conductor. The 20th century, truly the American century, was at its height. It seemed that both the nation and the conductor it had spawned could do anything they willed. "Brilliance" was the only term to describe Bernstein's art at this time, the American having inherited the mantle of Western culture from a Europe which, divided and recovering from her war wounds, was taking a step back from the foreground of history.

The project of recording Mahler's symphonies was special for Bernstein. He had a unique identification with the Jewish composer-conductor, and Bernstein's writings as well as performances reinforced a more-than-metaphorical sense that he was Mahler reincarnate. Symphony 6 was yet more special. Alma Mahler, then only recently dead, had considered it her husband's most personal and prophetic work. Expectations would hold that by some associative law of personality transference, Bernstein's New York recording would be transcendent—and so it proved to be, the conductor turning in a slashing, feral account. Many critics have called it too fast; indeed, its first movement is one of the fastest on record. But it defined perfectly the interpreter in his time and place. Brilliant and wilful, perhaps too calculatingly facile, leading to an utterly unsentimental and incon-solable finish, Bernstein's reading flouted death and danced before the decline of Western civilization. The hipster American conductor of unfathomable abilities seemed to have but one fault: that of hubris, or, as the Europeans might say, that he hadnt enough history.

Standing a quarter-century later before a European ensemble, Bernstein records another Sixth. The accomplishment is no less great than in New York; the creative sense is very different.

It would hardly be wrong to attribute the flexible line and broader pace of this new Sixth to Bernstein's long association with Europe, particularly Vienna, and to the general slowing of tempos in his recent conducting. Lord knows I, among other reviewers, have called out these matters in earlier releases of Bernstein's DG Mahler cycle. One need only hear the sentimental swell to the "Alma" theme in the opening movement, or the unselfconscious Viennese lilts that peaks through the Scherzo.
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despite the composer’s 3/8–4/8 distortions, to sense the strong European rootedness.

Such matters alone cannot, however, explain why the tromping heaviness in the opening march theme sounds so right, exploding from the mouths and fingers of players and conductor: weary, joyless, yet soft at heart. By comparison, the New York reading is a bit callow. The softness and sentimentality of the Vienna first movement make the contrast with the chill burlesque of the Scherzo all the more tragic. (I’ve read the theoretical and musicalological arguments for placing the Scherzo after the first movement; Bernstein’s argument is the first I’ve convincingly felt.) Mere attention to European tradition does not explain why Bernstein’s Adagio functions not as an unconnected, pastoral interlude, but continues and deepens the symphony’s tragedy.

Bernstein’s mature, virtuoso conducting voice can explain how he extracts from his players such unanimous transitions from explosive to tremulous sounds, how he can hold together precipitously slow tempos without breaking the symphony’s back. But it cannot alone explain why the creation of his virtuosity, unique among living conductors, is to paint a screwed-up world vividly and compellingly weary.

No, the reason and the differences I hear is history. The Sixth is Mahler’s prophetic work, his annunciation of this violent, godless 20th century. It is the Avatar of Shiva, the Destroyer. A different Bernstein conducts the symphony in Vienna than in New York. He is still the wilful genius of his earlier Mahler performances; to some listeners he will be just as infuriating. But to my ear Bernstein conducting this Vienna 6 is most uncommonly the instrument of forces beyond himself, passing back to this tradition-laden orchestra the essential violence, regret, and self-knowledge of his, and his nation’s, time at the center of Western history, an eternal return closing back on itself.

The Kindertotenlieder course the only fit pairing to Symphony 6. Thomas Hampson sings Mahler’s five meditations on the deaths of children with a flexible, full voice. His account bears few obvious interpretive flourishes, but the sense of grief is more intense because of his circumspection. It is Bernstein and his orchestra who swing a wider arc of color and passion, complementing beautifully Hampson’s interpretation with no damage done to the essential economy of Mahler’s orchestration. Chalk it up, if you will, to my present state of mind—our first child is to be born in three months—but no performance before Hampson’s has evoked in me such feeling for Rückert’s cathartic poetry, nor such understanding of Alma’s rage at her husband for tempting fate by setting these songs.

The DG recording team captures a full and powerful sound from the Great Hall of the Musikverein, not so ravishing as the sound they sometimes get in the Concertgebouw, nor so chaste and clear as what they constructed from Avery Fisher Hall in the Symphony 3 recording. In the present case, their recording suits the interpretation well.

—Kevin Conklin

MARTIN: Mass for two unaccompanied choirs
POULENC: Mass in G, Quatre Petites Prèies de Saint François d’Assise, Salve Regina

Stephen Darlington, Christ Church Cathedral Choir
Nimbus NI 5197 (CD only). DDD. TT: 58:30

This is an important and attractive release. Poulenc’s choral music is well known and recorded (his Gloria alone is represented by a half dozen recordings), but Martin’s remains more esoteric. The two composers were contemporaries; it’s nice to have these works so close together so that we can compare and contrast.

Both major works are a capella masses; both are approachable and have great emotional resonance. Poulenc’s sounds marginally more familiar, more popular, as it were; this may just be due to one’s greater familiarity with him. Or then again, it may be because the “Christe,” for example, sounds, at times, wonderfully like Palestrina. Whatever—the work is profoundly moving, nowhere more so than in its simple “Agnus Dei,” wherein Poulenc stops drawing attention to himself and dazzles us with his pity. The Salve Regina is a spartan work, and the Quatres Petites Prières are handsome miniatures for men’s (low) voices.

Martin’s mass is less contrapuntal but no less interesting. Its highlight is the remarkable “Hosanna,” which follows a mellow, rich, somehow Britten-like “Sanctus.” Startlingly difficult to sing because of its rhythmic quirks, it stays with the listener for a long time. It’s a bit showy, but aren’t “Hosannas” supposed to be?

The 29-voice choir is, of course, women-free, and, as always, flawlessly trained. Stephen Darlington’s leadership is ideal; I doubt this music could sound better. The recording, too, would be hard to beat—the acoustic of Dorchester Abbey in Oxfordshire is properly churchish, while retaining the intimacy these works require. Highly recommended.—Robert Levine

MC LAUGHLIN: Concerto for Guitar & Orchestra, “The Mediterranean”; Duos for Guitar & Piano

John McLaughlin, guitar; Katia Labèque, piano; Michael Tilson Thomas, London Symphony Orchestra


Stereophile, October 1990 237
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When jazz musicians and classical musicians cross over into each other's territory, the results can be dreadful. That's why I viewed jazz guitarist John McLaughlin's Concerto for Guitar and Orchestra, "The Mediterranean," with some apprehension before listening.

I shouldn't have. This concerto is not a masterpiece, but it is very enjoyable—a bright, engaging evocation of the Mediterranean world. If you can imagine a cross between Miles Davis's Sketches of Spain, the original Concierto di Aranjuez, and McLaughlin's Indian-inspired guitar licks, you'd have a fair idea of what this music is like. The fleet-fingered McLaughlin adds his speedy riff-like melodic constructions to an orchestral accompaniment scored by Michael Gibbs. We are left wondering how much of what we are hearing is McLaughlin's composition and how much is Gibbs's orchestration, but the final product is nonetheless cohesive. McLaughlin has so thoroughly absorbed virtuosic speed into his style that it does not draw attention to itself but rather fits with ease into the fabric of the work.

There is also a satisfying sense of form and completeness to the concerto, although McLaughlin could well have reduced the length of the first two movements (11:58 and 15:34). The content doesn't justify the length, but you can sense that there's enough meat there to comfortably fill a smaller outline. At times the music becomes affected, as in the opening trumpet theme of the second movement, but that's a failing characteristic of many compositions by jazz artists: When they try to be pretty they get schmaltz.

Bud Graham did a fine job of balancing the delicate guitar dynamics and tone color against the large orchestra, in so doing creating a wonderfully open perspective that combines inner clarity with a nice sense of hall surroundings.

The Duos for Guitar and Piano are not as impressive as the concerto. Although McLaughlin and Katia Labèque, one half of the acclaimed Labèque Sisters duo-piano team, complement each other well, the works themselves do not bear up to close listening. They're very similar to the acoustic trios McLaughlin performed with his Mahavishnu Orchestra on The Inner Mounting Flame album of 1970-something. The five short pieces make very nice background music, though, and the sound quality is stunning—in the worst sense (i.e., synthetic). Salesmen should find these cuts useful in selling speakers to those more impressed with style than substance. —Robert Hesson

**MOZART: Concert Arias**

Lena Looeens, soprano, Christoph Prégardien, tenor; La Petite Bande, Sigiswald Kuijken

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MOZART, Overture to Le Nozze, works 200 and 204

These nine concert arias were composed by Mozart either for insertion into other people's operas or to be performed on their own, for particular occasions. The earliest, "Va, dal furore portata," for tenor, dates from Mozart's ninth year and needs no apology for the lad's tender age. It's a thoroughly enjoyable, stiffly angry aria in the opera seria tradition of furious exit arias, and while it won't change our lives, it's a fine museum piece. The latest piece we get is the gorgeous, complex, and challenging "Bella mia fiamma," for soprano, composed in 1787. In between are a cute 100-second buffo tenor piece ("Clarice cara") with bass interjections, the well-known, puzzling "Voi avete un cor fedele" for soprano, the epic (14 minutes) scena for tenor "Se al labbro mio non credi," and other gems. The selection can't be faulted, and the little or unknown pieces are welcome additions to the catalog.

Nor do I have any criticism of the sprightly, graceful playing of La Petite Bande under Sigiswald Kuijken. They play period instruments with grace and ease, and the chamber proportions of the group (27 players) is just right for the music. Kuijken minces a bit, however, leading with a slightly too-light hand, particularly for the later works. Furthermore, the engineers seem to agree with him and keep the instrumentalists too far back for my taste. But this is a minor carp.

The disc runs into trouble with the soloists, particularly soprano Lena Looeens. She has the style down pat, reads the texts well, and has all the notes, but she lacks the vocal weight for, say, "Bella mia fiamma," and the sound itself is far from alluring. She's all too often overparted, and the ear gets tired of hearing her almost make it. Tenor Christoph Prégardien is better, but despite his intelligence, sincerity, and musicianship (his light embellishments and quasi-trill are most welcome), his is not a voice one wants to live with. Both singers are, in a word, lightweights, so what can I say? This is for specialists: Frankly, I like it and have found myself returning to it often, but it can't be recommended without a warning. We get only one side of Mozart here, and it's impossible not to feel a bit shortchanged. —Robert Levine

**MUSIC OF DAVID SHIFF: Divertimento from Gimpel the Fool, Suite from Sacred Service, Scenes from Adolescence**

David Shifrin, clarinet; members of Chamber Music Northwest

Delos DE 3058 (CD only). John Eagie, Laura Wirthin, Andrew Dawson, engs.; Amelia S. Haygood, exec. prod. DDD. TT: 61:46

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According to composer David Shiff, the notion of "basing classical music on non-classical" sources has intrigued him since his student days. This Delos CD contains three very different manifestations of that notion. All are eloquently performed by members of Chamber Music Northwest, an Oregon-based group similar in format to the Chamber Music Society of Lincoln Center.

Though such vogueus terms as "crossover" and "fusion" are often used to describe Shiff's compositions, they are arguably no less "classical" than many by the likes of Sibelius, Smetana, Dvorák, or Ives. That is, while non-classical elements are drawn upon (sometimes heavily in Shiff's case), they are then transformed considerably according to the composer's imagination and sense of style and form.

Both Suite and Divertimento—whose origins have been in earlier, larger works—are deeply informed by Shiff's Jewish heritage. The Divertimento is a four-movement adaptation for clarinet, violin, cello, and piano of material from his opera Gimpel the Fool (based on Isaac Bashevis Singer's tale of the same name). The music resonates with undertones of the klezmer band as well as echoes of the free, often florid haszazanut melodies intoned for various Jewish liturgical rites. Shiff has forged these elements into a kind of instrumental cabaret entertainment overflowing with authentic atmosphere and charm. While many listeners will surely share my enjoyment, those Jews intimately familiar with their musical and cultural roots will undoubtedly find added delights and emotional connections in this music.

Shiff's complete Sacred Service was conceived for woman cantor and professional choir; this extract is comprised of four prayers from the original plus a new one—Shalom Rav—written for a subsequent concert dedicated to nuclear disarmament. The cantorial part is realized by soprano Judith Blanc Shiff, whose otherwise sympathetic interpretation is marred by an overactive vibrato. In common with the Divertimento, the Suite's musical language is steeped in a feeling of Jewish melos, here with an emphasis on its lyrical side. The result is an appealing amalgam of traditional sounds cast in a conservatively modern setting.

The non-classical sources in Scenes from Adolescence, says Shiff, include hard bop and, to a lesser extent, Motown rock. Though he didn't mention down-home blues, it's also part of the mix in which he attempts to synthesize—successfully—such elements with sounds more akin to Stravinsky and Bartók. The music is often breathlessly motoric, presenting flutist James Walker, clarinetist David Shifrin, violinist Ik-Hwan Bae, cellist Warren Lash, and pianist Victor Steinhardt with dauntingly virtuosic challenges. Rather than forming an obstacle, however, these challenges only serve to inspire playing that crackles with intensity and emotional commitment.

Each work was recorded in a different venue by different engineers using the same equipment (details of which are listed in the program notes). Since I have no idea what live music sounds like in any of these settings, I can't report on how accurately Delos has captured their acoustic personalities. But on its own terms as a recording, the sound quality of this CD is excellent in every respect, Scenes from Adolescence deserving particularly high marks on the illusion-of-reality scale.

—Gordon Emerson

SORABJI: Opus Clavicembalisticum

John Ogdon, piano

Kaikhosru Shapurji Sorabji, an Englishman born as Leon Dudley in 1892 of a Parsi father and a mother of Spanish-Sicilian extraction, died in 1988 but had already been for years considered a cult figure, albeit a highly eccentric one, among the cognoscenti. The select few who knew his music admired the composer's vast intellectual prowess, the scope of his highly complex musical canvasses, and, one supposes, even supported his unwillingness, after a traumatic 1936 experience of hearing his music poorly played, to have his works performed at all. It was not until the mid-'70s that Sorabji finally acquiesced, lifting the ban and allowing the American pianist Michael Habermann the privilege of playing his music, the first recorded outcome of which was a 1980 Musical Heritage anthology (MHS 4271), one of eventually three such albums. Since then other pianists have taken up the Sorabji mantle in public, including Geoffrey Douglas Madge, Yonti Solomon, and the late John Ogdon.

The present work, a gargantuan, 4½-hour piano solo that was first performed by its composer in 1930, the year of its completion, was in fact played privately by Ogdon as long ago as 1959 in England, and his recent recording in 1988 is the first complete one on CDs. Modelled in part after Busoni's Fantasia Contrappuntistica, the 252-page score consists of three enormous sections subdivided as follows: Pars Prima: I. Introito, II. Preludio Corale, III. Fuga I, IV. Fantasia, V. Fuga a due soggetti // Pars Altera: VI. Interludium Primum (Theme cum XLIX Variationibus), VII. Cadenza I, VIII. Fuga a tre soggetti // Pars Tertia: IX. Interludium Alterum (Toccata, Adagio, Passacaglia cum LXXX Variationibus), X. Cadenza II, Fuga a quattro

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soggetti, XII Coda Stretta.

How does one describe such music, aside from stating one's personal wonder at the immensity of the architeconic concept, of fugues with one, two, three, and four subjects, of inclusions that contain themes with, variously, 49 and 81 variations, of cadenzas of extreme virtuosity that straddle the entire length of the keyboard? The music is of incredible polyphonic and polyrhythmic complexity, and is primarily atonal; it is violent, stark, grand, emotional, introverted, frightening, haunting, severe, rhapsodic, expressionistic, impressionistic, demoniac; it contains fistful of notes; it is mystical, Busonian, Ivesian, partly Bergian, and redolent of Messiaen. It is surely an outsized intellectual curiosity (Ogdon, in one of several essays contained in the accompanying 62-page explanatory book, likens Sorabji to Melville and this austere work to Moby Dick). Opus Clavicembalisticum may also prove quite a trial for the listener unwilling to spend the time with both music and at least rudimentary analysis. Is it worth the effort? That depends on one's patience and one's eagerness to be intrigued by one of the most unusual works of 20th-century piano repertoire, for the music heard superficially can just as readily give the impression of empty, bombastic clutter.

Ogdon's formidable contribution (is this his very last recording?) is staggering to the ear, but so is Michael Habermann's performance of just the two opening sections of the work on MHS. Perhaps Ogdon has the more demonic as well as spiritually mystical touch, an interpretive, yet acoustic characteristic surely caused by the drier ambience heard in the Habermann miking. Ogdon's Bösendorfer is somewhat distantly miked, a bit hard-toned, and not very mellow; it is not an outstanding piano sound, but is otherwise adequate. In spite of the impressively exhaustive book that accompanies Altarus's four-CD album, there are some production details that have been omitted: nowhere is there any attempt, other than on the disc labels themselves, to indicate how the work is divided between the sides, and, furthermore, there ought to have been more tracks (and even index points) than just for the major subdivisions. Overall, Habermann's varied offering on LP is, I believe, the more inviting introduction to Sorabji, but the truly adventurous listener (with an abundance of time at his disposal) will certainly want to own Ogdon's gigantic achievement.

—Igor Kipnis

R. STRAUSS: Schlagobers
Hiroshi Wagaosegi, Tokyo Metropolitan Symphony Orchestra
Denon CO-73414 (CD only). Yoshiharu Kawaguchi, recording director; Norio Okada, eng. DDD. TT: 74:45

Sentimentality without true sentiment is kitsch. Hannah Arendt might call it proto-fascism. Like Salvador Dalí's, Richard Strauss's talent more often than not stopped at his elbow. Strauss in a particularly uninspired mood raised kitsch to a terrifying apothecary of emptiness—like the pretty floral paths leading to Auschwitz's gas chambers.

Before the Straussians string me up, they should know that two of the few non-Wagner opera recordings I own—and love—are Salome and Elektra. I find Richard Strauss's early tone-poems to be marvels of energy and orchestration, if not profundity, and Zarathustra's hot-house counterpoint is a delight. Not to mention Metamorphosen and the Four Last Songs.

In Salome and Elektra, those orgies of appetite and revenge, Strauss seemed to have the conviction of at least his own heartlessness, decadence, depravity, and despair. But already with Der Rosenkaavalier, the Op. 59 to Elektra's Op. 58, Strauss had begun his long, slow slide into the sort of cheap nostalgia, treacle, and beery sentimentality that the Nazis were to find so comforting. (A friend of mine once told me that Rosenkaavalier is the only opera by anyone that leaves him feeling as gemütlich as does Wagner's Die Meistersinger. I was speechless—to me, the former has always sounded like the latter's hellish parody, a heartless autocrat's cynical—or pathetic—attempt to merely impersonate fellow feeling and honest emotion.)

Schlagobers (literally, "whipped cream on top"), Strauss's Opus 70, a 1922 ballet about sugar products, is the nadir of this downward slide. Schlag surpasses Sinfonia Domestica, Don Quixote, even the Alpenfsonie as prime exemplar of the horror of the composer's appalling virtuosity when in the service of nothing at all! One newly understands Webern and Schönberg as the punks of their generation, deflating such post-romantic windbag facsists as Richard Strauss. What breaths of fresh air they must have been.

Horenstein called him "a man of office." Richard Strauss was not so much a composer as a compulsive aural narrator, once admitting that he found it next to impossible to compose without a "story" of some sort—any sort, evidently—to guide his hand. (One need but hear any of the purely "musical" compositions from very early or very late in his career to know how true this was. Strauss himself called them "finger exercises." He was too kind.) The story

[1] Having sat through Schlagobers while editing RL's review, I am tempted to say that if Rosenkaavalier was Richard Strauss's attempt to prove that he could write waltzes as popular as anything the father-and-son Johann Strauss, this piece of over-cooked balletic confectionery is Strauss trying—and failing—to cut Tchaikovsky.
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—Strauss's own—from which Schlag hangs is a molecule-thin confection (literally) about a group of young children visiting a Viennese Konditorei (pastry shop) and gorging themselves sick while being visited by visions of sugarplums. Characters like Prince Coffee and Prince Cocoa reign over such numbers as "Whipped Cream Waltz," "Cocoa Dance," and "Dance of the Tea Flowers." Act II takes place in a hospital ward, where one of the children is recovering from sucrose toxicity. He's not at all cured by such titles as "Jump Dance of the Crackers," "Dance of the Little Pralines," and the topper, "Ring Dance of Pacification by Black Beer." Bring on the insulin. His condition quickly deteriorates into delirium, a perfect opportunity for all sorts of unrelated tableaux.

Scored for full symphony orchestra, Schlagobers abounds in Strauss's trademark over-divided strings, percussion writing for brass, relentless chromaticism that would seem parodic if it weren't laid on so thick, and endless, fragmented waltzes long overdue for the compost heap (exactly the sort of fin de siècle Nef-fiddling parodied so nastily in Mahler's later Ländler). The work is intrinsically woven of scores of themelots and leitmotives, all indexed on the CD and carefully noted in the exhaustive but humorless booklet's three languages. But Strauss is working with building materials so shoddy they fall apart in his (and conductor Wakisugi's) hands. The overall effect is of a full-scale replica of the Taj Mahal made entirely of chicken fat, less composition than decomposition.

I first heard the ballet 25 years ago on New York's WQXR-FM, in the only other recording ever made—Erich Kloss on the phantom Lyric chord 741E, long out of print but still mysteriously listed in Schuermann like something out of Pynchon—and sort of liked it. I was a forgivable 15, and wondered why such an ostensibly "major" work had gone so unrecorded. When Denon's Wakisugi recording arrived, I was intrigued. But as Schlagobers's 75 minutes wore on, I began to wonder why Strauss hadn't found something more important to do—like clean the bathroom. The thought of the poor soulless man, slogging on with this monstrosity, somehow knowing (he bad to have known) that this was the best he could do, was scary. This is the most desperately unnecessary note-mongering I've ever heard—"light" music so heavy, so determinedly cute, it sits in the gut like a 70-year-old, five-pound chocolate Easter egg.

Hiroshi Wakisugi is cautious and plodding, rhythmically literal, his goose saved only by a few lyrical soloists. He treats the music as if it were actually valuable—a grave mistake. Schlagobers needs someone like Neeme Järvi, who has built a career on first-rate performances of second- and third-rate repertoire. Splashy, bloated, meaningless writing like this does not need to be reverently intoned from atop Lenin's tomb like the latest Party revision of Comrade Lenin. Actually, one needs to be drunk—and I don't mean as in Act II's "Rivalry in Love of Three Types of Liqueur" I do mean as in Charles Dutoit's hony, totally sloshed carouse through Ravel's La Valse (London 414 406).

The sound is flat, the Tokyo MSO sounds flimsy, gossamer, and sodden all at once—not a bad trick. But perhaps that's how they sound. Maybe that's how Saitama's Toda Public Hall sounds. It sure isn't how my Vandersteen 2C1's sound.

Schlagobers must be heard to be believed, but only once. It's of less historical than spiritual interest, valuable as a record of the voids into which a bankrupted human spirit can disappear, and of the fact that no man is so worthless that he cannot serve as a horrible example.

—Richard Lehnhert

R. STRAUSS: Symphonie Domestica, Death and Transfiguration
Fritz Reiner, Chicago Symphony (Symphonia), RCA Victor Orchestra (Death)
RCA 88-2-RG (CD only). Lewis Layton, eng.; Richard Mohr, prod. ADD. TT: 66:29

Recorded in November 1956, Symphonie Domestica was one of RCA's earliest applications of three-channel 1/2" tape mastering. When the mono was released a year later, stereo LPs lay still another year in the future. A 1957 color catalog for RCA's consumer half-track stereo tapes bears an illustration as well as a numerical designation (FCS-44) for Symphonia. Although several friends and I managed to collect a number of these tapes at close-out sales, I never saw a copy of this tape, nor do I know anyone who has. Though critically acclaimed, the LP was destined to become an early cut-out, not to be released in stereo until the advent of the budget Victrola line in 1966.

The Victrola edition, particularly in its original plum label stamper incarnation, is disqualified as a candidate for all-out audiophile super disc status due to stamper noise in the quiet passages of side 1 and some rather officious and unnecessary gain riding on side 2. I've heard of a legendary Japanese edition of this recording, reports of whose mythical qualities I'm quite prepared to believe, based on a handful of Japanese RCA recordings I've managed to acquire. These were audiophile-grade vinyls of near-Chesky quality in the Japanese Victrola line of the late '70s/early '80s. Shortcomings notwithstanding, the US edition still remains a genuine vinyl collectors' item, and

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a sturdy frame of reference for this CD.

At first, the spectral balance seems a bit dark in comparison to the Victrola Plumb, but as listened to through a brand-new California Audio Labs Tercet Mk.III, the disc edge treated with a dab of CD Stoplight, the CD appears to have lucid timbral character, clarity of texture, and the distinctive Orchestra Hall sound. And there's enough left over for some tape hiss, just to reassure us that the recording hasn't been excessively de-noised.

In addition, one must thank RCA for getting the mid-phase side break right. If you're familiar with the original vinyl, you'll know where to listen for the join-up, which is precisely where it should be, and as it could only have been executed by one familiar with the work, or referring to a score. And there's no gain riding, just full dynamics and a sound so clear you may even suspect you're hearing construction noises from the building next door to Orchestra Hall.

Critics have been fond of trashing this uneven, problematic work as an overinflated portrayal of the composer's family life. I find it more endearing than repellent, but it requires performers who can reconcile the humorous with the tender without burlesque or cloying, and to render the piece with virtuosity without merely turning it into a concerto for orchestra. You may debate the merits of the piece, but this still remains one of Reiner/CSO's "Greatest Hits."

Rarely recorded at all, the Reiner/CSO Symphonía was the first in stereo. Collectors with a historical perspective will want to hear the Furtwängler/Berlin live performance of 1942, recently reissued by DG, as well as a 1953 live performance by Clemens Krauss/Bavarian Radio on Orfeo. The closest modern rival is Neeme Järvi/Scottish National on Chandos. Despite the audible evidence of editing, Reiner/CSO manages to sound as much like a unified single performance as the two above-mentioned live ones. Moreover, the CSO gives it an heroic, ballys, go-for-it approach which has become all too rare in today's recordings.

For many collectors, the big surprise on this CD will be the 1950 mono recording of Death and Transfiguration, in which Reiner manages to draw from an all-star team comprised of his favorite players from the NBC, NYPO, and the Met, a performance which remains, to this day, one of the greatest DGs ever committed to recording, more involving by far than his 1956 recording with the Vienna Philharmonic (currently unavailable but likely to be reissued as a Decca/London budget).

DG has been equalized without apologies to the authenticity of 1950 tape. The production is somewhat dated in its close studio-like detail, which falls somewhere between the very close-up sound of Toscanini and the lush, larger-than-life sound favored by Stokowski. The clarity is sufficient to reveal not only the most intimate details of nuance, but of the suspicious sound of a door being shut during the introduction.

Rehearing these performances reminds us yet again that recordings which sound and feel like performances are a nearly lost art in today's industrial milieu of mindless editorial perfection. A&Rs and technicians, as well as performers, need to hear recordings like these and ask what can be done to get back to this type of square one.

—Richard Schneider

VERDI: Requiem
Sharon Sweet, soprano; Florence Quivar, mezzo-soprano; Vinson Cole, tenor; Simon Estes, bass; Berlin Philharmonic Orchestra, Ernst-Senff-Chor. Carlo Maria Giulini
DG 423 674-2 (2 CDs only). Ulrich Vette, eng.; Werner Mayer, prod. DDD. TT: 97:02

Hans von Bülow—the German conductor whose extra-musical claim to posterity is that although cucked by Richard Wagner he remained the composer's faithless disciple—in an exercise of utter ignorance, dismissed Verdi's Requiem as "Verdi's latest opera, in ecclesiastical dress." This derisive arrogance backfired and is still quoted in a highly positive sense by the work's many admirers. When Johannes Brahms heard Bülow's aspersion, he declared, "Bülow has made a fool of himself. This is a work of genius."

Unlike many other composers' liturgical compositions, Verdi's Requiem was not created for religious services. Written as a concert piece, it was intended to lift listeners to their feet in excitement rather than lower them to their knees in pious supplication. Unlike Brahms' own beautiful, but somberly serious, realization of the Requiem, Verdi, drawing on his vast experience of shaping emotions by theatrical (perhaps "dramatical" is considered less pejorative to Bülow sympathizers) composition, wanted his Requiem to invigorate and arouse, rather than pacify with piety. Giulini, it appears from this latest recording, now thinks otherwise.

As a long-time admirer of the Italian maestro, I have been aware that for the last decade or so his interpretive creed seems to have undergone something akin to a metamorphosis. Never a Sturm und Drang director or so-called literalist in the Toscanini mold, his interpretive signature usually guaranteed a sensuous amalgam of the cerebral with the visceral. This stimulating formula—diluted somewhat by a too-reverent atmospheric approach—distinguished his superb EMI Requiem recording of

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1964. As the work cries out for the wide dynamics of digital engineering, his legions of admirers, including this one, have long awaited this CD account. Unfortunately, it fails to fulfill expectations. For whatever reason, his current overview lacks the pulse and dynamism of the earlier recording. It is unduly expansive (to soporific dimensions in several places), presumably due to Giulini's latest hyper-spiritual conception. His overdone celestial vision almost vitiates the piece's inherent drama. The requisite sense of urgency and the blazing anguish of those great choral contributions are diluted in the context of this austere, injudiciously pious performance.

However, any Giulini performance offers rewarding musical felicities—and this is no exception. Inner orchestral voices frequently smothered by other conductors are highlighted yet stop short of being obtrusive. Both the orchestral and choral contributions benefit from Giulini's talent for contouring seamless legato lines: both make beautiful music. If the drama, the sheer emotional impact and vitality that Verdi created, is presented in subdued, staid doses, the too-secular vision that Giulini now espouses is, at least, soothing.

The conductor, of course, is particularly sympathetic to singing and singers (not all famous maestri are), and he integrates the four soloists with accustomed skill and efficacy. Unfortunately, bass-baritone Simon Estes, whose gluttonous, distorted vowels defile the glorious "Confutatis" and damage his important concerted passages, lets the quartet down with tedious, undiomatic singing. Both Florence Quivar and Vincent Cole make positive contributions though neither possesses the desired vocal opulence.

Sharon Sweet, another of the several large, young American sopranos with large, beautiful voices to appear within the past couple of years, is obviously an artist to watch out for. She is totally right for this work (unlike her predecessor of the 1964 recording, who just happened to be married to the producer). Her rich, round-toned, lovely voice is used with grace and distinction. The rigors of the "Libera me," and the celestial conclusion necessitating near-perfect vocal control, obviously hold few terrrors for this young lady. She almost succeeds in inspiring Giulini to the fitting sense of urgency. The recording of the solo quartet is a little distant, but, unlike some other recordings, the individual members are quite audible. In fact, the engineering in toto is commendable, if not as impressive as Telarc's release featuring Robert Shaw and the Atlanta Symphony. Musically, too, I prefer the Telarc to this release. Giulini's current ideas on the *Requiem* seldom provide for the anticipated heights of exultation that many scholars believe Verdi (a reputedagnostic and certainly not a church-goer) envisioned.

—Bernard Soll

**VERDI: Rigoletto**

Giorgio Zancanaro, Rigoletto; Daniela Dessi, Gilda; Vincent La Scala, Duke of Mantua; Paola Burchuladze, Sparafucile; Martha Senn, Maddalena; others; Orchestra & Chorus of La Scala, Milan, Riccardo Muti

EMI CDs 7 49605 2 (2 CDs only). David Groves, prod.; Michael Sheeay, eng. DDD. TT: 115:51

**VERDI: Rigoletto**

Leo Nucci, Rigoletto; June Anderson, Gilda; Luciano Pavarotti, Duke of Mantua; Nicolai Ghiaurov, Sparafucile; Shirley Verrett, Maddalena; others; Orchestra & Chorus of the Teatro Communale, Bologna, Riccardo Chailly

London 425 864-2 (2 CDs only). Christopher Raeburn, prod.; James Lock, Andrew Groves, John Pellione, engs. DDD. TT: 113:14

By my count, which may be off by a couple, these are the 13th and 14th complete *Rigoletti* now available on discs. Considering shelf space and consumers' budgets, they better offer something special. And each sort of does, but certainly not enough to displace anyone's long-standing favorite.

First to overviews: Muti's performance uses the new, critical edition of the score and, as usual, anything not written by the composer does not pass the lips of his singers. Chailly's is a typical modernized Romantic performance, which is to say that optional high notes and other non-sinful liberties are taken, and aside from a couple of bars, the music is all here. (The only music I really missed was the beautiful cadenza to the Gilda/Duke duet which Muti gives us, as does Solti on RCA, with Moffo and Kraus.) Muti is obviously searching for a small-scaled, young-sounding reading by his choice of soprano and tenor; Chailly packs lots of heat. Both conductors apparently want to get the whole deal over with as quickly as possible. Muti's crimes here are truly awful; indeed, both the opera's first scene and the "Si vendetta" duet which closes the second act are taken so fast that they made me laugh—hardly the appropriate reaction. (It takes 1:57 on Muti, 2:17 on Chailly—a startling difference.) Chailly, though also too rushed, is, in general, more sympathetic to the opera's drama, lingering over the father-daughter music in the opera's second and third acts so that we are genuinely moved by them. Muti, on the other hand, does not give either singer enough space to get involved, and the opera suffers. The music sounds fine—crisp and clear—but the reading is detached. Nuf said.

In the smaller roles, neither Maddalena is good, with Shirley Verrett, in particular, sounding as if a hole has been dug in the middle of
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her voice. Paata Burchuladze gives the impression of reining in wild horses at Sparafucile's most conspiratorially quiet, while Ghiaurov is in excellent form. Both Monterones give the aural equivalent of foaming at the mouth, and all the other supporting players are good.

In the title role, for Muti we have Giorgio Zancanaro's genuine Verdi sound—lush and luxurious. Sadly, he's so rushed that he can't get into Rigoletto's skin, and sounds angry and nasty even when he's supposed to be sympathetic and supplicating. A pity, since his voice is the real thing. Leo Nucci does not have a great voice in the classic Tibbett/Warren/Bastianini sense of the word, but he has the Verdi style down pat and reads the text so well that the fact that his sound is the wrong weight stops mattering. But it's disturbing to hear his cry of "Ah, la maldecizione" at the close of Act I—it moves from sharp to flat within a second or two. (Quite a feat, and a lesson to young singers who tend to push their voices.) But overall, his reading is successful. Daniela Dessì is not world-class as Gilda, and after a while she starts to annoy. June Anderson is fabulous vocally—"the last time this music sounded so secure was from Sutherland. Comparisons with the great Australian don't stop there, by the way—Anderson's consonants are wrapped in hunting half the time, and she's less than totally involved. But let's not complain. Her singing is Golden Age bel canto. Vincent La Scala's Duke is very well sung, but he sounds as seductive and/or menacing as a fox terrier. Pavarotti is even better than he was 17 years ago for Bonyne on London. His Duke is a full-drawn lecher with great appeal and a dangerous type of class. And the notes are still there, by the way, although I wish he had left the high D—torn from his throat at the close of "Possente amor"—somewhere else. (I'd like a dollar for every take they needed to find one worth splicing in.) In all, he's splendid.

It's pretty clear: the Muti is for scholars and speed freaks, though it's easy to see what he was driving at. He just doesn't make it—perhaps more assertive singers could have made the performance come to life (although he clearly wasn't looking for alternate opinions). Chailly's is a beautiful reading, though he and most of his cast lack that extra something which makes one really feel the tragedy of Rigoletto. The voices in the Chailly are more prominent than in the Muti, but both recordings are clear, vivid, and very bright. Booklets with good essays, translations, etc. A clear choice here, but hold on to Solti/Moffo/Merrill/Kraus and Serafin/Callas/Gobbi/de Stefano for dear life. In the real world, those are still the real thing.

—Robert Levine

Classical Collections

HOROWITZ: The Recordings, 1930–1951

Vladimir Horowitz, piano; Albert Coates, London Symphony Orchestra (in Rachmaninoff Concerto) Angel/EMI CDCDC 63538 (3 CDs only). Keith Hardwick, digital remastering. ADD. TT: 2:59:49

HOROWITZ ENCORES

These anthologies are essential acquisitions for the Horowitz enthusiast. The EMI compilation represents almost all of his early recorded output for the British firm, a collection of some of his most important recordings such as the astounding 1930 Rachmaninoff Concerto 3, the electrifying Liszt Sonata of 1932, and breathtakingly sensitive and characterful Schumann and Chopin, among a host of brilliant performances too numerous to mention. This is also the period of the simpler, less affected Horowitz. One previously unreleased 78 side, a Prokofiev Toccata from 1930, is included, but a few editorial glitches in the accompanying booklet are also present: the Schumann "Presto passionato" specs are missing (OB–450%; DA–1301, recorded Nov.15, 1932), and the Chopin Impromptu 1 and Nocturne, Op.72 No.1, date from 1951, not 1935.

BMG's selection derives from RCA Victor recordings of 1942–1980, mostly studio-made but also including several items taken from live recitals, so characteristic of the encore portions of the late pianist's programs; here will be found both such hair-raising crowd pleasers as his "Carmen Variations" (his second recording, of 1947), Moszkowski's "Étincelles," and
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of irrational strand masses
in an exponential progression.
the incomparable "Stars and Stripes Forever," as well as such examples of the fabled singing tone as Schumann's "Träumerei" and Mendelssohn's "Spring Song" (but why wasn't "May Breezes," the fourth of the pianist's Songs Without Words recordings, included?).

The BMG encore collection is, understandably, variable, sometimes a little shy on bass with perhaps more top cut in the 78-derived material than some listeners (such as I) would prefer. In comparison, however, to the travesty of the EMI set, it comes off extremely well. The problem with the latter lies, firstly, with the producer's efforts at removing 78rpm surface noise: too many record firms not only find it objectionable but consider that potential customers would wish to shy away from purchasing a disc of historical importance when that surface remains too much a part of the sound picture. Of the various attempts at removing this kind of noise, a top cut (among other things) may quite destroy a pianist's tone, not to mention changing the original ambience. What EMI has done, however, is to utilize a frequency-limited dynamic-range compressor which bears the name Cedar.4 It does not appear to have been used consistently, and its effect as heard here is variable; at its glaring worst, as in the 1951 Scarlatti and Chopin, one hears an obvious pumping, the loudest sections having more prominent highs, the softer ones being methodically attenuated. The result, even in the earlier "Funerailles" of 1932, is especially noticeable when there are sudden fluctuations of piano volume, with the music giving the impression of getting artificially louder and brighter every time there is a rise in volume. Since my library contains almost all of the original Horowitz 78s, I was able to make a comparison with a number of these vs EMI's CD "reconstitution," and, without exception, I was able with the original discs to obtain greater depth and transparency as well as very much more vivid and colorful, less boxy and constricted reproduction. It's really too bad that the CD consumer must face such a misguided effort or do without.

—Igor Kipnis

VARIOUS: Elizabethan Ballads and Theater Music
The Musicians of Swanne Alley; Lyle Nordstrom, Paul O'Dette, directors
Virgin Classics VC 7 90789-2 (CD only), Martin Compton, prod.; Anthony Howell, eng. DDD. TT: 65:47

This CD is the latest (so far as I know) of a type of recording that has been consistently popular with Renaissance consorts—the "popular music" disc. Fortunately for even the jaded listener, there is always room for another such collection, especially if it is as well done as the present example. The Musicians of Swanne Alley have been together some 14 years now, and their ensemble playing is as good as one could wish. All of the musicians involved play more than one instrument, and this lends welcome variety to what is, I must admit, a selection of works not remarkable for its novelty on recordings.

In addition to their ensemble skills, every-

fine touch, crisp but sonorous, and even when this repertoire calls for percussive attack, she never produces an ugly sound. She gives a fantastically well-constructed program too, comprised of large-scale works by Elliott Carter and John Adams, that illustrate entirely different compositional concepts, framed by six miniature tangos, which again show the variety of techniques that the 20th-century composer has within his grasp.

Nancarrow's "Tango?" rightly questions the efficacy of that title, for here only the rhythmic skeleton of the dance can be glimpsed. The delicate, single-note texture gradually expands with a wide-ranging frenzy that lends the piece a certain wit. By direct contrast, Bolcom's piece sports a more traditional approach, and Michael Sahil's "Tango from the Exiles Café" throws up all the sleazy, rather familiar passions of the dance form. Hemphill and Jaggard adopt an abstract stance; Lukas Foss imaginatively arranges an accordion piece. All these tangos, selected from the International Tango Collection commissioned by pianist Yvar Mikhashoff in 1983, are performed with great lucidity.

Carter's Night Fantasies are haunted by the myriad thoughts that dart in and out of one's mind during a period of insomnia. Thus the piece is one of rapid mood change, of short ideas that disappear almost as soon as they arrive, of others that blossom into something quite substantial. Adams's Phrygian Gates, by contrast, is an atmospheric piece of mesmeric harmonic repetition in the Lydian and Phrygian modes, moments of change signifying the arrival at a "gate." Quite how virtuosic Oppens is in handling the huge diversity of styles on this disc cannot be adequately described—go out and buy! —Barbara Jahn

Ursula Oppens: American Piano Music of Our Times
Ursula Oppens, piano

This is a wonderful disc. Ursula Oppens has a

2 For a more positive view of the Cedar process, see Ken Kessler's report in last month's "Industry Update." —JA

Stereophile, October 1990 253
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one here gets to display their talent in a lead or solo role. David Douglas, whom you will remember from the Newberry Consort, does some fine fiddling on "Chii passa per sta strada," and the two directors solo and duet on lute, pandora (said to be a distant ancestor of the banjo), and cittern. Soprano Emily Van Evera handles all of the vocal chores adeptly (although her stage Cockney on "Packington's Pound" is regrettable), even if she does not quite match Simpson, Baird, or Kirkby. (Compare, for example, "O Death Rock Me Asleep," where Van Evera has not quite got the phrasing right: Baird has it heartbreakingly perfect.)

The real joys here are instrumental, a spirited "Waltkins Ale" and some lively viol playing on "Guililum's Dump," along with a great deal more. My personal favorite is the splendid rendition of a set of consort variations on "Green-sleeves," which the notes attribute to John Johnson (ca 1540–1594). This may well be the best-sounding Virgin I have yet experienced. Timbre is wonderfully true, especially considering all those Ds, and soundstaging is as good as digital gets. To give the most telling example: on the recorder consort piece "Browning my dear" (not, I trust, by E.B.B.), someone—probably Paul O'Dette, who is not listed as playing recorder—is off in the back left corner of the hall playing what sounds like a pair of spoons. Not only does he image way back there, the reflections from the side wall clearly come from outside the left speaker. Yet another nifty demonstration for the unbelieving masses.3

—Les Berkley

Show Music

AN EVENING WITH JERRY HERMAN: Original New York Cast
Music & lyrics by Jerry Herman
Arabesque Y2001 (CD only). Ward Botsford, prod.; Frank D. Laico, eng. DDD. TT: 59:57

The concept is simple: excerpts from Jerry Herman's shows (Milk and Honey, Hello, Dolly!, Mame, The Grand Tour, Mack and Mabel, Dear World, and La Cage Aux Folles) are presented in the "And then I wrote..." style, Herman playing the piano, and featuring Broadway veterans Karen Morrow and Lee Roy Reams. What makes the recording special is the sense of sheer enjoyment communicated by the performers. The just love doing this and don't care who knows it. Karen Morrow has the most difficult job, singing songs made famous by some of Broadway's greatest stars. Without being mannered or idiosyncratic, she makes songs originally sung by Bernadette Peters, Angela Lansbury, Carol Channing, and Ethel Merman sound as if they're her songs. She is matched by Lee Roy Reams, who brings his own distinctive style and strong vocal presence to the proceedings. Jerry Herman does the narration in a self-effacing manner,4 plays the piano well, and the singing he does, while no match for his colleagues, is better than one might expect from one whose trade is writing songs rather than singing them. Bassist Bill Ellinson provides unobtrusive support throughout. Recorded before a studio audience, there is a convincingly "live" quality to both sound and atmosphere, even including a false start to one of the trio numbers: Herman comes in too early during the vamp, stops and apologizes, there is a bit of banter, then they re-start. Producer Ward Botsford chose to leave it in, a decision that might lose points on technical grounds but is brilliant in theatrical terms.

All the expertise in performance would be to no avail if the songs did not deliver the musical/lyrical goods. Jerry Herman may not have the seriousness (some would say, pretentiousness) of approach to musical theater that characterizes Stephen Sondheim, but he has demonstrated a knack for writing tunes of the "take home" variety. Stripped of overblown orchestrations/arrangements, as they are here, the songs often work better than in the original cast versions. One number that simply knocked me out was "I Don't Want to Know," from Dear World. Angela Lansbury's original cast performance, Tony winner or not, has always left me cold; Morrow and Reams not only sing better, they're more convincing at creating a mood of Jacques Brel-ish desperation. Highly recommended.

—Robert Deutsch

MAGDALENA: 1989 Studio Cast
Music & orchestrations by Heitor Villa-Lobos. Lyrics & adaptation by Robert Wright, George Forrest

Although Wright and Forrest have written original music for some of their shows (eg, Grand Hotel, currently on Broadway), their main claim to fame is as adaptors of the works of "serious" composers such as Grieg (Song of Norway) and Borodin (Kismet). Magdalea does not quite fit the pattern, in that the music is neither their own, nor is it the adaptation of the work of a long-dead composer: Villa-Lobos was not only alive but an enthusiastic collaborator in the creation of his own music. But in the hands of Wright and Forrest, the results are anything but disappointing, even to an audience that might, at first, be put off by the music's lack of modernity.

3 Someone is probably going to accuse me of deliberately not mentioning the one sonic flaw on this disc. Yes, Van Evera's voice is distorted at one point on track 8.

4 I do wish they had set up the narrative sections as separate tracks, so that one could program playback that omits them. How Jerry Herman got his start in the theater is interesting, but it definitely palls with repeated hearing.

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rator in the project. As Wright and Forrest tell the story in the liner notes to the recording, *Magdalena* had a triumphant 1948 Los Angeles première, a San Francisco run that had critics outdoing themselves in superlatives about the score, and, apart from "book carps in a couple of corners," warmly enthusiastic reviews in New York. Wright and Forrest suggest that only the absence of a cast album kept *Magdalena* from the long run it deserved. Whatever the case, *Magdalena* has not had a significant revival until the 1987 concert performance that is the basis of the present recording.

So much for history. Heard with 1990 ears, how does *Magdalena* stack up? Is it, as Wright and Forrest claim Richard Rodgers said in 1965, a work that was "still 25 years ahead of its time?" Perhaps. In musical terms, it's certainly not at all like *Song of Norway*, *Kismet*, or *The Great Waltz*, and anyone expecting a lifting old-fashioned opera is bound to be disappointed. There are a lot of Brazilian folk-song-inspired melodies, many in a highly rhythmic idiom (percussionist Patrick Smith gets a good workout), some quasi-operatic sections, a few bits that sound like they could have been written by Offenbach or G&S. There's one number that pays convincingly nostalgic tribute to Cole Porter's favorite city ("Bon Soir, Paris"), and a player-piano tune ("Broken Planolitta") that sounds a lot like part of "Pirate Jenny" from *Threepenny Opera*. There's no "big" song, no "Stranger in Paradise," and the book, at least as judged by the synopsis, is a more-than-legitimate subject of carping.

The cast is generally very fine, certainly much better than one could expect in any stage revival. Faith Esham has a lovely voice and uses it to good effect in the role of Maria. Tony winner (for *Phantom of the Opera*) Judy Kaye is widely known in musical theater circles as one of the most gifted and versatile performers around; here, she turns in a deftly comedic Madame Teresa, the owner of a little Parisian café who joins her friend, General Carabana, on a trip to Colombia, having been told by her personal astrologer that emeralds figure prominently in her future. In Colombia, at a fiesta welcoming General Carabana, Pedro, a Muzo Indian rebel and sometime bus-driver, leads drunken Indians of the pagan Chivor tribe to steal the statue of the Miracle Madonna, an act that understandably upsets the devout Maria, who loves Pedro, and—oh, never mind.

Kevin Gray is an ardent Pedro, although I wish his voice had a more ingratiating timbre, like, say, that of John Raitt, the role's originator, or Jerry Hadley, who makes a cameo appearance here as The Old One, singing the haunting title song. Conductor Evans Haile, who conceived the concert production of this work, maintains good control over the extensive vocal and orchestral forces. Sound quality is fine, with a bit of congestion in the ensembles. *Magdalena* is not a neglected masterpiece, but it is an intriguing work (Ken Mandelbaum, writing in *Theater Week*, refers to it as "fascinating kitsch"); we can be grateful to CBS for allowing us to hear it. —Robert Deutsch

**Jazz**

**TUCK ANDRESS: Reckless Precision**

Tuck Andress, electric guitar

Windham Hill Jazz WD-0124 (CD only). Tuck Andress, eng., prod.; Avatar Meher Baba, exec. prod. TT: 49:50

A little Hendrix, a little more Stanley Jordan. Some jazz, some folk, blues-influenced too. Tuck Andress, half of the better-known husband-and-wife duo Tuck and Patti, offers a solo electric guitar affair, a stylistic and discographic smorgasbord that involves a veritable mish-mash of influences.

Taken at face value, this is a nice date, ambitious and well-recorded, a proficient project bound to please easy-listeners and up-and-coming guitarists. *Reckless Precision*, however, possesses one major flaw: it's momentary, not memorable.

Part of the problem is that Andress may be emphasizing his evolution too heavy-handedly. Michael Jackson's "Man in the Mirror" opens; no matter how you look at it, this is commonplace pop. And, I'm sorry, the rendition of "Louie Louie," made so famous by the Kingsmen, and recently revived as part of a beer campaign, does not cut it as legitimate, no matter how well it's laid out here. While authentic, even Andress's own "Sweet P," dedicated to his partner, smacks more of early Hot Tuna than anything else; this bluesy affair gives us one more reason to go back and listen to Jorma Kaukonen's and Jack Cassidy's *Live at the New Orleans House*, released two decades ago. Needless to say, given Windham Hill's and, for that matter, Andress's base of operations, it's not too surprising to find the Bay Area written all over *Reckless Precision*. For that matter, tremors from Leo Kottke and the grandfather of new age-ist guitarists, John Fahey, can also be felt, most notably amid Andress's "Manonash," a reference/dedication to a particular state of mind within the executive producer's/guru's philosophy. It takes all kinds.

Does *Reckless Precision* qualify/deserve to be categorized as a jazz record? Well, there's the presentation of Harold Arlen's *Wizard of Oz* medley of "Over the Rainbow/If I Only Had a Brain," and a rendition of "Manha De Carnaval" that, if I'm not mistaken, arrives via
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Black Orpheus. Both selections have been, and deservedly remain, part of Jazz Lit 101, which is to say, it's okay that Andress undertakes such items. However, it means his readings must stand out—and they don't. Same with "Stella By Starlight."

In the end, I'm not sure what we have here other than a genuine, honest effort that's thin at best. Topically, Andress tries to cover the proverbial waterfront—and does. But so what?

—Jon W. Poses

**WYNTON MARSALIS: Standard Time Vol. 3: The Resolution Of Romance**

Wynton Marsalis, trumpet; Ellis Marsalis, piano; Reginald Veal, bass; Herlin Riley, drums

Columbia C 46143 (LP), CK 46143 (CD*). Delfeayo Marsalis, prod.; Patrick Smith, eng. DDA/DDD. TB: 69:48, 73:53*

Whether you think him reactionary, conservative in the best or worst senses, or a true pioneer using seasoned, time-tested, broken-in tools, it's been fascinating to watch Wynton Marsalis grow up in public. Impressed as I was with his first releases in the early '80s, in hindsight I hear incredible tension and tightness, as if the talent that was to blossom throughout the '80s was bottled up behind Marsalis's lips, too much trying to pass through too small an opening.

Well, that mouth is wide open now, relaxed and singing. In this almost-first album (not counting one side of Fathers and Sons) with his father Ellis, the relatively unsung master of New Orleans piano, Wynton is as good as his word: "I always wanted to do an album with him, but I never felt prepared because I didn't play well enough on changes and have a sound good enough to pay the kind of homage to my father that I really felt." Cognoscenti have always agreed with this self-assessment, but now, even though Ellis still nearly steals the show, Wynton's wait seems to have been exactly long enough—the entire album is one vast sigh of relief for players and (this) listener alike. Later on, he says, "I made this album because I'm still working on growth in the arenas where things have been made obvious." A humble statement; hats off to him for making his homework so thoroughly enjoyable.

Briefly, Standard Time Vol. 3 is 18 standards and 3 originalcs on CD (the still-overstuffed LP lacks "It's Easy to Remember"), most for quartet (drummer Herlin Riley's seemingly simple, minimal crossrhythms amaze me with their freshness), with two piano solos and one trumpet trio setting. From "A Sleepin' Bee" to "How Are Things in Glocca Morra?" from "Skylark" to "Big Butter and Egg Man," it's interesting to compare Marsalis's choice of tunes to Keith Jarrett's in the latter's own series of "Standards" recordings: even with both restricting themselves almost exclusively to ballads, Marsalis tends toward the jaunty, funkier tunes, Jarrett toward the more romantic, art-song compositions. But both are absolutely committed to a song's words, unsung though they remain. This is most obvious on The Resolution of Romance: at an average length of 3½ minutes, several lasting less than 2, there's hardly time for more than a once-through of verse and chorus on the majority of these tunes, most of which could have fit on one side of a 10” 78. It's difficult to say what one has to say in so brief a time, but Marsalis does it and leaves me hungry for more; when this richly varied album ended, I immediately put it on again.

One reason I set the CD player on "Repeat" is both Marsalis's amazing relaxation, a far cry from the technically impressive but remotely tenee Marsalis Standard Time Vol. 1 (reviewed in Vol.10 No.9). You'd expect such laid-back support from Ellis—his long lifetime in jazz, his teasing lagging behind the beat, those Monk-ish dashes of tart, rhythmic wildness—but his son's newfound ease and centeredness are revelations. Wynton's been building up to this album—a Great Divide in his musical life—for a long time, and I feel privileged to have heard the moment. Yes, he is finally good enough to make an album with his father. Those unfamiliar with Ellis Marsalis must hear this album to know exactly what that means.

And those frustrated with Wynton's more dogmatic affectations, both verbal and instrumental, must hear this to know that the dude can actually drop his suspenders and cry, laugh, guffaw with the best of them. Vol. 3 is a primer in style, in the jazz trumpet, in the use of all the mutes—straight, bucket, hat, cup, harmonic, plunger (listen to the Marsalis original "The Seductress" for this last—whew!)—but I don't feel lectured by some self-righteous jazz preacher, as I did, literally and figuratively, with the last album, The Majesty of the Blues (reviewed in Vol.12 No.10). Wynton Marsalis may not be a genius, but he is a virtuoso.

Still, this is his least pretentious album, his most enjoyable, and, with the very different Live at Blues Alley (Vol.11 No.9), his best. The man is finally having a good time. So should you. Buy it.

Other than the fact that the LP lacks one tune, my copy had a warp, and CBS's surfaces are asiffy as usual, the 35-minutes-a-side vinyl sounds amazingly good, and better than the CD on almost all tracks—more air, more depth, more there there. Producer/brother/trombonist Delfeayo Marsalis, who has always pointed out his avoidance of a direct pickup on acoustic
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bass, here labels three cuts as recorded with a single stereo mike. My, my, my. (Yes, they do sound better.) As for the rest, the trumpet is miked far too forward, and the drums are surrounded by obviously false ambience. Still, the CD is one of the more natural-sounding DDD jazz recordings I've heard from this label (not saying much, obviously). And for those of you wondering where Marsalis Standard Time Vol. 2 went, it's to be released some time this fall as part of a 5-LP retrospective including all sorts of previously unreleased material. Watch these pages.

—Richard Lehnert

MARCUS ROBERTS: Deep in the Shed
Marcus Roberts, piano; Herb Harris, Todd Williams, tenor sax; Wessel Anderson, alto sax; Scozy Barnhard, E. Dankworth, trumpet; Wycliffe Gordon, trombone; Chris Thomas, Reginald Veal, bass; Maurice Carnes, Herlin Riley, drums

In trying to dissect Deep in the Shed, pianist Marcus Roberts's second adventure as leader, we need to accept, as he insists, that the blues is primary to jazz—at least bis jazz. Given the presentation here, it's difficult, even if you wanted to, to argue with him—what with such compositions as "Mysterious Interlude," a slow blues set in a classic tenor-altotrombone septet where the piano acts as centerpiece. However, a large portion of Deep in the Shed serves as reminder that we also need to comprehend the continuing impact of Duke Ellington, Thelonious Monk, and, to a lesser but still measurable extent, John Coltrane upon such modernists. Not that Roberts would disagree; nonetheless, he provides us with the quintessential example for such theories.

Deep in the Shed may be intentionally blues-drenched, but Ellingtonia is omnipresent, particularly throughout "Nebuchadnezzar"'s brilliantly orchestrated and predominantly austere presentation. Duke's also quite in evidence amid the textures that we can glean from the religious but accidentally witty, slow followup, "Spiritual Awakening," which contains not only Roberts's salient piano solo, but also Wycliffe Gordon's intelligent trombone, muted to perfection.

These days, with a great deal of media assistance, the idiom seems dominated by a crop of relatively new Young Lions. There's the Marsalis clan of course, now the Jordan family, Terrence Blanchard and Donald Harrison, as well as that band of gypsies from Brooklyn, the M-basers. Roberts remains Wynton M.S main man, and half the players here—probably none 30 years-young yet—have worked as members of Marsalis-led ensembles.

The third of the all-Roberts, six-song program, "The Governor" (LP and CD have the same format, but the latter has a brilliant sparkle and tremendous bass-frequency response), swings as hard as anyone could wish. Arranged as a septet, it acts, as does the title track and the Monkish "E. Dankworth" (Roberts's trumpeter's namesake), as clear indicator that these "kids" are dead serious about their commitment to furthering the straight-ahead jazz tradition. Indeed. In effect, the ultimate lesson we receive here: Roberts and his colleagues are well-schooled, and possess the keen ability to look forward as they receive the past amicably—and with a great deal of admiration. Not surprisingly then, Deep in the Shed is a session that we will look back upon and at which we will smile—out of respect.

—Jon W. Poses

Folk

VARIOUS: The Enchanted Isles (Harp music of the British Isles)
Carol Thompson, harps
Dorian DOR-90120 (CD only). Craig Dory, prod., eng. DDD. TT: 52:21

To judge by the spate of recordings released over the last 15 years, the Celtic Twilight has been getting a good deal brighter of late. Even Nashville has gotten into the act, with Anne Baillie ("Baillie and the Boys") sounding more like Marie ni Bhraonain than Patsy Cline, and with Emmylou herself due out with a Celtic record. There are three instruments that represent the soul of Celtic music: the fiddle, the pipes, and perhaps above all, the harp. There is a great deal of lore (and a lot of quasi-mystical nonsense) centered around the harp and the harper; perhaps only in some African societies are personal and cultural identity so involved with music as they are among the Celts.

On this CD, Carol Thompson, a classically trained harpist who now performs and teaches on the folk harp, gives us nearly a score of pieces from around the British Isles (although England is represented only by a token Playford medley), including four compositions by Turlough O'Carolan (properly Ó Seabhailáin), the greatest of all writers for the harp. Thompson's technique is flawless, and I like some of what she does with it, but I have to admit that the whole thing leaves me pretty cold. There are nine Irish harp tunes here, and I never once started tapping my feet. I have no such hesitancy with Derek Bell (Carolan's Receipt, Shanachie 79013); in fact, in Thompson's performance I'm afraid there's a bit too much of the mystical and melancholy—authentically Celtic.

* Why is it spelled like that? Because it's the simplified spelling. silly.
though it may be—and too little of the equally authentic fire, joy, and wit that characterize Celtic music.

Even if you prefer a mystical tinge to your harp music, there's a better choice, namely Patrick Ball (Celtic Harp, Fortuna LP 011). Like Derek Bell, Ball plays a truly authentic brass-strung Irish harp, and gets a great analog recording too.

Which brings us to sound. Heretical as it may be, I think Dorian has truly come a cropper here. The Troy Savings Bank Music Hall is a wonderful venue, and Dorian's lute-song disc demonstrates that you can get an excellent recording of a single instrument in that huge space, but Carol Thompson's harp is here surrounded by a veritable sea of echo. Detail is lost, the low end of the instrument sounds unnatural, and it's just not much like sitting down and listening to someone play a harp. I think all of the reverb is intentional, to emphasize that mystical quality, but it doesn't work. Skip this one and try Bell or Ball, and while you're at it, grab a record called Carolan's Cup (Dargason DM-102), on which the lovely Joemy Wilson rips through a dozen of O'Carolan's best on hammered dulcimer (tiompan to you Irishpersons) with spirited accompaniment. Slainte an beitbne cuigbat!

—Les Berkeley

GEORGE CLINTON: The Cinderella Theory

It's the 1990s. The rock 'n' roll of the '70s is slipping into its second full decade, rendering it inviting victim to popular music's exaggerated sense of nostalgia and panicking those of us who grew up with it and are rapidly becoming less young. (Just the other day I heard on the radio an ad for a dance club pushing disco music from the '70s as a nostalgia experience. Will we never learn?) Those of us who grew up in the '70s will prattle about the greatness of its pop music, about how the pop artists of today are mere shadows of their forbears from our decade. Young pop fans, enviable in their flush of hormonal oversupply, will rightly tag us as aging gaspayers.

George Clinton is one of the dozen most substantial pop artists to peak in the '70s. His career began much earlier, in R&B bands in the '50s. It was with a remarkable series of records which he made—more precisely conceptualized and conjured—in the '70s with Parliament and Funkadelic (not so much two bands as one schizoid P-Funk, a single set of personnel in yin and yang incarnations) that Clinton defined a radically innovative Pop: thematically unified but anarchic albums emphasizing the long line of groove; musical influences drawing heavily from Hendrix heavy-metal guitar, synthesizer, and R&B horn riffs; celebrations of sex and scatology shocking by '90s standards; irresistible invitations to dance; lotsa just plain weirdness.

Clinton's influence on pop music has been enormous. Without it, such diverse musicians as Prince, Talking Heads, B-52's, Clash/Big Audio Dynamite, and the black urban rappers would have made substantially different music, perhaps no music at all.

P-Funk broke up in 1979. Today Clinton records under his own name, attracting all the talented studio help he pleases. Cinderella Theory is only his second album of the '80s. It spans into the new generation the madness and dedication to the groove.

For all of Clinton's influence on later generations of musicians, it's enlightening to hear from this album how they've changed him. On the down side, Clinton makes sometimes indolent use of synthesizer, occasionally wiring himself into the two-four drum machine lock-step which will some day be recognized as the numbing cliché of '80s pop music. To the plus, there is renewed interest in words as well as the funk, which may be attributable to Clinton listening to the rapid-fire rhyming of young rap musicians. Bearing this out are Chuck D and Flavor Flav of the rap group Public Enemy, who appear on one rather meandering cut featuring explicit social commentary uncharacteristic of a Clinton album. They make some sympathetic remarks about the toughness of a city cop's job in this age of crack cocaine, which may deflect some small fraction of the criticism Public Enemy has earned for their racist japes. Cinderella Theory's concept mainly involves women, about whom Clinton, despite his years of experience, remains obsessed ("Cinderella Theory"), heartbroken ("There I Go Again"), heavy-metal lustful ("Rita Bewitched"), and fed up ("Kredit Kard").

For variety he throws in delectable tidbits about constancy to the cause of the groove in the face of commercial pressures ("Why Should I Dog U Out," the best song on the record), and a demented cover of "The Banana Boat Song."

About the only low point I can identify is the monotonous and dreary "Serious Slammer," a song which Clinton, not surprisingly, did not write.

Given the more metronomic pace of Clinton's post-rap beat and its sexual sanitation rela-
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tive to the ’70s which today’s market demands, there is a temptation to label Cinderella Theory as less immediate, less danceable — less funky than the old P-Funk LPs. That’s wrong, for the record had me dancing as good as in my old days. (But I’ll never admit that to my fellow gaspassers.)

— Kevin Conklin

STEVE EARLE & the Dukes: The Hard Way
MCA MCA-6430 (LP), MCAD-6430 (CD). Steve Earle, Joe Hardy, prod.; Joe Hardy, eng. DDA/DDD. TT: 55:53
JOHN HIATT: Stolen Moments

Steve Earle and John Hiatt are both all rock, all country. I listened to Earle’s Guitar Town and Hiatt’s Bring the Family many times a day for weeks after their releases, and I almost never do that.

Both men sing like they’re fighting an almost-losing battle against quicksand. The difference is that while Earle sounds like he couldn’t help seeking out that shaky ground, just to see how it felt, Hiatt seems to have lost his footing on his way to a good time, and is now carefully retracing his steps to make sure he doesn’t do it again.

Earle is an old-fashioned guy who’s not sure which he loves most, his car or his girl, and he’s not dealing with modern life very gracefully. His bicep tattoo on the album cover says “Fear No Evil,” and I do believe Earle’s trying to keep that muscle pumped. The Hard Way is perfectly titled; listening to these tortured songs, I hear a man constantly on the edge of becoming the quintessential American loser (and the quintessential American tragic hero) who, with the best of intentions, does nothing but screw up, redeeming himself only with his absolute determination to get back up on that white horse and ride.

His liner note sets it up: “In the last 3 or 4 years, I’ve been trying to figure out what one does with one’s self once one’s dreams have come true . . . I think I know the answer — find another dream — FAST!!!” That desperation is in every song Earle sings — that’s right — the hard way.

Since his 1986 debut with Guitar Town — probably the best country album of the ’80s — Earle’s records have rocked harder and harder, until something like The Hard Way’s “This Highway’s Mine (Roadmaster)” could almost be called heavy-metal country, in music and lyrics: “Sometimes the only difference between me and this machine / Is I run on desperation / She runs on gasoline.”

But the seriousness, immediacy, and authenticity of Earle’s art is most clear when comparing his “Billy Austin” to something like Springsteen’s “Nebraska.” The Boss’s song concerns an unrepentant serial killer; Earle’s tells of a murderer who turns himself in even though, as he sings, “I knew I should be feeling something / But I never shed a tear one.” And though “Nebraska,” chilling as it is, is sung in the first person, I’ve never believed Springsteen is that person; Earle, his social conscience even stronger since Guitar Town, is so close to Billy Austin it’s hard to tell them apart. Incredibly, this song protests capital punishment, but Earle refuses to load the dice in his own favor: “I ain’t about to tell you / That I don’t deserve to die. . . . Could you take that long walk with me / Knowing hell is waiting there / Could you pull that switch yourself sir / With a sure and steady hand / Could you still tell yourself / That you’re better than I am.” Sobering stuff. Makes all that Willie/Waylon/Johnny/Kris “Highwayman” crap look (and sound) like the scam it is.

“West Nashville Boogie” is a terrifying picture of contemporary high-school life; minimal blues riffs and minimal lyrics about razors, white trash, and pistols hid down by the school. “Close Your Eyes” is Earle’s usual end-of-side killer, a tradition he started on Guitar Town with “Down the Road” and “My Old Friend the Blues.” (The last one still makes me think, every time I hear it, that Hank Sr. didn’t die in the back of that car after all.)

The Steve Earle of Guitar Town is still alive on Hopeless Romantics — “Hopeless romantics are usually hopelessly true” — the sister song to “Fearless Heart” from that first album, even if none of The Hard Way’s songs are carried by tunes as timeless. CD and LP are pretty close, the former a bit fresher in the highs; basic production style is big-beat drums, splashy, chimey electric guitar, and some interesting acoustic mandolin interludes.

Hell, that should be enough. The Hard Way is significant. If you haven’t heard Guitar Town, buy it too. And if that doesn’t mop up any remaining pockets of die-hard resistance to country music, John Hiatt should turn the trick.

(listeners who were disappointed — as I was — with Hiatt’s last album, Slow Turning — reviewed in November 1988), should have no complaints about Stolen Moments, a return to the introspection-with-a-beat funk of his triumphant Bring the Family. Moments is Hiatt’s tenth album (not counting Geffen’s ’Yall Caught? compilation), and it’s a watershed and summation of sorts.

Lord, has this man grown up in the ten years since the neo-wav/rock-punk Costello-clone Slug Line and Two Bit Monsters; his stuff could be easily called roots rock now, à la his sometime studio buddy Ry Cooder. And varied? As Hiatt said in a recent Billboard squib (Aug. 4, 1990): “Sometimes the only difference between me and this machine / Is I run on desperation / She runs on gasoline.”
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Stereophile, October 1990
1990), he can ‘go on 'Hee Haw' and two weeks later get a song cut by Iggy Pop. Or share the stage with the Neville Brothers and then sit next to Roy Acuff at the Country Music Assn. Awards.”

I'm not sure I've ever heard such engaging songs about an imprisoning childhood or the recovery from an alcoholic adulthood. You don't have to know what these songs are about to thoroughly enjoy them, but paying close attention to their lyrics will give you an hour with a man who, unlike Steve Earle—who seems obsessed with his own drama, gripping as it is, almost to the point of monomania—sounds like he could just as easily hear out your problems as confess his own.

But most of all, and like Bring the Family, Stolen Moments is Hiatt's testimony to his own dumbstruck wonder at the miracle of life its simple self—of his wife's love for him, of his own love for his children, of the fact that he's even still alive—the album boils over with the sheer gratitude of someone who was sure he'd never make it. Like Family, Moments is about monogamy, responsibility, life-long commitment; it's a testament to Hiatt's insight, maturity, vulnerability, and seasoned good humor that he makes what most consider onuses sound like fun. This sensibility pervades the entire album, but most of it's dealt with in the title cut as well: "Don't you know we're living in stolen moments / You steal enough it feels like we're stopping time." There are songs about Hiatt's Indiana childhood, and his father. There's his own passionate fatherhood in "The Rest of the Dream," shame and remorse in "Thirty Years of Tears": "Fair women have thrown me their lifelines / And I just pulled them in to the water's dark grin." "Bring Back Your Love to Me" is particularly naked: "I don't want no other lover / I got too much here at stake... Every night I sit and watch for you, baby / I pray to God you haven't found somebody else"—to a great Stax soul groove. There's a song about a fellow rock 'n' roll survivor ("Rock Back Billy"), an undescending one about Native Americans, and one about wisdom—now there's a word that seldom pops up in rock reviews—in the remarkable mixture of Zen and Christian imagery that is "Through Your Hands": "Don't ask what you are not doing / Because your voice cannot command / In time we will move mountains / And it will come through your hands."

The AAA LP is, yes, superior to the CD in warmth and depth; Glyn Johns's production is less bottom-heavy than for Slow Turning, a bit more metallic and wiry, less chunk-a-funk, but seems appropriate for this more introspective material. The Goners, Hiatt's Slow Turning band, are replaced here by names unfamil-

lar to me except for Little Feat's Billy Payne and Ritchie Heyward on a few cuts.

There's lots, lots more here that I'll leave for you to discover, but one thing I can't let slip by is Hiatt's singing: phrasing often like Randy Newman's, nailed fast to a huge, deep voice, utterly relaxed and never straining. The guy talks to you. Once you cut through the professionalism, artistry, and chops, this is what singing is supposed to be all about anyway. Like the music of The Band, Elvis's Sun sessions, the comic art of R. Crumb, and the sacred comic texts of the Firesign Theatre, John Hiatt's songs and singing make me feel prouder to be an American than any scrap of cloth dyed red, white, and blue.

—Richard Lehner

THE NOTTING HILLBILLIES: Missing... Presumed Having a Good Time
Warner Bros 2147-1 LP, -2 CD. Bill Schnee, eng.; Mark Knopfler, Guy Fletcher, prods. DDA/DDL TT: 40:43

Following in the tracks of Paul Simon's Grace-land and David Byrne's salsa-flavored Rei Momo, Dire Straits leader Mark Knopfler has returned from a musical detour south of the Mason-Dixon line with an album of pre-Nashville country standards. Like his cross-cultural predecessors, Knopfler stands to take some flak from purists in Opryland, but if a little foreign exchange can keep just one Whitesnake single off the airwaves, I'm all for it.

Given the band's homage to Jedd Clampett and kin (Notting Hill is a section of London), and the album's tongue-in-cheek title, I half-expected a sloppy, Jack Daniels-lubricated rave-up. What Knopfler, Dire Straits bandmate Guy Fletcher, and British buddies Brendan Coker and Steve Phillips give us instead is a polished, even reverent, collection of little-known country-folk gems. The singing, with Phillips and Coker handling most of the leads, is as smooth as these four slightly gravelly voices will allow; and the instrumental performances have an archival feel, as though these cuts were being preserved for Musicology 101.

While this restrained album asks you to look elsewhere for a heapin' helpin' of hospitalitee, it offers something equally valuable. The Hillbillies' "cool" (in the McLuhan sense) approach is the musical equivalent of seeing your toaster in the design collection at the Museum of Modern Art. You are forced to lean in and really listen to simple songs that could be too easily dismissed as simplistic. Forty-year-old ballads like "Weapon of Prayer" by the Louvin Brothers and the Delmore Brothers' "Blues Stay Away from Me" are straightforward and declarative in a way that seems to have gone out of fashion with the Truman administration. And need-
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less to say, the Hillbillies’ sampler has sent me scouring the bins for more gems from pre-Elvis Memphis. One major oversight is the lack of proper liner notes elaborating on these wonderful songs and the time and place that spawned them. The four originals, one by each of the band members, don’t break the mood, but I think the Hillbillies function first and best as a cover band.

The sound, very much in the mold of a Dire Straits album, is also museum quality—squeaky clean, with tasteful vocal and instrumental processing, and not too much artificial ambience. Although the recording is digital all the way, the LP is significantly better than the CD, with a weightier and better-detailed bottom end and a more spacious soundstage. With its open and forgiving sound, this is the kind of album that’ll quickly find its way into the collection of demo discs at your local mid-fi dealer.

While I ultimately find Missing... more educational than inspirational, that’s not to be construed as faint praise. Any project that can make me take a fresh listen to Charlie “Behind Closed Doors” Rich has cleared a tough hurdle indeed. Still, I’m struck by the irony that, just as it took the Rolling Stones and Cream to resurrect Robert Johnson, it takes four British rockers to give this consummately American music its proper showcase. —Allen St. John

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Editor:
We appreciate very much Thomas J. Norton’s thorough, detailed analysis of the Signet SL280 loudspeaker system, using both subjective and objective techniques. And we couldn’t be more pleased at his conclusion.

There is little in the review with which to take exception. We believe it states fairly the design’s strengths and weaknesses. From the outset, we intended the SL280 to be a “straight-forward” system of relatively modest size and reasonable price, but one in which the innumerable design details and inevitable compromises received exhaustive examination. After quite a lengthy development period, we were finally convinced that the SL280 was “ready” for the outside world of shows/dealers/reviewers/listeners.

We are delighted at Stereophile’s reaction to our efforts.
Gary Post
National Sales Manager, Signet

Esoteric Digital Processors
Editor:
Maintaining objectivity when reviewing three components of diverse price points in the same product category, designed and manufactured by the same company, is an extraordinarily difficult task. I must admit that although I was excited about the prospect of Esoteric participating in a review of this magnitude, and very confident of the performance capabilities of the Esoteric product line, I was a bit apprehensive about how Robert Harley and Stereophile would approach this review.

After reading the three reviews of our D/A converters, I must compliment Bob and Stereophile on a job well done. His ability to treat each product as an entity unto itself was essential, and to that end he succeeded admirably. Before I turn my comments into an advertisement for your magazine, let me make a few remarks about the reviews themselves.

With all Esoteric products we have attempted to offer the music enthusiast the best combination of quality and performance. Bob’s reviews clearly point this out. Each of our D/A converters is a unique product with its own sonic signature, designed to offer the highest level of musicality and quality of construction we can provide for its price and still share a common bond of aesthetics and design philosophy. They are also designed to complement and gracefully interact within the systems into which they are integrated. The fact that Bob pointed out demonstrable improvements in each successive model verifies this philosophy.

In his conclusion regarding the D-500, Bob describes the “velvety textures,” “smoothness,” and “unfatiguing” qualities of the D-500, and points out that the D-500 “came fairly close to the musicality” of a processor “-priced 30% above the D-500” (which he mentions happens to be one of his favorites in the price range). He also offers that, in his reference system, “I felt that the D-500 was too laid-back and polite in the treble.” The D-500 and its companion transport, the P500, were truly designed for use in systems a bit more modest than Bob’s. In designing them we consciously addressed them to the attributes of the systems in which they will most likely be used, which, as Bob points out, are usually a bit more forward or strident in the treble region. Just as turntable/tonearm/cartridge combinations will sound different in each system that they are a part of, so too will CD transports and D/A converters. What counts ultimately is the sum of all the parts and the symbiosis that takes place between the components, the system, the listening room, and the listener. Auditioning in a system will help to create this symbiotic state and prevent a mismatch.

Regarding the D-10 and D-2, Bob states, “Overall, I very much enjoyed listening to music through the D-10—the ultimate statement of its worth,” and “As I began to go through my CD collection, I found music so enjoyable through the D-2 that I put down my notepad and just listened for a while... The more I listened to music through the D-2, the more I liked it.” Of all the wonderfully complimentary things that Bob says of the sonic attributes, quality of manufacture, and fit and finish of the D-10 and D-2, those are the statements that make us most proud. Evoking the emotional experience of music is what it’s all about. If we can help to unearth those emotions through the use of our products in an audio system, we are indeed pleased.

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in the marketplace, we are delighted to have passed our first litmus test from the audiophile press with, in our opinion, flying colors. When three of your first group of products are favorably compared and contrasted with benchmark products in their price range, what can we say except thanks for the opportunity to be heard. It makes all the work and sweat it takes to bring products such as these to market worth it.

The remote control that Bob describes is supplied with the P2 transport, not the D-2 D/A converter. The front panel of the P2 transport was designed for simplicity and elegance and to match the appearance of the D-2 converter. As a result, only critical functions such as Play, Pause, Skip, Open, and Close are provided for on the front panel of the transport. The remote control contains all the advanced programming functions and direct access functions for the transport, as well as the control of such unique functions of the D-2 D/A converter as the attenuation, absolute phase reversal, and muting, which all take place in the digital domain. If the purchaser of a D-2 would like the remote functions of the D-2 available, we will be glad to supply a remote control on a special purchase basis through our dealer network.

Mitchell R. Witten
Sales & Marketing Manager
Esoteric, a division of Teac America, Inc.

Focal Aria 5 loudspeaker kit
Editor:
I thank Dick Olsher for his thoughtful and thorough review of the Aria 5. It is most gratifying to have him find in the Aria 5 all the attributes I tried to design into it. My goal was to provide the audio hobbyist with all of the traditional qualities of a monitor loudspeaker system plus robust bass and true dynamic range at a very affordable price. Putting aside differing tastes in tweeters, I believe Mr. Olsher’s summary affirms the achievement of that goal.

Regarding his question “Will the real Aria 5 please stand up?” the second sample is my obvious reply. The T90K is very sensitive to mounting. The rebating of all drivers into the front baffle of the maple cabinet is more than a “nice touch,” it is absolutely essential to the performance attained by the second system (as are the radiused cabinet edges). Early samples of the Watters and Woodstyle cabinets were routed too deeply, leaving a step of almost \( \frac{3}{4} \)" between the tweeter mounting flange and the baffle. This discontinuity caused a 6dB peak in response in the 4 to 6kHz region, which shows up clearly in JA’s measurements. This peak is largely responsible for the forward, aggressive sound of the first system. Kimon Bellas has taken steps to correct this problem in future production. I strongly recommend that owners of current-production cabinets shim the T90K flush with the baffle and fill in any gaps between the flange and cabinet with a suitable self-hardening filler. With this done, the real Aria 5 will stand up.

The cabinet problem clearly points up that no detail is unimportant when building a high-end loudspeaker. In addition to cabinet construction, the crossover-network plans and cabinet-lining suggestions must be followed exactly if the performance you have shown is to be realized.

I must take exception to DO’s comments concerning the Extended Bass Shelf (EBS) alignment. All alignments represent some compromise or tradeoff. What DO failed to mention is that an optimum EBS alignment for the 5K013 Ls would require an internal volume of over 30 liters, taking the Aria 5 well out of the minimonitor class. The bass extension of the EBS comes at the cost of a 4 to 6dB loss in power handling, relative to the QB3 in the octave where the latter has its greatest output capability and where most orchestral bass energy is concentrated. Furthermore, both alignments are fully unloaded at subsonic frequencies and will therefore exhibit identical stress with LP playback (as DO suggests, all bass-reflex systems will benefit from a subsonic filter during LP playback). Finally, the QB3 alignment mates much better with the Aria 5’s matching subwoofer, the Aria 10, than would an EBS alignment.

I point out that the deep dip in response just below 200Hz shown in his figs. 5 and 10 is probably due to a floor-reflection cancellation at the 1m microphone distance and is not representative of the in-room response at normal listening distances.

Joseph D’Appolito, Ph.D.
Consultant, Audio and Loudspeaker System Design

Editor:
I wish to thank Stereophile, and Dick Olsher and John Atkinson in particular, for their thorough and searching review of the Aria 5. The
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wisdom of Stereophile's policy of submitting a draft of their review to the manufacturer clearly was demonstrated in this review. The opportunity to submit a second sample was invaluable. As Dr. D'Appolito pointed out, the early cabinets benefit from his suggestion. Current-production cabinets have been modified to duplicate the quality of the solid maple cabinets.

In our view, the Aria 5 is truly a high-end kit. Our concepts provide the most advanced engineering along with the necessary components. Upon that secure platform the constructor who carefully follows our guidelines (detailed in our free pamphlet) can move closer to perfection by choosing among the finest of capacitors, wires, terminals, etc. Extra care can advantageously be lavished on cabinetry.

Tweeter choice is largely a matter of taste, and over 5000 have chosen the concave-dome Kevlar T90K tweeter for its extraordinary qualities of breathtaking dynamics and image realism. I personally have a set of Aria 5s, and every time I listen to The Seven Last Words of Our Savior on the Cross with the Orchestre de Chambre de Catalogne (recording by André Charrin), or to the Impromptus interpreted by Rudolph Buchbinder (Teldec 1979), the emotion comes free-flowing, with great power. I love my Aria 5s for that.

In closing, I compliment Stereophile for its candor and precision in reportage.

**Kimon Bellas**

President, Focal America, Inc.

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**Plateau Camber 3.5ti loudspeaker**

Editor:

I would like to thank Robert Harley for his excellent in-depth analysis of the Camber 3.5ti loudspeaker. As the designer, I would like to clarify a few points.

First, the Camber 3.5ti is now available with a dual set of gold-plated five-way binding posts, thus allowing bi-wiring. A set of gold-plated jumpers is supplied for less ambitious setups. The low-pass and high-pass sections are now mounted on separate boards, the high-pass section utilizing metalized polypropylene capacitors. The result is, in my opinion, a much smoother response in the treble region.

The woofer filter is a second-order low-pass section that does contain a series inductor. The source of ringing in the "classical" second-order section is the result of a resonance caused by the woofer's natural inductance and the shunt capacitor is in series with a resistor which critically damps this resonance.

It does not surprise me that Mr. Harley found the midrange smooth and relatively uncolored, since this has always been Camber's number-one design criterion. The 3.5ti's excellent sense of space and depth is a direct result of the lack of midrange colorations. (Has anyone ever heard a colored speaker that had excellent imaging characteristics?) In the bass region the speaker must work with the room. The fact that Mr. Harley liked the bass response of the 3.5ti indicates that he used appropriate care in setting up the speakers.

All speaker designers have to address the treble response with special attention since today's software is so variable in this region. Because the 3.5tis are being used as studio monitors for the Canadian Broadcasting Corporation, I opted for a truly flat response in this region. As Mr. Harley points out, the frequency-response plot exhibits less high-frequency rise than he expected. I generally dislike the use of tone controls, but find that until software manufacturers can agree on some sort of norm (may I suggest neutrality?), a treble control is a needed vice. That Mr. Harley could improve the HF response through careful placement should indicate that the problem is not severe.

I agree with Mr. Harley that the ultimate statement about any product is, "I enjoyed listening to music through them." That this enjoyment comes at a reasonable $700/pair is a nice bonus.

**Allan Devantier**

Plateau Camber

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**Fried Q/4 loudspeaker**

Editor:

Thank you for Bob Harley's review of our Q/4. Bob well and fairly covers the design objectives and the performance of the Q/4s, the latest of the Q series, stating that they offer "a consistently high level of musicality for their price."

I do want to offer a further rationale for the "line tunnel" approach, as contrasted to the more usual sealed or reflex-loading systems. This rationale is, of course, derived from my long-time espousal of transmission-line concepts of loading. It is simply that by doubling the radiating area, as the line tunnel does, piston excursion is reduced; and by creating an auxiliary source of low-frequency energy, the propagation pattern of the Q/4 in the bass is

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transformed from "spherical" to "plane source." The listening result is that, as Bob states, "both LF extension and sense of weight and power through the midbass were remarkable."

Again, thank you for a fair and balanced review of our Q/4. Irving M. Fried
Fried Products Company

Triad System Seven loudspeaker system
Editor:
I would like to thank Bob Harley for his enthusiastic, thoughtful review of the Triad System Seven. He obviously devoted a great deal of time and emotional energy to evaluating the system. He has successfully conveyed the joys and agonies of trying to optimize a high-performance satellite and powered woofer system. He even demonstrated that rare (in reviewers and designers) quality of humility by indicating he wasn't sure he got the best performance possible from the system.

His measurements confirm the system's exceptional frequency and phase performance, while documenting its two weaknesses. There is a small dip at about 150Hz, and a hump in the extreme high-frequency response above 11kHz. Readers who would prefer added mid/upper bass warmth at the expense of the bottom quarter-octave of bass may want to try the System Six Woofer with the System Seven Satellites. All Triad Satellites and Woffers are available separately.

The peak at 12kHz is a characteristic of the Vifa tweeter used, but I think the particular equipment used for the review may have accentuated its impact. I chose to integrate the tweeter as smoothly as possible with the midrange driver and accept the bump at the top end, rather than lower the overall tweeter level.

As the review mentions, the rotating tweeter allows you to tailor the high-frequency response to your own taste. I have had very few comments from our dealers or consumers concerning the amount of high-frequency energy from the Seven Satellites; perhaps the mid-fi equipment more typically used with our products lacks the high-frequency resolving power of the test gear.

Finally, I am grateful you have made your readers aware of the truly exceptional properties of the system. It is gratifying to hear you say it has elements of Class A performance. We are a small company quietly trying to supply as much performance as possible in an elegant, affordable package. This means we spend our money on the drivers, crossovers, and fine finishes instead of marketing blitzes, and we rely on reviews and word of mouth for our growth. Thanks for helping it along. Larry Pexton
Triad Speakers

Dahlquist DQ-12 loudspeaker
Editor:
We want to thank Thomas J. Norton and Stereophile for his follow-up DQ-12 review, conducted under a new set of conditions. Even small variations in room conditions can result in major changes in tonal balance and imagery. We encourage reviewers and consumers alike to experiment with room placement to achieve the best combination of balance, bass response, and soundstaging. Michael Russo
Dahlquist, Inc.

Magnum Dynalab FT-101
Editor:
Don Scott's "second recommendation and vindication" of our FT-101, in its updated configuration, is high praise indeed. However, the purported 10% increase in performance indicated by Mr. Scott may be misleading to some. The original FT-101 has an Adjacent Channel Attenuation (narrow) rating of 20dB. The updated version is rated at some 30dB, which, in itself, is much more than 10%.

As for Mr. Scott's reference to the updated FT-101 being "80% as good as the best modern tuners," and "will satisfy 75% of the listeners who use it," we construe that to mean that perfection is still the goal.

M.C. (Marv) Southcott
Magnum Dynalab Corp.

AudioPrism 6500 indoor FM antenna
Editor:
We at AudioPrism are pleased with Bill Sommerwerck's review of our model 6500 indoor FM antenna in the September issue.

We manufacture a complete line of indoor FM antennas. Each model has been designed to specifically address one or more of the varied problems associated with the reception of FM. Our design approach has been the same on all models: completely passive and correct physical size; miniaturization, unfortunately, does not work on an antenna.

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We would like to point out that the model 6500 is equipped with a switchable 12dB purely resistive attenuator that reduces front-end overloading of the receiver.

We hope that Mr. Sommerwerck's in-depth review on FM reception will motivate your readers into dusting off their receivers and giving FM listening another try.

Sam J. Lewis, President
Victor M. Tiscareno, Director of Engineering
AudioPrism, Division of RF Limited

Monster Movies
Editor:
From the tone of the letters from Mr. Mangini and Mr. Blake, they do not seem to appreciate that the improvements of using higher-quality cables in the recording of music and sound for films can be translated into improvements in the final product.

In fact, calling the concept "ludicrous" shows a total lack of understanding of what we, as audiophiles, have known for years: that cables, even in short 1m lengths, contribute substantially to the sound that we hear, and that the distortions in cables are much more significant than most people at first believed.

These gentlemen say that differences in cable are not audible—that is not what other people in the film industry, who work with our products, say. Mr. Mangini stated that he heard no differences between Star Trek IV and Star Trek V, but did he do any controlled listening? How do you compare two different recorded sources and draw a meaningful conclusion? Did he use the same sound system and equipment in doing the comparisons? Or was there a preconception that the cables could not possibly make any differences that led to their biased tone and negative conclusions? In fact, according to our records, we sent Mr. Mangini and Mr. Blake (who have their own sound company together) cables for their evaluation, and they were sent back to us unopened.

It's no secret that we've made substantial improvements in the recording of music and sound in the studio, not only by replacing short 1m lengths such as in a home audio system, but multiple lengths of really poor audio-quality cable of up to 200'! I don't think any reader of Stereophile would be able to tolerate that length of "standard issue" studio wiring being hooked up to anything in his or her system.

It is exactly this closed-minded attitude, that products like cables "can't make a difference," that has separated the audio listening audience from the "professionals" who create the work. This approach has stagnated the industry into recording sound that's as bad as it has been for so many years. Even today, Mr. Mangini and Mr. Blake are right—the soundstages, dubbing studios, and post-production studios are full of miles of bad-sounding conventional cables, old mixing consoles with outdated electronics, poor-quality corroding connectors, corroded patchbays using inferior cable with tarnished brass connectors, bad-sounding effects machines, and a host of other equipment that is responsible for some of the horrible sound on film and music soundtracks, and which lags far behind the sound quality of even moderately priced consumer equipment. Although things have improved tremendously (especially with THX and Dolby in theaters and LaserDisc reproduction in the home), film sound is still far from audiophile quality. But we do hear the difference. After all, the recordings that we, as audiophiles, listen to at home are sometimes recorded with hundreds of feet of inferior cable. Yet we can and do hear the improvements in final playback by changing the last 1m length at the end of the playback chain.

I'm pleased to say that [Mr. Mangini's and Mr. Blake's] opinions (to which, of course, they are entitled) are not the opinions of many of the people who have been involved in the recording of music and Foley using Monster Cable, including Ed Bannon, the chief engineer at TA Soundworks, where the Foley for Star Trek IV was done, and the person they were working for, namely the executive producer, Mr. Ralph Winter. Mr. Winter was involved with other Star Trek projects, and liked what he heard with the Foley work in Star Trek IV. The Star Trek V project was a joint effort between Mr. Winter and ourselves, and he endorsed Monster Cable for use whenever possible. He showed his support by giving us a screen credit.

In regard to their comments, we did some research. Here are the facts as we know them: • Mr. Blake is mistaken when he states that the music for Star Trek V was not recorded with Monster Cable. When we worked on the project with Mr. Winter, it was our joint desire to have all the sound and music go through Monster Cable in the recording process. For this purpose, special cables of M1000 and our Series One microphone cable (similar to our Interlink

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Reference 2) were made up and used to record the entire film score on Paramount's own scoring stage. We verified this with Bruce Botnick of Digital Magnetics, who was the recording engineer for *Star Trek V*. We were also at one of the sessions, and saw the cable used for ourselves. Unless they changed the cables in mid-session, it was all done with Monster.

- We also met with the many engineers at Paramount to satisfy their cable requirements for other sound and production parts of the film. We even made up special cables for the dialog and the Foley stage at Paramount, including the sound transfer interface. We were able to confirm their arrival and hookup, but could not confirm the extent of their use in the sound transfer stage.

- We confirmed that all the Foley for *Star Trek IV* was done using Monster Cable technology at TAJ Soundworks.

- In regard to the recording of *Empire of the Sun*, engineer Shawn Murphy not only used M1000 on all the microphones to record John Williams and his 100-piece orchestra and 50-piece choir, he totally bypassed all the existing consoles and standard wire on the soundstage, and went directly from the microphone preamps into the two 32-track Mitsubishi digital recorders. I know, because I was there. Not only was it a thrilling event to witness (and to see John Williams in action), it is one of the best recordings (very smooth and natural, with a lot of depth) that I have ever heard of orchestra and choir, and, to this day, the finest-recorded musical score that I have heard. I use it as one of my reference recordings; it is available on Warner Bros. 9 25668-2 for *Stereophile* readers who would like to hear it for themselves. For this, we were given our first film credit.

After the recording, Shawn Murphy, along with Bruce Leek and Joseph Magee (recording engineers for Telarc), bought the cables for their own use in their other projects. This was at great expense to them, but they obviously felt it was worthwhile enough to purchase for use in their other music recordings of film soundtracks.

In regard to the music for *Indiana Jones and the Last Crusade*, this too was recorded by Shawn Murphy using the Monster Cable M1000 he purchased. While it is true that, for post-production, the Lucasfilm Skywalker Ranch is "almost (totally) wired with custom-made cable from another manufacturer," it is also true that they use Monster Cable for many of the cables from the mikes to the house wiring.

In regard to Foley work, Mr. Mangini and Mr. Blake are obviously nonbelievers that cables can make any difference and that Foley itself is unimportant to a film. Yet I doubt that they have done any direct comparison with Foley soundtracks done with and without Monster Cable.

And about their comments that Foley is dead and unimportant to a film—well, nothing could be further from the truth. Foley recording, which is the art of recording almost all the sound effects you hear on film, is what gives a movie its realism and its impact, and certainly does bring us closer to the real experience. In fact, Foley sound recording is much more critical than music recording because it involves recording extreme dynamic range, from the rustling of clothes to the impact of an explosion. The subject matter, too, is much more critical, since we are all familiar with the jingle of keys, the clanging of plates, the sound of running water, or the shuffling of feet—real-life experiences which we know and identify well. Alterations to the sound are immediately noticed and give the viewer the impression that the sound is a recording of the sound, instead of the sound itself. Even small differences enhance this reality and impact the viewing audience. You really have to be in a Foley studio to appreciate the difficulty of recording these sounds accurately.

And as to the wiring of the Mann Village Theater in Westwood and how good it sounded, I believe that Mr. Blake was in the minority of the over 1000 attendees. There were people there, including the personnel at Mann theaters and Ralph Winter himself, who have seen the very same film dozens of times in the same theater before and after the wiring, who remarked that they have never heard it sound better, and that the improvements were more than they expected.

In fact, in a videotaped interview with Mr. Winter afterward, he commented that he had heard details and nuances that he had never heard in a theater, only on a studio soundstage. He felt that the improvements in the Mann theater more closely reproduced what the producers of the movie intended, and that now the Mann Westwood is probably the premier movie house in the country. All the cabling at the Village theater, from the heads on the projector.
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to the self-powered Kinec subwoofers, were wired with M1000. All the JBL speakers were wired with M1, at an incredible expense of man-hours and cable expense to the theater. It took nearly 4000' of M Series product to replace all the wiring in the theater; and they say it was inaudible! Mann theaters was impressed enough to have since wired five other THX theaters with Monster Cable, all bought and paid for. And, indeed, the applause and cheers began with the impressive reproduction of the THX trailer, which I'm sure this special audience of industry people has heard many times in that same theater.

TAJ Soundworks is perhaps the leading Foley studio in Hollywood, not only because of the caliber of the Foley actors, but because of the high quality of their sound. I learned about Foley from Ed Bannon, TAJ's chief engineer, who attributes the sound of the studio entirely to the use of Monster Cable technology. These are his words, not ours. They are involved in most of Hollywood's top films, and are booked year-round for not only the quality of the Foley actors whom I've met, but also because of their tremendous reputation for putting down great sound with startling realism.

In fact, Ed was probably one of the most adamant of nonbelievers when we first met him at the newly built Tres Virgos studios in Marin County. He is a perfectionist in his craft, and when I met him, he was very disappointed in the sound that he was able to obtain at the time, even though he used state-of-the-art equipment with all the latest technology (including Live-End Dead-End acoustic techniques). He did everything he knew how, yet he was disappointed with the results. It was not until Bruce Brissin and I brought him some Interlink Reference cable for him to try (in 1983) that he discovered that a major cause of his frustrations was actually in the cable! He, like other recording professionals, had a difficult time believing that cable distortions were as significant as they are. In the years that followed, Ed became very attuned to what our cables could do. He discovered that not only was there more presence, detail, and dynamics, the quality of which never got through EQ, but that the dynamic noise floor was significantly lower (extremely important in Foley work).

Ed tells us he has since rewired every piece of cable within reach of a soldering tip at TAJ Soundworks, including the internals of consoles, recorders, and other equipment, with an audible improvement at each link. Audiophiles know what a meter of cable can do; just think what happens when you replace 20' or 100' of "standard issue" with one of today's high-quality audio cables. Without even mentioning that he'd changed anything, the Foley actors even commented, "What did you change, Ed? It sounds better."

And to anyone who thinks that these people can be bought—NO WAY! They don't say anything they don't believe in. Ed spoke on the benefits of the use of cables in his work at a seminar we did during the 1987 AES convention in New York. He and seven other professionals (including Jack Renner of Telarc, Tom Jung of DMP, and Bob Ludwig of Masterdisk) attempted to educate other professional engineers about the distortions found in ordinary cable. This was done all on Ed's own time (and we'd like to thank them and the others who participated). A transcript of this historic meeting is available from us on videotape.

As for the claims of the cable's performance and its importance in the role of filmmaking, these are well-documented facts in a taped interview with Mr. Ralph Winter, the executive producer of Star Trek, taped interviews with Ed Bannon, and the taping of the cable seminar we sponsored during the AES (but not affiliated with) in New York. I will make copies of these interviews available (at no charge) to any Stereophile reader who would like to have more insight into this fascinating industry.

Please write me at: Monster Cable Products, Inc., Attention: Noel Lee, 274 Wattis Way, South San Francisco, CA 94080-6761. Please mark this "Movies."

It's not our intention to imply that our cables supersede the talents of those who use them. Cables are only tools for the craftsman; but better tools can and do produce better products. Advancements made in professional recording circles come very slowly, one step at a time. People are reluctant to change, and some do not accept new ideas easily. But the significance of the recognition of Monster by many professionals in the film and recording industry is to open peoples' minds to some of the seemingly crazy things (from their point of view) that audiophiles do. We are their audience, and some of the things that we hold important are not so crazy after all. Noel Lee

Head Monster, Monster Cable Products, Inc.
The cost of bad advice, or an inappropriate acoustic/electronic interface will far outweigh a savings of a few dollars.

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TAJ Soundworks

Editor:
Recently Mr. Noel Lee of the Monster Cable Company sent me some correspondence Mr. Larry Blake and Mr. Mark Mangini had sent to your magazine. Since this is not the first time that these questions have come across my desk, I have decided to respond. I would like to completely clarify the many stories once and for all. To do this, I would like to tell the whole story from the beginning.

As Mr. Noel Lee states, it all started in 1982. I had just helped complete construction on the LEDE recording studio Tres Virgos, located in Marin County, California, with Chips Davis. After completion, I stayed in their employ as acting chief engineer, because at that time Chips and I were designing Cresendo Studios, being built in San Juan, Puerto Rico. Being at Tres Virgos would enable me to reassemble certain systems for the studio because of the similarity in design.

Shortly after opening the studio, I received a phone call from the Monster Cable Company's sales department. They asked me if I could meet with them. Because we had just opened up the studio, I was pressed for time and I really didn't want to spend an hour listening to someone trying to sell me some fancy wire, so I said no. They responded by telling me that their engineer was also coming and they wanted me to meet him. I thought this might be interesting because I might learn something new, so I said yes, and a time was arranged to meet them at the studio.

On that day, Mr. Howard Bennett from the sales department of Monster Cable and their design engineer, Mr. Bruce Brisson, called on me. My patience began to grow thin as Mr. Bennett spent 30 minutes talking double-time. Just as Mr. Bennett was starting the same sales pitch for the second time, Mr. Brisson stepped in and asked Howard to be quiet for a minute. He said that it was obvious that our welcome was growing short. He said, "Ed, I would like you to try something for me, just one thing. If it works as I believe it will, call me and let me know. If it doesn't, well, it's been nice meeting you."

The tip that Mr. Brisson asked me to try was a different method of terminating a cable. He asked if I was using a spade or banana plug to terminate my speaker cable. I had been using spades. He suggested a banana plug that Mr. Bennett had brought as samples, but with one modification. I decided to install the bananas without telling anyone else at the studio. Late that night I modified and installed them exactly as he had instructed. The difference was staggering. The bass and lower midrange came alive. The next day the staff at the studio asked me what major change I had made to the system "overnight." I, of course, called Bruce the next day and related the experience to him. I asked if we could meet again, soon. A long-term relationship ensued. Bruce and I have done much work together since that time.

Toward the end of 1982, I received a call from Mr. Allan Goodman of One Step Up Recording studios in Hollywood, California. He told me of a plan that he and two others had, of setting up a dedicated Foley stage at his studio.

They asked me if I would come back and make it work doing this type of work, and would I also accept the position of Director of Engineering. I accepted their offer. This type of dedicated Foley studio had never been attempted before. In doing this, TAJ Soundworks would break all the ground and reset all the rules.

As Larry Blake points out in his letter to Stereophile, Foley has become more extensive and elaborate in the past few years. Also, as Mr. Blake points out in his same letter, TAJ is recognized as "one of the best in the world." After making the initial commitment, TAJ did three things in becoming the best. As Mr. Blake also points out, TAJ assembled a talented group of recording engineers. John Roesch (the J in TAJ) also hired and trained one of the best staffs of Foley artists anywhere in the world.

But what about the third ingredient, the world-class sound that TAJ has created over the same time period, the TAJ sound, as it is now known?

This was one of the primary goals in the beginning, and the reason that I was hired. This was one of John's major bitches when working on the existing Foley stages at the major studio lots. John would continuously ask, why couldn't he or his engineer make out their sounds clearly on the playback systems currently in use at that time? Why did they continue to have to repeatedly perform take after take? He was waiting until someone could come up with a different way to create the sound and/or a different miking technique. Simple jobs that should have taken 5 minutes would take 15 or 20 minutes. Total satisfaction

Stereophile, October 1990
The Magic of Music

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Optimal Enchantment

Winner of the “Best Sound” at the first Stereophile Hi-Fi Show in Los Angeles. 213/393-4434
By appointment in Santa Monica
with the final product was hardly ever realized.

One Step Up Studios was an old Rock and Roll studio. When I was director of engineering there in the late '70s, I could never get a good or neutral sound. The control room itself was of improper dimensions. I had been on a witch hunt during the entire time of my employ in the late 1970s.

To overcome these old problems, I immediately asked Bruce for his help. Since he was still with Monster Cable, we struck up a deal with Noel. Noel would supply us with cable, and for this we would try to get Monster Cable some movie credits. It was also agreed that Monster Cable could take credit for any improvement in the sound because of the direct use of their products, but only with advance written consent from TAJ Soundworks.

Shortly after this happened, Bruce left Monster Cable to form his own company, Music Interface Technologies. During the following year many Monster Cable products were installed in our studio. I have rewired most of the internal wiring of the MCI JH528 with Interlink Special and Interlink 400. But during the last year any new internal wiring has been replaced to use MIT PC-2 products. Amplifier to speakers use MH-750 Shotgun. These cables are terminated directly into the speakers. However, between the Deane Jensen/Boulder amplifiers and the Shotgun cables are especially built "Polyphasors" that Bruce originally designed for my use while still at Tres Virgos Studio.

Sometime in 1985 I was having problems with our Shotgun Microphones (a bloated and masked midrange and bottom end). Because this is a balanced mike, I could not use any of my existing products. I was convinced that I was going to have to build an equalizer to cure the problem. I asked Bruce to come down to help me. He flew down and took some measurements, and said that it wouldn't be necessary. Several months later he called saying that he had the cure. He had designed a better mike cable. I installed the new cable and the problem went away. He later returned with some new Polyphasors built especially for microphones. Together with the new balanced microphone cable, they had contributed to the TAJ sound more than any other single interface that we have attempted.

During the entire period of 1984–1987, I kept asking Bruce if we could give him the credit. He declined, saying that Monster was trying to break new ground in the Pro Industry, and that they needed the help. "Continue to give them the credit," he said. He was not, and never has been, interested in this end of the business.

However, two or three years ago Noel showed up at one of the Consumer Electronics Shows telling everyone that he had made all of these accomplishments. This created a problem with Bruce's new marketing company, Transparent Audio Marketing, who evidently didn't think that this was quite fair. That is, Monster Cable was using Bruce's goodwill to sell against MIT. At Bruce's request, we sent Monster Cable a letter asking them to stop using our name and the films' names in their advertising.

For the record, I would like to state that there are three reasons for the "TAJ Sound": Bruce Brisson and MIT; Deane Jensen transformers, 990 op-amps and Boulder amplifiers; and Monster Cable, in that order. I hope that this helps to clear the record. I could go on for days about all of this because this is really only the tip of the iceberg—things like totally rewiring another MCI JH528 console, MTM mag film machines, MCI JH110 tape recorders and, yes, $300,000 worth of NED's "Synclavier."

Edward Bannon
Director of Sound/Partner
TAJ Soundworks

Icon Acoustics

Editor:

Having exhibited at Stereophile's High End Hi-Fi Show this past April, I wish to both thank you and congratulate you for having done such a fine job of organization (though getting the exhibit in and out was . . . um . . . interesting).

It was with pleasure that I read Tom Norton's show report in the August issue, though it would have been even more enjoyable had our phone number, (800) 669-9662, been included (our phone number is especially important to our customers since it's the only way they can arrange to audition our speakers).

It was also great to see our modestly priced speakers ranking in the "Best Sound at the Show" balloting. However, we were a bit puzzled to see that the electronics associated with our exhibit were from Audio Research, when in actuality our exhibit featured the Mark Levinson No.26 preamp and No.23 amp. We have been very happy with the performance and reliability of the Levinson equipment, as well as their friendly and responsive customer ser-
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Swan’s Speaker Systems

Obviously we were gratified to see Swan’s Speaker Systems near the top of the “Best Sound at the Show” listing in the August issue. Unfortunately, the listing did not include an entry for the “Equipment Featured.” Since that equipment was generously loaned to us by the manufacturers, I would like to thank them in print. The equipment was:

- Krell: pair of KSA-80 amplifiers and KSP-7B preamplifier
- Wadia: 32X D/A processor
- Philips: Bitsream CD player
- Curcio: modified Magnavox CD player
- A.J. Conti: Basis turntable
- Graham Engineering: Breuer arm and Koetsu cartridge
- Transparent Audio Marketing: Shotgun and CVT cables
- Dorian, Harmonia Mundi, Chesky, Titanic, et al: recordings
- And, of course, our own Leda/Gemini loudspeaker system

Swan’s Speaker Systems

Isosonics PCM 44.1

Editor:

We are glad that Peter Mitchell sees some virtue in PCM digital recording (“Industry Update,” August 1990). He correctly notes that VHS tape is an order of magnitude less expensive than DAT tape and that PCM-encoded video tapes have none of the compatibility problems that plague DAT. He mentions numerous discontinued Japanese products but fails to mention the Isosonics PCM 44.1, the only currently available PCM unit. As an owner of a Sony PCM 601, I was especially amused by Mr. Mitchell’s praise for the unit and suggestion that one use it as an outboard D/A converter.

Mr. Mitchell must love the sound of no oversampling, cheap phase-distorting brickwall filters, and cheap nonlinear D/A converters. Oversampling is not a fad; the cheapest, oldest Magnavox CD player sounds and measures a lot better than a 601. I’m sure he wouldn’t like our PCM 44.1, which incorporates the Philips “Crown Select” D/A converter and 4x oversampling.

Mr. Mitchell must love being bossed around by home appliances. The 601 won’t copy CDs digitally—if you try, a bright red COPY PROHIBIT light flashes at you. This is even more restrictive than the half-baked SCMS system currently being inflicted on Americans (note: the 601’s copy prohibition circuitry can be “fixed” with a resistor, and if you call me at Isosonics I’ll tell you how).

Mr. Mitchell must love the aliases, phase distortion, and nonlinearity introduced by the 601’s non-oversampling brickwall A/D conversion section. I’m sure he’d hate the 64x oversampling, phase-linear, 16-bit linear A/D conversion of Isosonics’s AD 44.1.

Mr. Mitchell must love not being able to make tapes at the 6/8-hour speed where the 601’s error correction wimps out. He also must love having to buy a Beta VCR with a “PCM” switch that turns off the dropout compensation, which fools the 601’s error-correction algorithm. He’d hate the V-DAT format adhered to by the PCM 44.1 since it was designed to work properly with $150 VHS VCRs at the slowest speed. He’d probably also hate the new 10-hour VHS tapes coming out next year.

Mr. Mitchell must love being the only guy on the block to own an SVHS recorder. He praises JVC’s new 48kHz digital audio on SVHS tape standard. He must not like the idea of copying CDs digitally since the sampling rates are incompatible. He must like shelling out for expensive SVHS tape. Most consumers are happy with VHS Hi-Fi, despite its 40dB S/N ratio papered over with a cheap compander that disfigures classical music. JVC’s addition of digital audio isn’t going to save SVHS, which has performed dismally over two years in the American market. SVHS is a loser because it has too much bandwidth for its luminance noise (ie, they made it sharper so you can see more of the noise—it might look pretty good if they reduced the noise).

Mr. Mitchell must love being part of an America incapable of doing anything but waiting for the latest Japanese widget. I’m used to people ignoring our PCM 44.1 in favor of a new toy from Japan, but having it ignored in an article on PCM recording in favor of off-the-market, out-of-warranty toys that exhibit gross distortion is too much to bear. Mr. Mitchell should keep in mind that all the interesting problems in digital audio recording were solved at Bell Labs and MIT. All the clever optical engineering

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in the CD system was done by Philips in Holland. All the helically scanned tape innovations that made DAT possible were developed by Ampex in California. Busy unpacking his latest package from Osaka, Mr. Mitchell may not have noticed how dull the world of consumer electronics has become ever since the Japanese cartel took over.

Philip Greenspun

Isosonics Corporation, Cambridge, MA

Tice & Audio Express

Editor:

I am writing you for clarification of *Stereophile*’s “Reprint Policy” as it pertains to quoting from *Stereophile*’s equipment reviews. The particular case is an ad for the Noise Trapper manufactured by Audio Express. The ad appeared on p.224 of the June 1990 issue.

In this ad they use a quote from the Tice Power Block review which was published in April 1990. To my knowledge, I cannot recall any time when a manufacturer was permitted to use quotes from a competing manufacturer’s review. Furthermore, the quote used was taken out of context in such a way as to alter its meaning. The quote as it appears in the Audio Express ad reads: “I did hear a significant improvement with the Audio Express unit . . .”

The actual complete sentence reads: “I did hear a significant improvement with the Audio Express unit over the raw AC outlets, but it did not come close to the sonic transformation rendered by the Tice units.” The quote takes on a very different meaning when you get to see the rest of the sentence!

If you glanced at the ad without giving it a great amount of thought, it appears that the Audio Express unit has had a review by Robert Harley in the April 1990 issue. I am quite sure the people at Audio Express are not intentionally trying to mislead the readership. When we asked and received reprint permission from *Stereophile*, we had thought about removing the name Noise Trapper from our Power Block review reprints as we did not wish to give free advertising to another company. We were told, “Under no circumstances can we alter or change any part of the review.” How is it possible that Tice was not allowed to change or alter any part of the review while another company is permitted to quote from the Power Block review, leaving out the most important part of the sentence and our name? I find it hard to believe that this is part of *Stereophile*’s policy. I have always found the staff of *Stereophile* magazine to be completely aboveboard, straightforward, and honest, and we at Tice Audio appreciate that.

I feel very strongly that we as manufacturers should be innovative enough to have our products ride on their own merits, and not on the coattails of other products. In the same ad, the phrase “Specifically designed for use in audio systems” appears. This suggests that the Noise Trapper was designed for audio. Funny, isn’t it; the same phrase appears in Tice Audio’s Power Block advertising and literature. We can make that statement because we have spent two years of research time to find out what parameters were really important regarding AC power and audio equipment. I spoke with Gerard and Mark at Audio Express on two different occasions, asking a very simple question: “What have you done to your transformer that makes it specifically designed for audio applications?”

Unfortunately, I never did get an answer to that question!

This letter is not meant to be an attack on Audio Express. It is a plea for ethical and honest behavior for the High-End Audio Industry. Let us not sink to such a low level that consumers must question and verify everything they read. As manufacturers and distributors of high-end equipment, we have a responsibility to the consumer to be accurate and not misleading in what we say.

George R. Tice
Tice Audio Products

Regarding Audio Express’ use of the quote from the Harley Tice review, we too were bothered by it as it appeared in the June issue. We insisted that in subsequent issues, the quote be worded as follows: “I did hear a significant improvement with the Audio Express unit over the raw AC outlets.” I felt that this wording reflected the truth of Robert Harley’s experience with the Noise Trapper. Regarding the ethics of my allowing Audio Express to use this quote, Bob Harley did audition their unit and the quote, even though it was taken from a review of a competing product, did reflect his true opinion. I felt that, cheeky as it might be, it did constitute fair usage.

Stereophile has two basic rules for manufacturers who would like to quote from the magazine’s pages in their advertising: one, that no quote be used without permission; and two, that the request for permission be submit-
### Amplifiers

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<td>Price</td>
<td>$1095</td>
<td>$2650</td>
<td>$3300</td>
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### Preamplifiers

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**Stereophile, October 1990**
ted in writing, showing the exact wording proposed and the context in which it would appear. If Larry Archibald and I are happy that the proposed usage is true to the quoted author's published opinion, then we give the company permission to use that quote. —JA

CD Stoplight

Editor:

It's unfortunate for your readers that green markers and Mitsubishi UniPosca markers have been used to judge the performance of CD Stoplight. Green felt-tip markers attack the plastic, never dry, and do not sound or measure as good as CD Stoplight. The Mitsubishi marker is not the same paint as CD Stoplight and it also will not adhere to plastic as well. We do like the Mitsubishi package, however, and during development we tried to have our paint put in it, but they wouldn't allow it.

CD Stoplight was developed with the thought in mind that CDs could last a hundred years or more, a clear possibility if the plastic doesn't fog or craze (tiny cracks) and the aluminum doesn't oxidize. We carefully selected a formula that would not jeopardize the possibility of "perfect sound forever," even if we disagree with the concept that it is "perfect" sound. Properly applied (our instructions are explicit), CD Stoplight is a tough coating that will not come off in normal use or harm the CD's chance of lasting a lifetime.

We agree with the observations of many people about the sonic and optical improvements of various polishes or treatments to the shiny side of the disc; however, we do not use any polishes on the playing surface of our personal discs because of the fine scratches created and because the effects of aging are not known (they flunk our intuitive 100-year test). In fact, we won't allow anything except water and mild detergent to touch the playing surface, if at all possible.

We have noticed that the polishes we've tested have more audible effect if the disc is treated first with CD Stoplight. It is important to always apply CD Stoplight first if you want to use it with a polish, because most of the polishes interfere with the ability of the paint to adhere to the plastic.

This brings us to our recommended method of cleaning your CD regardless of whether you use CD Stoplight or not. Our continuing testing has shown that CD Stoplight adheres better and the CD sounds better if the disc is washed first. Excessive mold release is more variable and more prevalent than we originally thought. We suggest that the reader: 1) Wash the disc in a solution of Dawn Dishwashing detergent about four times stronger than you would use for dishes, 2) rinse with clean (preferably filtered) water and try to use running water to "sheet" the water droplets off the playing side, 3) place the disc label-side down on soft, lint-free paper towels (we use Chemtronics Opticwipes, a clean-room optical wipe instead of paper towels), 4) carefully blot the playing side dry if there are any water droplets on the playing surface, 5) finish drying and warm the disc with a lamp (we use a dish rack that does not touch the playing side of the disc), 6) apply CD Stoplight to the warm disc, 7) dry 5 minutes near a lamp, and 8) wait 24 hours if you wish to apply a polish or other treatment to the playing surface. It's easier if you batch-process your CDs four or more at a time.

We normally do not recommend that the center hole be painted because the excessive pressure of the jewel-box fingers might remove some of the paint, not because of a problem with players. If you wash the CD first, and the CD center hole has a rough surface like most PolyGram discs, you might experiment with painting it. It does improve the sound.

Customers have had extraordinarily few problems with CD Stoplight. It may not adhere as well because of cold temperatures (ideally, the disc, CD Stoplight, and the air should be above 80°F, or 27°C, during application), excessive mold release, oil from handling, or a polish that has been applied first. CD Stoplight has never caused a problem with a CD player, and we do not anticipate one. We also modify CD players continuously and are very familiar with the insides of players from owners who are heavy users of CD Stoplight.

CD Stoplight is a carefully developed product that has the user's long-term satisfaction as one of the goals. It won't harm CDs and produces measurable and audible improvements. We are pleased with the tremendous market acceptance, and love the improvement it makes to our music. We don't leave home without it!

William Rasnake
Clear Image Audio
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Participatory Journalocracy

This October, with the publication of yet another "Recommended Components," Stereophile reenters the seas of controversy. There are, of course, the disagreements with our judgments about equipment: Why is the B&W 801 in Class A, why the Vandersteen 2Ci in Class B, why the Adcom GFP-565 in Class B instead of A? Such controversy, however, doesn't bother me; I'm comfortable with the correctness of all our recommendations, and confident of our uttermost conscientiousness (you can be, too). Besides, our judgments are always examined and disagreed with—that's one of your most important roles (besides renewing your subscriptions!).

No, the real controversy over "Recommended Components" is: journalocracy / jor-nə-lə-krə-
/n. [MF & LL] (1990) 1: government by magazines

Hardly a month goes by in which we who bear responsibility for this magazine are not confronted by the specter of countless audiophiles flooding into dealerships, Stereophiles in hand folded open to "Recommended Components," saying, "I want to buy this, this, and this." We're flattered, but such a result is not our intention.

Listening to music is a personal experience. Although absolute fidelity in sound reproduction would present all music in an equally sympathetic manner to an infinitely wide audience, the components, systems, and homes we work with—not to mention our varying personal tastes—make it imperative that you pursue superb sound in your home with intelligence, a significant amount of trust in your own hearing and judgment, and just plain hard work. Not just with "Recommended Components."

Still, take a second glance at the first word of the title to this piece: participatory. The people at Stereophile yearn for your opinions and experiences. For better or worse, nothing could have demonstrated this better than L'affaire d'Armor All. Hundreds, perhaps thousands, of readers tried Armor All on their CDs, and many, many of you wrote in to testify, ecstasize, yawn, and, latterly, bemoan. Although I'd be the first to urge caution in any such experiments, I can only applaud your willingness to join our search (such willingness may now become somewhat damped). In the same spirit, Stereophile lays its innermost abilities in the recording studio on the line with LPs and CDs in which our readers, to the best of our abilities, join us at the recording venue.

Just today I was struck by another opportunity. Robert Harley, in this month's "As We See It," announces at length the techniques and virtues of cryogenic CD freezing. Why not make the Stereophile Test CD available in both frozen and unfrozen versions? A fast phone call to Randy Patton (of Museatex, in Agoura Hills, CA) confirmed that such a project was not only feasible but desirable (the promotional advantage of a thousand Stereophile witnesses did not escape the marketing mind of Mr. Patton). My projected price for a cryogenically frozen Test CD is $8.95, plus our standard $2 shipping and handling. (Our cost to freeze the CDs will undoubtedly be less than $2; the freight, handling, and customs to and from Canada may well turn out to be much more — this price is good until our next issue!) A thousand CDs will initially be produced, more if demand exists. You decide if the difference can be heard, without risking an irreplaceable CD. If your thumbs go up, we'll launch a further experiment using Stereophile's Poem CD. Send money and address to CD Freeze, PO. Box 5529, Santa Fe, NM 87502-5529.

"The Final Word" is rarely more true to its title than in the biographical note I append this month: On August 3, my dear father of almost 45 years died at the age of 83 and one week. He had been diagnosed with colon cancer (migrated to his liver) back in 1988, but was granted nearly two years of reprieve through chemotherapy treatment. His last six months were increasingly difficult, but I'm happy and proud to say that his spirit and dignity remained even through the evening before his death. Henry Kimball Archibald ("Kim") was as great a man as I've known, and had a very large influence on me (and on Stereophile)—he loved and acted with great intensity, and I will miss him very much. To those members of the industry and others who have written letters of sympathy, thank you so much.

—Larry Archibald

Stereophile, October 1990
LISTEN UP A BLUE STREAK

AudioQuest speaker cables will make you think you’re hearing all your music for the first time.

AudioQuest F-14 uses four solid conductors in a practical and inexpensive configuration. Strand interaction is eliminated, skin-effect and resistance are kept to reasonable levels, the performance is glorious and the price is practically free.

AudioQuest Cobalt uses Hyperlitz conductors. This patent pending design virtually eliminates magnetic and electrical interaction between strands while allowing for a large cross sectional area (AWG) with no skin-effect induced distortion. Best of all, every strand has identical geometry and electrical characteristics so that no discontinuity is introduced to the music signal.

These two blue cables and all the AudioQuest designs sound much more dynamic, dimensional and focused than the competition’s. The midrange and highs are sweeter, more extended and less “confused” sounding, while the bass is tighter and better defined. All the AudioQuest cables (speaker, interconnect and video) use very cost effective designs which give you an absolutely incredible improvement at a minimal cost.

The proof is in the listening — please listen for yourself. When you do you’ll replace your current cables with AudioQuest cables and rediscover your entire music collection.

Call today for the AudioQuest dealer nearest you.
If we wanted to make an Onkyo CD player as good as our competition, it wouldn’t be too hard.

We’d have to remove our isolated transformer with its three independent power supplies, turning musical peaks into musical mounds.

Onkyo’s proprietary Accubit calibration circuit would have to go. Which means there’d be no depth or dimension to the music. Carnegie Hall would sound like Carnegie’s closet.

Removing Onkyo’s fiber optic Opto-Coupling modules would mix in a little harsh digital noise for “grate audio”.

Replacing our aluminum die cast tray with a plastic version would be required for a faster wear, tear, it’s-due-for-repair syndrome.

Now, we could do all these things to an Onkyo CD player. But we won’t.

Because at Onkyo, our CD players are built to be better. And that’s a difference you can hear—and see.