Six Cartridges, One a World-Beater From Sumiko!
The Counterpoint SA-4 Output Transformerless Tube Amplifier
Audio Research Takes on JGH in His Own Backyard
Home Brew Science: Two Readers Compare Analog and CD

Record Reviews!
Wingate
Not for beginners.

The discriminating sensibilities of the true audiophile are developed gradually as an acquired taste. Naturally, then, we realize that the Wingate 2000A is an extraordinary feat of engineering that far exceeds the understanding or appreciation of the novice. Instead we suggest this incomparable Pure Class A amplifier only for the audio connoisseur whose trained ear will recognize absolute purity of sound.

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100 w/ch dual mono power MOSFET Pure Class A amplifier with zero-negative feedback design for unprecedented signal transparency and resolution.
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A Perfect *Stereophile*?

Well, hardly, but you should know that you hold the first-ever issue of *Stereophile* printed in what's known in the trade as perfect-bound format—with a square-backed spine. It only took 24 years (I'll admit others have done it faster), but I'm proud that we're there.

We're even taking arms against our sea of troubles—typos! Though I doubt success will happen overnight, we have installed an entire extra step in our editing, copy-editing, and proof-reading process, which we hope will virtually eliminate typos. I'm sure you'll let me know.

*Item of Interest:* Certain high-end manufacturers have decided to end the tyranny of the high-end press by presenting their side of questions where they feel wronged. The name of this publication, which makes it sound like you'd see it at supermarket checkout stands, is *The Informer.* It's being funded and put out by David Fletcher of Sumiko and Robert Becker of Sota; write for your copy from *The Informer,* P.O. Box 7075, Berkeley, CA 94707. *Stereophile* supports vigorous discussion of issues, both within and without our pages.

*Item of (probably) Greater Interest:* After years of low subscription prices, *Stereophile* is reluctantly having to increase its basic subscription rate from $18 to $24. Are we still a good deal? In the three years since we went to $18 (down from $20), our number of pages have gone from 72 to 164, our reviews have gone from roughly eight products per issue to roughly twenty, and we're now perfect-bound—and hoping to be typo-free! Still, only you can decide if we're a good deal.

Watch your mail. Current subscribers will be given a chance to renew their subscriptions for up to three years at the old rate. And, in line with our old policies, if we increase our frequency you don't have to pay more—i.e., you renew for a period of time, not a number of issues. I'm looking forward to you being with us a long time.
Although inclined to mood swings bordering on the manic-depressive, I am generally a very patient, tolerant person, willing to accept and overlook the foibles of those less perfect than myself. But even my incredible equanimity has its limits, beyond which the milk of my human kindness curdles, becoming as lumpy as last month's yogurt.

Perhaps I have just grown tired of certain kinds of mindless idiocy. Perhaps I am, in fact, growing shorter in tolerance as I grow longer-sighted. But if, perchance, you should engage me in casual conversation or intense technical or philosophical discourse, or happen to be a manufacturer planning to send me your latest Earthshaking Breakthrough Product, here are some of the things that cause me to see red:

**Things that Don't Fit**

This category includes all unmatable items: undersized RCA jacks, oversized speaker-cable lugs, misspaced "dual" banana jacks, off-sized phono cartridge pins, oversized platter spindles, undersized record holes, and amplifier top covers whose screws won't screw back in once they're removed. And let's not forget record inner sleeves that won't release the disc unless you slit them open or grab the edge of the record with pliers.

**Self-Righteous Audiophiles Who Never Go to Concerts**

Frequently the ones who make the biggest fuss about "realism" and "accuracy," these know-nothings cause my red vision to fluoresce! If live, unamplified music is
The New Generation of Tube/MOSFET Technology

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Telephone (619) 453-9090  Telex 284902 CPT UR
but a vague, amorphous recollection wafting around in your subconscious, you are no more qualified to judge the fidelity of reproduced sound than I am to judge your moral fiber. Tell me what “sounds good to you,” but don’t try to tell me what’s accurate. You don’t know from nothin’.

Musical Fundamentalists
People who feel that all music since Guido of Arezzo is brash, blatant, overblown, and tasteless have no need for Infinity RS-1B loudspeakers and 200-watt Krell power amplifiers. If you’re not into Grand Opera, Mahler, or John or Ralph Vaughan Williams, don’t ask me what’s the best amplifier or preamp or speakers or cartridge or turntable. Or arm. Buy a Fisher stereo.

Meter Worshippers
These folks dogmatically assert that Product A sounds better than Product B because its low-end 3-db-down point is 2 Hz greater, yet remain serenely oblivious to any horrific distortion they can’t attach a number to.

Many of them write for Stereo Review.

Rock Record Jacket Notes, The Total Absence Thereof
If I enjoy the music, I want to know something about it, the composers, or the performers. Most rock jackets are clearly aimed at illiterates: gaudy pictures, maybe the nicknames of the performers spelled out fonetically, and nothing else. Nihilistic nullifidianism!

Audio Mysticism
As an agnostic, I have no more patience with those who see sound reproduction as an amalgam of auras and astral planes than I do with those who walk in front of trailer trucks assuming that, if they get splayed out like a throw rug, it was God’s will.

This category includes little black boxes—and their promoters—which restore trash sound to its original pristine state by laving it with energy drawn from the earth’s ethereal resonance.

Digital Bigots
I don’t care whether you like digital sound or not. That’s your business. But don’t try and tell me you can hear all those little bits or samples or error corrections until it has been proven to me that those things are actually audible, and that the imperfections we hear are not—as I remain convinced they are—just deficient converters and bad analog circuitry.

In fact, hand me another abstruse reason why digital can’t work at all and I’ll ignore you. I’ve heard it before.

Shrink-Fit Packing Cartons
An exclusive province of loudspeaker manufacturers, these boxes are such a tight fit that you have to turn them upside down and shake them to get the speakers out. (Try that with a pair of 150-pounders!). The alternative is to slit open one corner and peel off the cardboard like old linoleum. I have visions of a 200-pound packing person sitting on top of the speaker to get it into the box.

Repacking the speaker takes half a roll of sealing tape, and the manufacturer complains because the box “fell apart” on its return trip (heh, heh, heh!).

Secret Fuses
The whole point of a fuse is that you can replace it if it blows. (If it blows once, the stars were not propitious. If it blows again, it’s trying to tell you something.) What, then, is the point of putting fuses in dark recesses inside an amplifier, while marking the outside “No User-Serviceable Parts Inside”? This, by the way, is always done with amplifiers whose cover screws won’t line up with the chassis holes.

This short list is but a sampler. I have one additional peev: submission of products specifically for me to review that, in their basic design elements, perfectly represent what I constantly rail against in these pages. Send it to someone else, for Pete’s sake!

There are many more things that irk, irritate, or infuriate me on occasion, but I can take them in stride—between mood swings, that is. Those listed above are the prime movers, the cream of the crop, the takers of the cake; the waving red flags.
A New Era

After years of research by Thorens engineers, and years of anticipation by audiophiles, Thorens introduces the 300 Series turntables.

The 300 Series turntables combine the classic Thorens design and performance features with innovative new engineering.

In celebration of the new product series, Thorens has produced a stunning limited edition model, The Phantasie. Based on the TD 320, the Phantasie has a chassis that is carved from a 40 millimeter thick block of solid plexiglas. The result is an incredibly rigid, totally non-resonant chassis. When combined with the 300 series' revolutionary, full isolation, three-point leaf spring suspension system, it provides an ideal environment for the superb Thorens platter drive system and tonearm.

Whether you choose the unparalleled beauty and performance of the Phantasie, or one of the standard 300 Series units, you'll get the quality, reliability and pride of ownership that has come to typify the name, Thorens.
LETTERS

We regret that time does not permit us to 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.

Voiding The Warranty
Editor:
We at Infinity are writing to you with regard to your article in the February 1986 issue of Stereophile entitled “The Wire Survey: Update 1,” specifically the comments relating to Infinity speakers. We would like to remind you and your readers that any modification or adjustment to any Infinity product which is not factory authorized will render the product’s warranty null and void.

Cary L. Christie
Infinity Systems
Chatsworth, CA
This is particularly important given JGH’s enthusiasm for soldering the wire connectors to the driver terminals on the RS-1B, detailed in “A Visit To, And From, Audio Research,” in this issue.

Vertical Elimination
Editor:
How can I eliminate all vertical information from a phono signal during record playback? I have many prized but old and worn mono recordings that I would like to “clean up.” I have noticed that, when listening to these records through headphones, the “pure” mono signal is in the center, while all the wear and tear is in the left or right channel. I think what I need is a gadget that performs the opposite function of the “Thompson Vocal Eliminator” (subtracting the center mono information for people who like to sing along.)

While I take awesome care of my discs now, state-of-the-art equipment was still a far-away goal when I purchased my Richard Purvis Organ Recital at Grace Cathedral (HIFI Record R-704), E. Power Biggs Bach's Royal Instrument, Vol. 3 (Columbia ML 4500), and others which I will always cherish. I would like to hear these in a cleaner condition for a change. Any advice?

Thomas E. Dimock
Ventura, CA

Combining the L and R signal channels will eliminate all signal except the mono A + B.

Some preamps have a switch provision for doing this (“A + B” or “Mono.”) If yours doesn’t, use two Y-adaptors and a male-to-male coupler between the preamps and power amps to do the same thing (see diagram, below). To restore stereo operation, merely disconnect the coupling between the channels.

If your preamp has non-isolated, paired outputs for each channel, the simplest way to get A + B summing is by inserting an inter-
Occasionally genuine wisdom about loudspeaker design emerges from the yearly torrent of "speaker-speak." A general consensus regarding the goal of loudspeaker design has finally been achieved: to help recreate the musical sound stage without adding coloration or distortion.

Celestion has been pursuing this same objective for over 60 years. We refine the essential elements in our speakers, drivers and enclosures, so they perform truthfully—nothing more, nothing less. To accomplish this, we rely on exclusive technology like the computerized interferometry mapping system that visually displays the behavior problems of typical tweeters and woofers.

We also employ the most highly evolved of all audio test instruments—educated ears. The end result is sound stage imaging which accurately conveys the dimension of the concert hall.

Undeterred by the steady flow of self-serving buzz words and conflicting absolutes, Celestion continues its pursuit of the music with the new SL 6S. Like other Celestion loudspeakers, its lifelike performance shows that technology is only effective when it serves the demands of the music.

Celestion's computerized laser interferometry mapping system exposes imperfections in driver performances so we can eliminate them.

Our award-winning proprietary one-piece tweeter dome is designed to perform without physical, hence acoustical distortions.

Refinements incorporated in the new SL 6S include a lighter, more efficient aluminum tweeter, a redesigned woofer surround and a new ultra-rigid bracing system for the low-mass enclosure.
connect between the L and R Output 2 jacks.

AR/Grado Hum
Editor:
A letter to the editor in your Vol. 9 No. 1 issue caught my attention. It concerned a hum problem associated with the AR turntable and a Grado F3E cartridge. The writer stated that the hum occurs only when the platter is rotating and the cartridge is over the platter and an inch in from the record's edge.

Your recommendation was to purchase a new cartridge, as Grados are renowned for their lack of shielding and consequential hum problems.

The problem I have with this suggestion is that I, too, experience the exact same symptoms, but with a Shure V15-VMR cartridge! Aren't Shure cartridges shielded rather well? Is it time to send in my AR for a new motor? Any suggestions?

Chris Coury

This is a new one to us, and we're not sure what the solution might be. No one else has ever reported this problem to us.

Yes, Shures supposedly are well shielded, but a strong enough hum field will penetrate any shielding.

If you are certain the hum is coming from the turntable and not a nearby power transformer (if it's the 'table, the hum will stop when the 'table is turned off), the only thing you can do is trade in the cartridge or turntable for a different brand which you have first determined to be compatible with what you didn't trade in.

AR Suspension Adjustment
Editor:
I bought an AR turntable, and in setting it up devised a way of leveling the suspension that is easier and less complicated than the method mentioned in your review.

Place the turntable on an expandable dining room table, with the expansion leaves removed and the table halves pulled apart so the gap is just wide enough to support the edges of the turntable. The AR can then be exactly leveled by using cardboard shims. This makes a very stable work plat-

form, and the turntable mechanism is accessible above and below, for subchassis leveling and belt adjustments.

Kenneth Beers Jr.

The Fifth Way
Editor:
I noticed your footnote on p. 5 of Vol. 7, No. 2 concerning the use of the so-called 5-way plug. You indicated four uses for the plug: spade lug, looped wire, straight wire, and banana plug.

I've wondered the same thing for the past 35 years: Why is it called a five-way plug? I could not find a fifth way.

Walter L. Marple

The fifth type of connection used to be via so-called pin plugs, which terminated all headphones until the "phone plug" became the standard headphone termination in the 1950s.

Mirrored Imaging
Editor:
On a recent visit to a Bay Area audio store, I got into a friendly argument with a salesman that was never resolved. Perhaps you can.

While listening to one pair of speakers, I noticed that the sound sources seemed to be reversed, left for right. The salesman said this could not be, as reversed channels would lead to fouled-up imaging. I disagreed, contending that things would be
Compact disc clarity. The ultimate expression.

The purest, most accurate digital audio possible in a compact disc player. Excellence that combines the finest features. Performance features like 16-bit processing with oversampling, separate digital and analog filtering systems, and Longlife™ 3-beam laser tracking. Convenience features like wireless remote control. Just sit back and experience the incredible transparency and dynamic range only flawless digital design can offer.

The D5000

Only a few for the few. At a few select dealers.

SHURE
Switched left to right but, otherwise, the imaging would be fine. He rebutted with a pen-and-paper analogy.

Two points, representing left and right channels, were drawn, with a generic instrument drawn slightly to the left of the center. The paper was then torn in half, between the channels, and put back together with the torn edges on the outsides, such that our generic instrument was now floating offset to the right. I suggested that the more appropriate analogy would be to redo his drawing on transparent paper, and then simply turn the thing over. The instrument would then be slightly to the right of center.

A second salesman entered the fray, but was apparently unimpressed with either argument, offering only that reversing channels fouls up imaging—but he didn't know how or why. I conceded only that a well-miked guitar might confuse a guitarist, since sliding fingers on frets would occur to the left of sound emerging from the sound hole, and so on. Unfamiliar material, I said, should sound fine.

Who is right?

Colin Hamilton Sacks

You are

Reversing stereo channels merely reverses lefts for rights, and if you are unfamiliar with the way the sound sources ought to be ranged across the stage, you will hear nothing whatsoever amiss.

Imaging is “foiled” by channel reversal only when one knows the directional cues to be wrong, then the subconscious cannot “put the pieces together” to one’s conscious satisfaction.

The Organ Symphony

Editor:

While in the French Pavilion at Disney’s Epcot Center, I watched their film “Impressions de France.” Portions of the film score contained some outstanding music which I later discovered to be sections from the 4th movement of the Symphony No. 3 by Camille Saint-Saens (You can get a listing of the music in the film’s musical score upon...
request from a pavilion employee.)

Can you or someone on Stereophile’s staff recommend the best recording of this music, and a possible source for that recording?

Hal Blackmore

There’s a best recording of this with a tepid performance (Telarc 10051), and two stunning performances (RCA LSC-2341 and EMI 4Q7W0-404). The RCA is a better performance, with better sound than the EMI, but it’s no longer available unless you can find a used or remaindered copy.

Measurements

Editor:
Since I began reading Stereophile and other so-called “underground” audio publications, I have come across the contention that the measurements used in such magazines as Stereo Review are almost useless in helping one determine why products within a given component category sound different, let alone better or worse.

My own limited experience bears this out, but it begs the question: Are there any objective measurements that you do feel are useful in helping one compare components? What specs, if any, would you like to see Stereo Review and others quote on a regular basis?

Robert Clark

Here are a few:

• Distortion measurements which show the distribution and relative strengths of every spurious harmonic and sum-and-difference signal.
• Phase-shift and coherence measurements.
• Tone burst and pulse (TDS) tests.
• Horizontal and vertical dispersion plots at different frequencies for loudspeakers.
• Amplifier current capability, both steady state and short-term.
• Preamplifier HF output capability and frequency response into a capacitive load.
• Loudspeaker frequency response in a real room (not anechoically).
• Turntable breakthrough (feedback susceptibility).

Since Stereo Review appears to have a vested interest in concealing the real differences among the products they test, we doubt that they would be interested in using measurements that might distinguish sheep from goats.

Flat-Earther

Editor:

In a recent Stereo Review column, Larry Klein states that the most important requirement of speaker cable is that the total wire resistance should be kept at 0.2 ohm. Assuming that cable flexibility problems are manageable, why then not use twisted pairs of No. 10 or No. 12 solid copper or aluminum wire for speaker leads? They can easily achieve this resistance value at one-tenth the cost of using expensive multi-filament special speaker cables.

Since you publish many interesting pieces about speaker cable, your views on this might be of wide reader interest. Keep up the good work!

David P. Herron

Klein is what we at Stereophile consider to be the audio equivalent of a flat-earther: one who, despite overwhelming evidence, refuses to believe.

Yes, low DC resistance is important, but it is only one important attribute of a speaker cable. Also important, in terms of sonic performance, are such things as inductance, dielectric (insulation) characteristics, multi-strand conductor size and configuration, intra-conductor capacitance, and characteristic impedance.

Unfortunately, no one can explain to everyone else’s satisfaction why each of these things has an effect (that’s why we have high-end audio), which is why people like Klein refuse to believe they have an effect.

Asset and Marantz

Editor:

Stereophile is a genuine asset to one seeking good reproduced sound within or without a budget. I like the way you mitigate or excuse aesthetic neuroses with humor.

I was pleased to read a short, favorable note in a recent issue about the Marantz Nine. I disagree that the Marantz Nine is a particularly good deal, but I think it was on
THE CARVER CAR AMPLIFIER introduces Magnetic Field Amplifier technology to automotive high fidelity. Finally, the traditional weak link between car stereo decks and modern speaker design has been replaced with Carver technology. Into 1/10th of a cubic foot, Bob Carver has engineered a complete 120 watts RMS per channel amplification system with the fidelity, accuracy and musicality demanded by the most critical reviewers and audiophiles.

ESSENTIAL POWER. Even before the exciting advent of new Compact Disc players, an abundance of power has been necessary to reproduce, without distortion, the frequency and dynamic range produced by modern decks. Unfortunately, conventional amplifier technology is particularly unsuited to delivering this needed power to the specialized car interior environment. Like their home stereo counterparts, traditional car designs produce a constant high voltage level at all times, irrespective of the demands of the ever-changing audio signal – even those times when there is no audio signal at all! Because automotive amplifiers must, obviously, derive their power from the host vehicle, such an approach results in substantial drain to delicately balanced automobile electrical systems.

The Carver Magnetic Field Car Amplifier is signal response, highly efficient, it produces only the exact amount of power needed to deliver each musical impulse with complete accuracy and fidelity. Thus, the Carver Car Amplifier not only reduces overall long-term power demands, but produces the large amount of power necessary for reproduction of music of realistic listening levels without the need for over sizing power supply components. Important considerations in the minuscule spaces which quality car design allocates to add-on electronics.

INTELLIGENT POWER. A hallmark of all Carver amplifiers is the careful integration of sophisticated speaker and amplifier protection circuits. The Carver Car Amplifier is no exception. Speakers are protected with a DC offset internal fault protection design which turns off the power supply at first hint of overload. An overcurrent detector mutes audio within microseconds of a short circuit, as does an output short circuit monitoring circuit. Together, these three circuits eliminate the potential need to replace fuses, revisit your audio system installer, or worse yet, replace expensive speakers due to a moment’s indiscretion with your deck’s volume control.

ASSIGNABLE POWER. Integrated bi-amplification and bridging circuits, along with The Carver Car Amplifier’s compact configuration make it ideal for multiple-amplifier installations. The built-in 18dB/octave electronic crossover allows use of two amplifiers in a pure bi-amplification mode without addition of extra electronics. Or, at the touch of a button, one Carver Car Amplifier can become a mono amplifier for subwoofers while the other Carver Amplifier handles full range. Or, for astonishing dynamic and frequency response, two Carver Amplifiers may be operated in mono mode into 8 ohms for a 240 watt per channel car system which will truly do justice to digital without taxing your car’s electrical generation system.

INNOVATIVE POWER. Car 1/10th of a cubic foot of space hold yet more innovations? Yes. Carver has addressed the ongoing problem of head-end/car amplifier level matching. Output of current car decks varies widely from brand to brand and model to model. The result can be a less than perfect match. The Carver Car Amplifier incorporates circuitry which compensates for variations in head-end output, reducing noise and optimizing signal-to-noise ratio. In addition, Carver has added a subsonic filter which removes inaudible power-robbing infrasonics before they can tax the amplifier and speakers. Finally, a delayed turn-on circuit activates the Carver Car Amplifier after your head-end unit has powered up, to eliminate starting pops and thumps.

ACURATE POWER. It goes almost without saying that a product Bob Carver designs for the road carries the same superb electronic specifications that his home audio products are known for.

The Carver Car Amplifier is flat from 20Hz to 20kHz, down -3dB at 18Hz and 30kHz. Not coincidently, the usual specifications given for Compact Discs. A signal-to-noise ratio of over 100dB means that, in even the most quiet luxury sedan, you will never be annoyed by hiss. The other specifications are equally as impeccable. You may peruse them in our literature or in independent reviews soon to appear.

ACURABLE POWER. The remarkable Carver Car Amplifier is currently available for audition at Carver dealers across the country.

It is worth the journey. Whether you have an car system in need of the sonic excitement possible with abundant power, or are in search of the perfect complement to a new high-performance automobile, you owe it to yourself to experience the logical extension of Carver technology – The Carver Car Amplifier M-240.

Power Output Stereo Mode (continuous RMS output per channel, both channels driven, at 12.6V/1000 input, 120 ohm into 4 Ohm, 20 Hz to 20kHz with no more than 0.1% THD)

Power Output Bridged Mono Mode (Reference to 12.6V/1000 input, 340W into 4 Ohm, 20 Hz to 20kHz with no more than 1% THD)

Input Sensitivity: Variable 750mV to 4V

Signal to Noise Ratio: (Reference to 120W A-weighted into 4 ohms)

Gainable -90 to +3.3

Crossover: 15Hz, 18dB/octave

Weight: 4.7 lb.

The Carver Car Amplifier

Carver Corporation, P.O. Box 1237, Lynnwood, WA 98036
Distributed in Canada by Evolution Audio
The Hi-Performance Indoor FM Antenna

PARSEC 7403-II

enhances reception with quality components

- omnidirectional
- easy to install
- UL UL listed power supply
- eliminates multipath interference
- amplifies hidden, weak signals

the PARSEC 7403-II is a second generation, high technology, universal omnidirectional antenna. It uses an advanced low noise, high gain modular amplifier to capture and increase weak signals and provides proper levels for good reception.
the right track. Though years of attention to tube circuits have certainly borne results, I believe older designs achieve most of what can be achieved. I do not believe that a McIntosh 60 needs to be in a museum. However, these older products, although capable of exemplary sound quality, rarely achieve it as bought. The internal components have aged, like most of us, for the worse.

Fortunately the offending components can be replaced without undue difficulty, though this sort of parts-swapping is probably best left to one who has passed slightly beyond Heathkit assembly techniques. With respect to signal-carrying capacitors and resistors, additional benefit comes from the advances that have been made in device construction for audio applications, including some of those that advertise in *Stereophile*.

With modest expenditure for a used, working amplifier or preamp, and a roughly equal expenditure for new, superior quality parts and labor to install them, sound can be obtained from twenty- and even thirty-year-old designs that is at least of audiophile quality, if not in the first or second rank of the current art. I have done upgrades like this on several occasions, and would challenge you to do so with a Marantz Eight, McIntosh 225, or Dynaco Stereo 70, and just listen to it. Sometimes I listen to my old (upgraded) Mac A-116, and wonder what the enormous volume of research and development in audio have really achieved since 1954.

Robert C. Evans

*We erred. The Marantz amplifier in question was an Eight B, not a Nine. And, No, it had not been upgraded. It had all its original parts.*

**The Klipsch Heresy**

Editor:

As an unabashed owner of a pair of Klipsch Heresy speakers, I found JGH's comments in "Directional Questions" (Vol. 9, No. 1) intriguing, Apropos, I believe, to the discussion of the "Gestalt alarm" is the statement that "musicians who listen to records are increasingly (according to our mail) choosing Klipschorns over the products of high-end manufacturers." For the duration of my subscription to *Stereophile*, Klipsch has seemed to be a "heretical" word, as their speakers have merited no notice, let alone a single positive review. I had hopes, back in Vol 7, No. 1, after reading JGH's "Professional Monitors" (p. 48), that you would at least give some (re)consideration to the Klipsch. After all, you did have to reveal that Doug Sax uses horn-loaded midrange and tweeters (heaven forbid!) on his custom studio monitor system. You even went so far as to quote Sax as saying "Live music is loud. A player wants to be able to walk out of the studio into the control room and hear it the way he just heard it ..." (emphasis mine). So, is this letter to be suppressed also, or ignored in the hopes that horn speakers will go away? Do you have, perhaps, some particular grievance with Klipsch? In one of my back issues (Vol. 4, No. 3), the Klipschorn does make your list of "Unrecommended Components." I'd be very interested to know the how and why of that testing and evaluation. For myself, the "gestalt" of the Heresy is in another realm entirely from that of equivalently priced dynamic speakers (I didn't make dream comparisons; I know what I can afford). I'm not trying to box you in, but comment, please.

---

**JGH responds:**

I confess to having a love-hate relationship with horn speakers in general. I love what they do through the middle range, but I have yet to hear one that did not sound unbearably strident through the upper ranges. I'm not saying that all horns sound that way; just all the ones I have heard. While I certainly hold no grievance against Paul Klipsch, I disapprove of any loudspeaker which must be placed in a room corner, as corner placement produces the most irregular low end, and usually the worst stereo imaging, that it's possible to get in any given room.

I heard a pair of Klipsch Heresies in a dealer showroom a few months ago. I loved the middle range, and I hated the highs.
just a few years ago, when I started writing the Cheapskate column, there were few good-sounding turntables for under $500. The Rega Planar 3 was about it: a poor man's Linn. There was also the Thorens TD-160, which could be made to sound quite good by replacing the mat and possibly diddling with the suspension (there are those who believe the TD-160 sounds better with the foam removed from the springs; I'm not so certain).

Then the AR turntable was reborn—Edgar Villchur's classic three-point suspension 'table from the early '60s, fitted with a new arm and a more luxuriously finished cabinet. It knocked my socks off stock from the factory (as long as you got a good one—see my review in Vol. 7, No. 1), and sounded even better when I installed a Rega RB300 tonearm. That combination, with a decent cartridge, will get you very close to the performance of a Linn/Ittok for a fraction of the price.

Now AR has changed its turntable line. The EB-101, listing at $399, comes with a dedicated arm—you can't buy it armless, and it's not easy to substitute another. However, the new arm may couple more effectively to the suspension, which should improve the sound. And there's the AR Connoisseur ES-1 'table, listing at $350 without arm, $475 with. An ES-1 with a Rega RB300 arm should be an excellent combination at $550. There's also the $400 Sonographe ($550 with arm). Such choices!

I have read some comments that the Rega RB300 arm is hard to set up. I don't find it so, and I am a person who is terrified by the apparent complexity of many arms. The Rega does lack any convenient means of height adjustment—you have to use spacers where the pillar meets the armboard, and you can't unplug the phono signal wires. Also, you have to take care not to use the plastic anti-skating housing as a wrench when installing the arm; it might crack. Otherwise, the Rega is one of the easiest of all arms to install, and it's simple to use; it also seems robustly made. I love it.

If you have the dollars, the RB300 on an AR ES-1 or a Sonographe is the way to go, though, as analog front-ends go, they're not exactly Cheap. If your budget doesn't permit the separate arm and 'table route, you can opt for the AR EB-101 (which tends to be discounted), or one of the 'tables below.

The Dual CS5000

The Dual CS5000, at just $350 with arm, is Dual's top-of-the-line 'table, which should tell you something about the turntable market. At first glance, the CS5000 looks fabulous—a real wood veneer cabinet, electronic speed change, and a very interesting arm called the OPS (optimum pivot system).

The arm looks a little odd—the first thing you notice is a low-hanging counterweight. Then, as you read the manufacturer's literature, you learn that the pivot bearing is at the same height as the plane of
the record—an arrangement said to improve tracking. Four ball bearing-supported steel points keep the arm in balance, even if the 'table isn't level—even if the table is turned upside down! This could be the ideal turntable for someone who lives on a boat in San Francisco Bay.

The CS5000 is one of the most original turntables I have seen. It has electronic speed change—no removing the platter to change speed, no clunky levers. And it plays 78s! It gives you a convenient way to cue a record: you set the stylus over the lead-in grooves with cue lever down, but the arm stays automatically lifted. Then, about 8 seconds later, after you've had a chance to sit down, the arm automatically descends. Wonderful! Another bonus: the arm lifts automatically at the end of the record.

All this might seem like gimmickry if the sound were crummy—but it's excellent, considering the $350 price tag. The CS5000 is one of those rare 'tables (the AR is another) that gives you a sense of the musicians' palpable presence. The soundstage is deep, and instruments are precisely localized. All of this makes the music sound more real.

The only thing lacking with the Dual (to my ears) is a full, rich bass. There is something a bit featherweight about the sound. I also thought that the arm could have been better—the highs sounded a little fuzzy, indicating that the arm bearings may not have been done up as tight as they might be (and perhaps are on later production units—this was an early one). I suspect these sonic problems relate to the overall tonearm integrity. Face it, you're not going to get a 'table with a built-in Rega RB300 at the price the CS5000 sells for. Nor is the arm very bad; I just think it's the 'table's biggest weakness.

You can't raise or lower the tonearm pillar, but the arm tube can be raised or lowered a tiny fraction of an inch using a small setscrew; it's not very satisfactory. However, the arm comes with a very unusual headshell that has a dial on top! The dial lets you tilt the cartridge back or forward to get a precise VTA (with most cartridges). It's neat, but I would have preferred an adjustable pillar.

These are minor quibbles. The Dual looks great, sounds terrific, and is a steal for the price. The importer (Ortofon) tells me the 'table is back-ordered for months. It's worth buying, even worth waiting for.

The Thorens TD 318

The Thorens TD318, like the Dual CS5000, retails for about $350, comes from Germany, has electronic speed control, and automatic arm lift at end-of-record; they are natural head-to-head competitors. This fine 'table is a classic Thorens: it looks like it will last for ten or twenty years—very robust construction, perhaps better than the Dual.

The sound? Good, but different from the Dual, which in itself is surprising in a $350 turntable. While the Dual excels in soundstaging and imaging but appears a bit bassy, the Thorens is good (though not outstanding) in its soundstaging and imaging, and rich and full in the bass. The overall tonal balance is excellent.

I like the Thorens very much, but I like the Dual even more. The Dual sounds less congested, more immediate, more real. I tried three cartridges on each 'table: the Shure Ultra 500, the Grado FTE + 1, and the Goldring G1020, each with much the same results.

The Dual, with its detachable headshell, is a breeze to set up; the Thorens, with its fixed shell, is not. Cartridge installation, while quite precise, is a pain. You have to attach wires both to the arm and the cartridge. Why couldn't Thorens attach the wires to the arm? Still, once the cartridge is installed, the Thorens is reasonably convenient to use.

There's something else you should know about the Thorens—it is exceptionally well-isolated. You can't turn the 'table upside down, as with the Dual, but you can bang on the front of the 'table or slam down the dust cover without upsetting the stylus. The Thorens is also quite immune to footfall—better than the Dual (which itself is

---LA

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quite good, and can be adjusted).

The Thorens lacks height adjustment. You're expected to use plastic spacers in the tonearm, and virtually every cartridge will require a spacer. Anti-skate is accomplished with weights rather than with a magnet, as on both the Dual and the more costly Thorens models.

There you have it: two very different but very fine belt-drive turntables, with arms, that sell for $350. If these were $600 CD players, people would be raving about the sound. And don't eliminate the AR EB-101 from consideration.

The Goldring G1020 Cartridge

My liking for Goldring cartridges goes back a long way. The only remaining large-scale British cartridge manufacturer, Goldring has always made very sweet-sounding moving magnets. Sad to say, their cartridges have not found favor in the United States, and distributors would take the line, then drop it for lack of interest. I guess there's more money to be made with exotic Japanese moving coils.

Goldring now seems to have a distributor committed to the line: Import Audio (also importer of Rega). It's encouraging to note that Import Audio is bringing in the G1020 van den Hul moving magnet at a reasonable retail price of $95. At this price, audio snobs will automatically assume the cartridge is no good, which is fine: the Goldring G1020 is not for them anyway.

This is pure classic Goldring, with the strengths and weaknesses I have come to expect. The high end is one of the most exquisite I have ever heard: extended, but un-fatiguing in a way that moving coils seldom are. The weaknesses? There's not the greatest amount of detail, and front-to-back depth is a little lacking compared to some (mostly more expensive). And bass could be a bit stronger.

Nevertheless, this is a fine cartridge for $95. Detail is quite good for the price, and lateral imaging is excellent. Two things strike me about the Goldring: the cartridge lets you listen for hours and hours without fatigue, and is reasonably forgiving with less-than-perfect source material. Audiophiles looking for quick thrills (I can't say "Cheap" thrills) will probably not like this cartridge. Music lovers who have lots of old (and new) records probably will.

As my friend Roy Hall (Music Hall) says, "Forget hi-fi BS. Does the product give you pleasure?" Well, the Goldring G1020 gives me pleasure, and at the moment it's installed in my tonearm, even though I have several cartridges that cost much more. That's the way it is with this cartridge: I put it on and I don't want to take it off. No more cartridge reviews for the next few months while I enjoy the sound of the G1020.

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Accuphase has a heritage of producing some of the finest sounding tuners available. The T-107 tuner, the long awaited FM only version of the highly acclaimed T-106, offers a new level of performance and value which none can match.

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NEW PRODUCTS FROM BRITISH FIDELITY

Regular readers of this column will remember my praise of the British Fidelity Synthesis integrated amp—one of the finest units on the market and still a steal at its current retail price of $575. Yes, you can do better with carefully chosen separates, but I don’t think you can do better for $575. To my ears, the Synthesis sounds as good as some separate combinations that cost $1800.

Then there is the A-1 20 watt/ch Class A integrated. A little shy on power, but a wonderful-sounding unit which could be just right for those who don’t need the power and don’t mind the heat—Class A runs hot. I’m hoping British Fidelity will release a more powerful version.

The British Fidelity P-170 Power Amp

Meanwhile, there’s the British Fidelity P-170 85 watt/ch power amp that Alvin Gold raved about (Vol. 8, No. 5). I’ve had one myself going on two months now, and Alvin is right. This amp retails in the U.K. for £440, which includes 15% VAT. That’s very close to the $650 U.S. retail price, which means the importer is working on a very thin margin. So, for that matter, are the manufacturer and retailer. As you well know, British equipment is not always such a bargain by the time it gets to these shores.

Even British reviewers grudgingly admit that the U.S. leads the world in amps and preamps. Krell, Audio Research, Threshold, Counterpoint, Conrad Johnson—all these brands are as highly regarded by British audiophiles as they are by North Americans. Some brands seem to be even more popular abroad than at home—Krell, for instance. American amps have a powerful appeal: big, expensive, lotsa balls.

Balls is a quality generally in short supply when it comes to British equipment, Linn and Rega possibly excepted. Nor do they have what it takes to compete in the North American market. A few products find a niche: Quad, Creek integrateds, and, to some extent, Naim. And now British Fidelity (Musical Fidelity in the U.K.)

I’ll not waste words. The British Fidelity P-170 is the finest all-around power amp I have heard for under a kilobuck. And that includes you-know-what.

The P-170 uses MOSFETs in the output stage. Cheapskate readers will know that I’ve enjoyed most MOSFET amps I’ve auditioned, probably because they remind me of tubes. Hallelujah! Give me that old-time religion.

That’s why I freaked out over the B&K ST-140, which, in my opinion, sounded better with my Quad ESL-63s than a pair of the little Quicksilver mono amps. The B&K, at $440, continues to be my top choice in under-$500 amps. Anyone who bought one got a bargain.

But the P-170 is better yet. This does not mean you should rush out and sell your B&K—or buy the P170 instead of a B&K. First of all, the P-170 should sound better than the B&K: it costs $200 more. The differences between these two amps are very, very slight; if you like one, you’ll like the other.

Apply everything I’ve said about the B&K to the P-170: lots of depth, lots of air; a deep, wide soundstage; smooth, tubelike midrange; good but not overwhelming bass; and enough power to drive most (not all) speakers with ease. What the B&K lacks, as I’ve pointed out before, is the last iota of crystalline clarity—the edges of the music are smoothed over. This is precisely where the P-170 has the edge over the B&K: crystalline clarity. I notice it particularly on good jazz recordings—the sound is just slightly clearer and crisper, more transparent.

As with the B&K, the soundstaging ability compares favorably with much more expensive amps. However, the P-170 seems to lack the Eagle’s astonishing harmonic detail. And the bass, while good, could be tighter; it’s not as well defined as the Eagle’s, or the new Superphon’s.

I find that the P-170 has a sound very much its own, something that seems to be true of all great power amps. It’s like other MOSFET amps, but clearer and cleaner;
almost like a Class A amplifier, but not quite as sweet. More dynamic, though, unless you’re talking Krell. It’s tube-like, but a little leaner, not quite so romantic. It’s Eagle-like, but not as well controlled in the bass or as harmonically detailed.

What I am getting at, rather clumsily, is that the P-170 is a terrific amp for the money. It’s not perfect, but, for $650, what is? It is as musical as any solid-state amp I know of, and is one of the few solid-state amps which do a beautiful job of driving Quad ESL-63s. I know of nothing better for the price.

The P-170 is quite revealing of the cartridge, preamp, and cables feeding it. Your dealer can render great assistance in this regard.

If you’re on a tight budget, the B&K ST-140 will give you nearly as good sound for $200 less. The Superphon amp (100 watts/ch and $599), which I auditioned briefly, is also competitive: slightly more powerful-sounding, with tighter if not deeper bass. Whatever your choice, your selection process should definitely include an audition of the P-170.

The British Fidelity Preamp Two

Ever notice that many companies come up with a good power amp, and then a preamp generally considered not quite up to the same standard? There are countless examples of this, which is one reason I tell people that they may be better off not buying a preamp and a power amp from the same company.

In some ways, the British Fidelity Preamp Two is an excellent product. I just wish it sounded a little better, had more features, and better construction. On the other hand, if it were better it probably would cost more than $450.

I like the smooth, unfatiguing, tubelike sound—a sound that guarantees you’ll get listenable, enjoyable sound out of the P-170 power amp. (‘‘Tubelike’’ is an adjective I apply over and over to British Fidelity products.) I like the fact that it has a discrete moving-coil section of very high quality; the Superphon Revelation Basic Dual Mono (same price), which I liked so much, doesn’t have an MC section. I also like the simplicity of the design: the fewest possible parts, and simplest circuits, have the smallest chance to screw things up.

What don’t I like? There’s something a bit primitive about the way this preamp is built and finished. The volume control pot, for instance; I’d like the preamp better if the volume control knob on my sample didn’t sometimes scrape against the faceplate. And features. I know that a balance control might compromise the sound quality, but I miss not having one. Dick Schaus, of import-er RCS Audio International, asks, ‘‘When was the last time you used your balance control?’’ I wanted to use it last night—but it wasn’t there.

I also think there should be output-mute relay protection in case of AC power interruption. (This same criticism applies to the Superphon and Lazarus preamps.) And the external power supply on my Preamp Two buzzed very loudly, although it did quiet down somewhat after a few days; it was still an annoyance, however.

So forget about the preamp and just go with the power amp, right? Well, once again, it’s not that simple. This is a very good-sounding preamp—the most ‘‘tube-like’’ solid-state preamp I’ve encountered. And the moving-coil section is excellent. There’s enough gain to use a very low-output cartridge like the Ortofon MC100U (0.09 mV output) with low noise and very little hum (an excellent combination, by the way). On the other hand, the moving-magnet section doesn’t seem quite so good: the Superphon preamp has more detail, greater soundstage width and depth—greater spaciousness, in other words—but sounds a trifle hard in the upper registers.

By all means audition the Preamp Two. You wouldn’t expect it to be everything and do everything for $150, and the moving-coil section is astonishingly good. Some people pay more than $450 for a moving coil step-up alone. Seen in that light, the Preamp Two is a bargain.

I get out your jeweler’s screwdriver or Allen wrench kit. ST. It should be a simple matter to loosen the setscrew that holds the knob to the potentiometer shaft and move the knob out a tad. Changing the volume control won’t help this problem (except that whoever changed it would probably position the knob correctly). —LA
“I am thoroughly impressed by the Synthesis LM20 monitor. At only $600 a pair, they literally fill a room with music. A remarkable speaker.”

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THE SILENT TREATMENT.

WHY BOB CARVER'S MINIATURE RADIO STATION LEFT THE AUDIO PRESS SPEECHLESS AND HOW IT LED TO THE MOST COMPLETE STEREO TUNER EVER OFFERED.

The new Carver TX-11a Stereo AM-FM Tuner is a technical tour de force which further distances Bob Carver's unique products from traditional electronic components—and which can vastly enhance your musical enjoyment.

TWO TECHNOLOGICAL INNOVATIONS.

The performance of the legendary TX-11 Asymmetrical Charge Coupled FM Stereo Detector Tuner is increased by the addition of Ultra High Frequency Wide Band AM Stereo circuitry. With the new TX-11a, AM stereo sounds as good as FM.

Yes, contrary to popular belief, most AM stereo stations have frequency response (20Hz-15kHz), separation (35dB) and signal-to-noise ratios (70dB) audibly indistinguishable from FM stations of equal strength. It's just that only Carver offers the technology to appreciate this hidden performance.

As for FM stereo, the TX-11a virtually eliminates multipath and distant station noise while providing fully separated stereo reception with space, depth and ambience!

Bob Carver's Asymmetrical Charge Coupled FM Stereo Detector removes (without affecting stereo imaging, frequency response or dynamic range) the hiss, clicks, pops, "picket fencing" and the myriad other unpredictable noises which all too often disturb FM listening.

(Still interested in the story of the miniature radio station and how it impressed hard-to-impress audio critics? Read on. We'll get to it after we explain why the quartz-synthesized TX-11a to Stereo AM-FM Tuner will impress you in your own listening environment.)

A CLEANER, WIDER FM WINDOW ON THE WORLD.

Because of the TX-11a's Charge-Coupling and Leading Edge Detection technology, ownership may very well change your listening habits. Right now, you probably confine your FM listening to those stations which are strong and relatively interference-free, avoiding weak stations and those filled with distortion. Your options are therefore limited. The TX-11a can significantly expand your choices by recovering stations previously buried in hiss or prone to sudden tantrums of noise.

C etron Magazine observed that the circuit, "...may well mean the difference between marginal reception of the station signals you've been yearning to hear and truly noise-free reception of those same signals, permitting you to enjoy the music and forget about noise and distortion."

In Audio Magazine, Len Feldman said "The significance of its design can only be fully appreciated by setting up the unit, tuning to the weakest, most unacceptable stereo signals you can find, then pushing those two magic buttons."

"Separation was still there; only the background noise had been diminished, and with it, much of the sibilance and hissy edginess so characteristic of multi-path interference."

WHY THE ASYMMETRICAL CHARGE-COUPLED FM STEREO DETECTOR GIVES NOISE THE SILENT TREATMENT.

Thirty years ago, the FCC turned clear mono FM into a substandard stereo medium (with fifteen times poorer signal-to-noise ratio) by approving a broadcast system that is extraor-
dinarily prone to multipath and distant-station noise.

This system separates stereo into two different bands. Unfortunately, the bands aren't pure Left and Right. Instead, one band is comprised of those parts of a stereo signal that are common to both channels, (L+R, or mono). The other signal, for more fragile and prone to interference, is the difference between the left and right signal (L-R). It bounces off buildings, hills and other objects, and wreaks havoc when...
recombined with the strong mono signal.

Bob Carver's Charge-Coupling circuit takes advantage of the fact that almost all noise and distortion is exactly 180 degrees out of phase with the signal itself. The TX-11a Stereo AM-FM Tuner conceals these "dirty mirror" images before they can reach your ears. That eliminates up to 85% of the potential noise found in distant or noisy stations.

But Bob wasn't satisfied and knew you wouldn't be either. So another circuit, the Leading Edge Detector, goes a step further by taking advantage of a little-appreciated FM phenomenon: Just 5% of the LF signal actually contributes to the stereo experience. The rest simply gets in the way of skyscrapers and mountains.

The Carver leading Edge Detector operates only on this critical 5% of the LF signal, filtering out noise and restoring just that part of the signal needed by our ears and brain to construct stereo imaging.

Blended back into the mono (L+R) signal matrix, a net reduction of 95% - or better than 20dB of noise reduction - is achieved. All ambient and localizing information is recovered. Only hiss and distortion are left behind. Or, as High Fidelity Magazine put it, "... clean, noise-free sound out of weak or multi-path-ridden signals that would have you lunging for the mono switch on any other tuner."

THE LITTLEST AM RADIO STATION.
Before we describe the remarkable attributes of the TX-11a, we owe you the story that proves just how far performance can be extended when a component comes from Carver.

At a recent press conference, Bob Carver unveiled a small antenna connected to a very low powered AM stereo broadcast transmitter (C-NUAM format) Dubbed "Station CRVR," it sat next to a Carver Compact Disc Player and the same TX-11a that's on your dealer's shelves right now.

Bob Carver routed the Compact Disc's signal to the antenna for reception by the TX-11a, and also directly to a preamplifier.

In front of America's top stereo writers, Bob switched back and forth between the transmitted signal (as received by the TX-11a) and the direct CD signal. All listeners had difficulty distinguishing between the outputs of the CD player and the TX-11a Stereo AM-FM Tuner.

Most could tell no difference at all.

HOW AM STEREO GETS THE SILENT TREATMENT WITH THE TX-11a.

• Unique de-emphasis curve
• Whistle Stop cancelling circuit
• Phase Signal cancelling circuit
• Ultra-low noise balanced station detector
• Very wide band, minimum phase intermediate frequency amplifiers.

Think of it. Compact Disc frequency response and freedom from noise will forever change AM stereo and the TX-11a. Only Carver could pull it off. But then only Carver could do the same for FM, too.

HUMAN-ENGINEERED FEATURES AND CONVENIENCE.

Many tuners with far less exclusive circuitry than the TX-11a have far more complicated exteriors. Bob Carver wanted to make turning stations easy, not impress you with flashing lights or complex programming.

So thirteen presets, wide/narrow band selectors, automatic/manual scanning and the buttons which activate the remarkable Charge-Coupled circuits (Multipath and Noise Reduction) are all tastefully inset into the burnished anodized metal face. Full instrument panel including digital station frequency readout, 6-step 10dB-Interval signal strength LEDs and other monitor functions is recessed behind a panel, visible but not gash.

The result is performance without theatrically Access without complication.

A tuned High Fidelity Magazine called, "By far the best tuner we have tested..."

CLEAR THE AIR BY VISITING YOUR NEAREST CARVER DEALER.

Ask to hear the most expensive tuner they sell (it won't be the Carver TX-11a). Now tune a multi-path-ravaged, hiss-filled FM station. Tune the same station on the TX-11a Stereo AM-FM Tuner and press the Multipath and Noise Reduction buttons. You'll see why no other FM tuner can approach it. And why no other AM stereo tuner this good exists anywhere!
What does it take to be a connoisseur?

With 237 brands of loudspeakers out there, it takes considerable expertise to make the right choice. You’ve got to have a good ear for sonic nuance, a discerning eye for styling, and the sense to discriminate between gimmickry and appropriate technology. To do this takes a connoisseur. And that’s exactly who Acoustic Research had in mind when we built the new Connoisseur Series.

Connoisseur Series speakers take advantage of the Acoustic Suspension bass loading we invented, the wide-dispersion soft-dome tweeters we introduced, polypropylene drivers, and low-diffraction cabinets covered by natural walnut veneers. In fact, you’ll find everything that has made Acoustic Research products the most imitated speakers in history. Not everyone will appreciate them, but a connoisseur will insist on nothing less.
Some years ago, when Audio Research Corporation introduced its solid-state products, the firm got clobbered by its first unfavorable reviews ever. Both Stereophile and The Absolute Sound, each of whose editors had learned to love the sound of tubes mainly through exposure to ARC products, lambasted the new solid-state products for what we judged to be a dryness and general blahness of sound.

Not only was ARC's Bill Johnson personally hurt by what he interpreted as attacks on his integrity and judgment; the company was in the short run also hurt where any company is most vulnerable: in sales. Although neither magazine had in those days a circulation worth spitting at (not more than 5000 each), Audio Research was particularly vulnerable to underground reporting because their products were specifically targeted at the market which comprised virtually all of both magazines' readership. It was some years before Johnson could view any underground magazine as other than an enemy.
Actively courted by TAS, however, Johnson eventually decided to submit another product, which received a rave report. (It was, *bien entendu*, a tubed device.) From that point on, Audio Research and TAS enjoyed a cautiously symbiotic relationship, with ARC submitting only products that TAS was likely to like, and TAS condescending to test them only as long as they got first listen.

Meanwhile, Stereophile went on its merry way, testing only the products volunteered by manufacturers, and never bothering to request ARC equipment because there was always enough of a backlog from other sources to keep its few reviewers fully occupied. But as we read other magazines, we noticed the raves garnered by every ARC tubed component, and it finally occurred to us that we could not stay on top of the state-of-the-art without first-hand exposure to ARC’s products. So commenced our campaign to mend our fences and unburn our bridges.

When approached at CES about the loan of an SP-10 preamp, Bill was clearly unenthusiastic. Although he is too much of a gentleman to tell me to go to Hell, it was obvious that he preferred the security of his known relationship with TAS to the chance of another bad review from Stereophile.

I figured we might as well go for broke, and proposed to Bill something I have never offered any other manufacturer: A “can’t lose” review. If he would loan us an SP-10 for review, we would allow him to review the review before publication. He couldn’t edit it, but he could kill it.

Not surprisingly, Bill agreed to let us borrow an SP-10, but he wanted no subsequent misunderstanding about the terms of that review. He demanded a letter spelling out the terms in writing, with my signature at the bottom. He got it.

This extraordinary concession (the first such, and believe you me, the last), however, turned out to be only the first of many “requests.” The next was that we also accept an ARC D-250 power amplifier for use while testing the SP-10. Since this was merely icing on the cake, we agreed.

There was more. Because the D-250 is a power hog (900 watts no-signal, 1500 watts peak RMS), Johnson asked whether we had a dedicated AC line to power the amplifier. No, we didn’t. Would we please install one before the amplifier came? We agreed. (It’s not a bad idea to have extra power in a room where multi-kilowatts are regularly expended.) We even added two dedicated lines, to better supply a pair of D-250s to biamp our Infinity RS-1Bs. Why not? (By then, I was remembering that a 1000-watt electric heater in my listening room had added $100 a month to my electric bill. Two 2000-watt devices would, I calculated, do even more interesting things in the coming months.)

Did we have a pair of Infinity RS-1B speakers in the house? When this procedure started we didn’t, but by the time ARC was ready to come we’d had the RS-1Bs for a year. Would we send ARC the electronic crossover for upgrading? Well, okay.

Did we have an Alpha 2 cartridge, a Well Tempered Arm, and, preferably, the latest model VPI ’table on hand? We had the arm (in fact, we had a report out on the arm before it was discovered by W&I), but not the cartridge or the turntable. Please get an Alpha 2, we were instructed, and perhaps your SOTA Sapphire will do if it’s upgraded with a Supermat. Always eager to be bullied, we acquiesced to that request as well.

Then we learned that two power amps and a preamp weren’t all that we were to receive. Along with them would also come a representative of Audio Research, who would install the equipment and see that everything was working right. Apparently, Bill J. did not trust us to set up his equipment properly.

Now, there’s such a thing as wanting to put your best foot forward, but it was beginning to look as if what we were in for amounted to a rigged demonstration. All of these other components that ARC “requested,” apparently as preconditions for a loan of their equipment, had worked well for them at recent CESs, earning for the company

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1 This isn’t quite accurate. In recent years, Peter Moncrieff of IAR has been getting first crack at everything from ARC, presumably because of his advanced technical understanding. The fact that his reviews are without exception out-and-out raves might also enter into the equation. Nor do I blame Audio Research; were I a manufacturer I would do everything ethical I could to garner good reviews and avoid bad ones.

—LA
Stereophile's Best Sound At Show award three years in a row. Fair enough. But neither the speakers nor the cartridge were what we felt to be uncolored transducers (see my review of the Infinity speakers in Vol. 8, No. 4, and my review of the most recent version of the Alpha 2 in this issue). Moreover, dedicated wiring for power amps, and personal installation by a representative of Audio Research, could hardly be considered "typical" of the in-home use conditions on which Stereophile claims to base its reviews. Would this really be a fair "consumer test" of ARC's products?

I have very mixed feelings about this kind of thing. Over the years we have always enjoyed visits from manufacturers; it gives us a chance to get to know them under conditions a little less hectic than those at CES. But these visits are definitely more than social. Usually, the visiting manufacturer also arrives with his latest, hottest product, just dying for us to listen to and (of course) pass instant, enthusiastic judgment on it. The best we can do on such a brief listen is to say, "Gee, it sounds kinda nice," or, if it doesn't, to ask, "Is that the way it's supposed to sound?" (The answer to that is, typically, "It needs time to break in." I have often been tempted to ask, then, why it hadn't been "broken in" before it was delivered to us, but I haven't as yet.)

listen to their latest and greatest, and I appreciate having someone else set up and tweak out a pair of loudspeakers for best performance in my listening room. On the other hand, I believe that, if I am to do a consumer-oriented report on a product, I should set up that product just as a consumer would have to do: with no help from the manufacturer other than the supplied instructions. Obviously, Bill had other ideas: he wanted to make damn sure I heard his products to their best possible advantage. Period.

Several dates were set for ARC's visit, then broken at the last moment; twice because of conflicting commitments at Audio Research, and the third time because "we have a new preamp coming up, and would prefer you get one of those when it's in production." It was, of course, the SP-11 that we had been hearing rumors about.

At about that time, LA and JGH decided it might be worthwhile to pay a personal visit to ARC on their home turf, with a side trip to Magnepan as an added incentive to brave the Minneapolis winter. That junket was both enjoyable and enlightening. We received a cordial reception from both manufacturers, and were given guided tours of their respective factories. We were disappointed that Bill Johnson was away and unable to guide us around the factory that more than fifteen years of his life have gone into, but his deputies Leonard Gustafson and Jack Hjelm received us most cordially.

(At Magnepan, Jim Winey and longtime personal friend Wendell Diller hosted us, which included attendance at a Minneapolis Orchestra concert—Holst's Planets and Tchaikovsky's Piano Concerto No. 2. The Minneapolis, under Neville Marriner, was magnificent, especially for the Planets. It was one of those experiences that reminds you just how far high fidelity has to go.)

In Audio Research's impressive-looking listening room, we got our first listen to the new SP-11 preamp, and even that brief listen (through unfamiliar loudspeakers) was enough to convince us that the SP-11 was going to be something special.

Sometime after our visit, an agreed-upon date worked out for everyone. Jack Hjelm phoned the day before to tell us he had shipped the equipment, and would board the plane for Albuquerque the next morning. At last! LA agreed to meet him at the airport.

That same day, I received three cartons from UPS, containing an SP-11 preamp, its separate power supply, and a slew of Audio Research's custom-made interconnects and loudspeaker cables. Unfortunately, by the time Jack arrived, neither of the D-250s had. (One had been sent by air, the other by truck. The air shipment arrived the next day, but the trucker, who was in Santa Fe on the second day of Jack's visit, got tired out before he dropped it off. It was the week-

2 Actually, it was more even. We had missed an impressive video demonstration by Magnepan at the last CES, and wanted to have them put it on for us. Plus, Bill Johnson had long before extended a standing invitation for us to visit their plant and check out their in-house reference system.

—LA
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end, but so what! LA ended up hiring someone to drive to Albuquerque — where the trucker had dutifully returned the amp — to pick it up.)

The first thing Jack did upon arrival was to plug in the new SP-11 preamp and turn it on, to get it properly warmed up. We’ve found both before and since that this is the most practical thing a manufacturer, or reviewer, can do to ensure a positive review. Practically every good product we’ve had in the house manages to sound quite positively awful during some aspect of its warming up.

While it was cooking, I suggested that Jack take a listen to the system already set up in my listening room. At that time I was driving Martin Logan Monoliths with a pair of Threshold SA-1 power amps, a Conrad Johnson Premier Three preamp, and a variety of signal sources, getting what I considered to be pretty respectable sound. Jack was unimpressed. It seemed that the things he looked for in reproduced sound were quite different from what I consider important. (This later became obvious.) He wanted to set up the Infinity RS-1Bs, but we decided to wait for the arrival of the D-250s before hooking up the 1Bs; we stuck with the full-range Monoliths.

Jack suggested we try a pair of Audio Research’s interconnects between the preamp and power amps. Eventually we used their wires between tunable and preamp, between CD player and preamp (though not for the work Jack was doing), and between power amp and speakers. The difference was quite dramatic, and seemed to go in the same direction for each of the ARC wires. The sound was much smoother, sweeter, and “more agreeable,” but also shorn of some of its “bite” and capability for aggression. On the Martin Logans, the ARC interconnects just about eliminated the problem I’d had with recurrent brightness, but I did not agree that the difference represented a 100% improvement; live music does, after all, have sharp edges, and the Audio Research cables had diminished the system’s ability to reproduce them. Since that time I’ve found that combining Audio Research cables with some others of different characteristics (the Monster Cable, and the Brisson speaker cable) works well.

After the preamp had cooked for about an hour, we substituted it for the Conrad Johnson Premier Three and gave it a quick listen. It was my turn to be unimpressed. By comparison with the Premier Three, the SP-11 sounded wiry, somewhat rough, and a little pinched. We decided to let the SP-11 percolate longer. Then the first D-250 arrived, by air freight, and Jack and Larry proceeded to unbox it. I was appalled! Like a person who is, for the first time, close enough to an elephant to touch it, I had never realized how huge these amplifiers are, or how heavy. Each is just a little larger than a countertop refrigerator, and weighs a back-breaking 136 lbs!

Jack then set about the formidable task of installing the tubes. To avoid damage in shipment, these are separately packed, in numbered boxes whose numbers correspond to their socket numbers in the amplifier.

Jack is meticulous. Instead of just inserting each tube in its indicated place, he checked each one for type before plugging it in. And guess what? Two were misnumbered. This would have put the wrong tubes in the wrong sockets if the installation had just been done by rote. It may or may not have caused damage, but one thing is certain: the amp wouldn’t have worked.

There’s a lesson to be learned here: Even the most meticulously perfectionist companies like ARC occasionally make mistakes, so always check tube types as well as written-on numbers when installing or replacing tubes. In a stereo amp, tubes are nearly always symmetrically placed; if different types are in what appear to be corresponding locations in L and R channels, investigate before proceeding.

When he was done, and started to replace the amplifier’s perforated cover, I suggested that we try the amp bare-assed to begin with, just so we wouldn’t have to remove the cover if one of the tubes failed on turn-on (the Moment of Truth with tubes), Jack demurred, and not entirely to avoid shock hazard. It seems the output tubes have been known to be so damaged in shipment that they could explode with some violence. In fact, if there’s one thing we learned from
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Jack—and there were many—ARC owners should not trifle with the protective covers for their amps. We replaced the cover.

The SP-11 had now had three hours to warm up, so before connecting the D-250, we gave the preamp another listen. It was much improved. Now, compared with the Premier Three, it had tighter midbass, deeper bass, crisper yet sweeter highs, and very slightly better depth and spaciousness.

With two stereo amps available, we could now use the RS-1Bs, so the Monoliths were wheeled out on the hardand and the Infinitys set up in their place. Now, I had previously spent a week experimenting with placement of the Infinitys to coax what I felt to be the best possible sound from them, and had laid masking tape strips on the floor to mark their locations.

We had only listened for a short time when Jack declared the sound to be "wrong." Whipping out a cute little Heath spectrum analyzer (see BS's review in Vol. 9, No. 3), he fed pink noise through the system and immediately observed that the lower middle range was elevated. "Hmm," said he, "we've gotta get rid of that." And so saying, he did some creative diddling of the loudspeaker toe-ins until the analyzer measured a surprisingly flat response through the lower middle range. I did not tell Jack that I had worked my tail off to elicit that response hump from the speakers, because it made them sound much more realistic. (If you want more on the subject, see my diatribe against flat response in Vol. 8, No. 4.)

Then, while we waited for the second D-250 to arrive, came for me the first shocker of the visit. Jack mentioned that he had orders to modify our borrowed (from Infinity) RS-1B speakers. The modification consisted of soldering all the plug-in connections to the drivers. I suggested we get Infinity's permission before proceeding, but LA shrugged noncommittally so I shut up and looked on, rather sullenly. Where, I wondered with increasing irritation, was this ARC takeover going to end?

Finally, we were ready to go with the modified speakers, but the second D-250 still hadn't arrived. We had no choice but to use the solid-state (Ecch!) Threshold SA-1s on the low end, no matter how good they sounded!

After an hour of working over driver placements and balance adjustments, Jack was still dissatisfied with the sound. Jack suggested changing my entire seating and loudspeaker-placement arrangement.

I had my listening seat against the rear wall, with 2-inch vinyl-coated fiberglass all along that wall behind my head to prevent reflections, and the speakers located about 9 feet from the seat and roughly halfway along the length of the room. This midroom speaker placement (there's approximately 13" behind the speakers) yielded the smoothest, tightest low end I had been able to obtain, the rear-wall listening position gave the deepest bass the room would support, and the relatively close loudspeaker placement minimized detail loss due to spurious room reflections.

I explained all this to Jack, who seemed not to hear a word of it. To me, this latest development was further indication of what began to look more and more like outright arrogance on, not Jack Hjelm's, but Audio Research's part. How Bill Johnson can feel that he has the only valid views on such matters escapes me. I wondered: Does WZJ have his own hotline to God? Or does he ascend Mount Sinai periodically, and return bearing stone tablets inscribed with The Ultimate Truths of Audio?

The listening room was duly rearranged. During this tedious process, Jack mentioned a precaution that needed to be observed when using the D-250s. They must never be pulsed with DC; it can wipe out a whole bank of output tubes in one fell swoop, or weaken them so they will eventually fail, to the tune of $150 replacement cost.

I found this a bit alarming. There are entirely too many things in an audio system with the capability of producing DC pulses, and it seems unreasonable to expect the user to remember all of them, all the time. Unless you use an SP-11 preamp, which

—I shall not trouble you with the rest of the facts. I have simply mentioned the salient points you needed to know, so you could understand the reason for my irritation. This is such a constant factor in the system that I have lost count of the number of times I have changed the speakers' wiring, to no avail. Finally, I came to the conclusion that the speakers were bad, though this proved impractical. 3

3 Better communication from LA could have averted this shock. Jack Hjelm had told me previously of his intention to solder up the Infinitys, and even wanted to change all of the speakers' internal wiring, though this proved impractical.

4 Since the time this was written, my listening room was treated with ASC's Tube Traps (see Vol. 9, No. 3), making it possible to get full, smooth bass from a mid-room listening location with speakers near the rear wall.
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doesn’t pass DC. But what of D-250 users who own a different preamp? Better be careful. Eventually, a pulse of DC will happen. Why, I wonder, didn’t ARC build in protection against this kind of thing?

We’ve had amplifiers in the house that could handle large amounts of DC input without self-destructing or trash ing the woofers, because those amps included protection circuitry to prevent such damage. Granted, it may be difficult to design a protection circuit that has no detrimental sonic effect when it isn’t needed, but the fact that it has been done proves it can be done. When you’re dealing with amplifier powerhouses like these (and the Rowland Sevens, which are DC protected), it is necessary to ensure that their great power for good is not diverted to the dark side. I think Johnson can—and should—add DC protection to the D-250 without either degrading the sound or unreasonably increasing the price. The knowledge that they are susceptible to such damage gives me the feeling, when using them, of tiptoeing on eggshells!

Finally, Jack having placed the speakers to his satisfaction, he proceeded to balance-out the woofer columns against the upper-range panels. He ended up with the bass control nearly all the way up, yet to my taste, the low end was still inadequate. The sound was, however, very similar to what I had heard in ARC’s CES demos for the past few years: soundstaging and imaging were superb, while the overall sound was extremely meticulous, clean cut, focused, and a little cold. I understood now why Bill had not played symphonic music at shows (at least not for me): through this system, as ARC set it up, large-scale works sounded rather thin and pinched. Sheffield’s pop discs, many of which tend to have rather heavy (although tightly detailed) low end, sounded very well-balanced through the system, but most other recordings, whose low-end balance hinges more closely to the average for good recordings, were a little on the thin side.

I expressed my misgivings about the spectral balance, but Jack was convinced that this loudspeaker placement and bass/treb le balance were the closest to correct he could get in my room. The spectrum analyzer clearly showed that the response was now almost perfectly flat. He suggested that I “live with” the new sound for a while.

I still have great respect for Audio Research’s judgment, as evidenced both by the sound of their products and the sound they get in their CES exhibits. But, contrary to Jack’s assurances, the more recordings I listened to on the system as it was now set up, the more I became convinced that its spectral balance was skewed towards the upper ranges.

And that was only from analog discs. From all other signal sources, the system sounded much worse. Why? Well, Sir, ARC had committed what to my mind is the most common error in high-end audio: consciously or otherwise, they had adopted (and insisted that I use) as a “reference standard” signal source a cartridge which, for all of its positive qualities, is colored through the middle range (laid-back). They then worked carefully over loudspeaker placement and balancing to get what they felt to be the best sound possible from it. The result, inevitably, was a system that could only sound worse with all other signal sources—analog tape, digital tape, FM, CD—which do not share that cartridge’s coloration.

Within three days, I had the system back to the way I preferred it, and only then could I begin to appreciate what Audio Research’s electronics and RS-1B modifications had done to the sound from those speakers. They were transformed! They now produce a degree of detail, clarity, and smoothness of which I had not believed them capable. I really find it hard to believe that Infinity is unaware of how much those clips are compromising the sound. (I am told that there is a second such weakness in the EMIMs and EMIT drivers themselves: The connecting terminals are not soldered to the diaphragms, either; they’re riveted!)

As for the SP-11 and the D-250s? I’ll be reporting on those for a later issue. Yes, Bill, you will get the promised advance copies for approval. I don’t think you’ll kill the reports, though, because I am obliged to agree with everyone else who tests your tubed equipment. I still cannot believe it is as good as my ears tell me it is.

Stereophile

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Improving CD Players with Polypropylene Capacitors

George Graves

Publisher’s note:
No article in recent Stereophile history has generated the reader response of George Grave’s first piece for us: “The Meridian MCD CD Player, A Second Opinion” (Vol. 8, No. 4). In that article, GMG referred to bypassing the output capacitors of the MCD and the resultant improved sound. Since then, we’ve been deluged. We’ve also set a record for tardy response: first, the article didn’t arrive from the author; second, the Editor sat on it; third, the Publisher ran out of space in the last issue. Here it is.

Readers should be forwarned that any modification of their CD player will almost certainly void their warranty, and that Stereophile therefore does not recommend such action. Proceed at your own risk.

Several months ago, I happened to mention that I had compared the Meridian MCD player with my “modified” Magnavox FD1000, and had found the MCD wanting. The mod consisted of replacing the Maggy’s dubious-quality aluminum electrolytic output capacitors with some polypropylene “Wondercaps.” Little did I realize, as I wrote that article, the
furoirthewouldcause!AccordingtoLarry Archibald,ourrenownedPublisher,Stereophile hasbeeninundatedwithlettersfrom readerswantingtoknowhowtomodify theirCDplayerstogettewondersoundsound.

Actually,themodisquiteeasy—noon parts have toberemovedfromtheplayerto effect thenecessarycircuitchanges.But I do have a few well-chosenwordsofcautionto extend tothosegentlereaderswhomaybe contemplatingthismod:

• Itwill,inalikelihood,voidyour warranty.

• Themodispossibleonlyonplayers whichusedigitalfilteringandoversampling. Machines suchasthefirst-generation Sony (ormostotherfirst-generationJapan- ese machines)cannotbeso modified.

• TextandillustrationswillrefertoMagnavoxplayersandsomeoftheirderivatives. Other machines (suchasthenewSonys with the"UnilinormalConverterSystem")can be modified, buttheuserwillhavetolocate theoutputcapacitorsonhisown.

• If youarenottechnicallycompetent, leave this mod to a qualifiedtechnician, or pass it up altogether.

Tools You Will Need

• A small pair of diagonal cutting pliers.

• A small pair of needle-nosed pliers.

• Various screwdrivers, both slot and Philips type.

• An electric drill motor with drill index.

• A small adjustable crescent wrench.

Parts

You will need four 10 mFD (microFarad) "Wondercaps" (twoforeach channel wired in parallel toequal 20 mFDperchannel). Wondercapsarenot easytocomeby, butwe have located agoodsource:Precision Audio Supply, P.O.Box 96, Downey, CA 90241, (213) 869-6804.

The last two items needed are a chassiboxyabout 5" by 3" by 3" to house the caps, andaset offour panel-mount RCA jacks (I recommend the gold ones, also available from P.A.S.).

Let'sget started!

The following description of how to get inside of the Magnavox FD1000 or FD1010 also applysto the Meridian MCD player. The other Magnavox players (suchasthe FD1040)havethesamecircuitry,buttheir cases differ. Owners of those machines will have to figure out how to getinside of them on their own.

Turntheplayeroveronitsback.Youwill findfive deep screw holes: four located at the bottom cover's corners, and one on the left side, justabovetheraisedportioñ with the "UL" sticker on it. Removethesewitha medium Philips screwdriver. The bottom cover will now lift off.

Turn the unit over and carefully lift off the top cover. Wires connect to this cover, so carefully place it in front of the unit so that the wires are not disturbed. With the exposed chassis facing you so that the disc spindle is on your left, you will see, to the right of the spindle, a cast zinc box with a perforated top cover. Using the correct size flat-bladescrewdriver,removethesinglescrew on the extreme right of the per- forated cover. Gently pry up the cover and lift it off, being carefulnot to lose the long spacerunder the remaining screw. You will now see the solder side of a printed circuit board. Removethetwoscrews on the board's left side (these are not normal screws, but a flat-blade screwdriver with a thick blade will remove them, if you are careful). Lift the board up until it stands on its right side. If you move the board a little more to the right it will slip into a pair of slots cast into the zinc box. These are pro- vided to hold the board inan upright posi- tion for servicing. Neat, huh?

Lookat the bottom of the standing board neartherear hold-up slot, on the compo- nent side, and you will find two thin, shielded cables coming off the board and leading tothebackof the unit, where they are soldered to the two RCA output connectors. When you have located the wires, findwhere they are soldered to the circuit board, then follow the circuit path back on the board in line with where the wires attach. Aninchor so back, you will see two 23 mFDelectrolytic capacitors standing on end, side-by-side.

These capacitorsare easy to spot, near the back edge of the board. To check yourself, lookbehindthem (in a straight
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line from where the two shielded wires attach to the board): there you should see two eight-pin ICs. Found them? Good.

Turn the board over to the trace side of the circuit board. Find the eyelets through which the leads for the capacitors are soldered. Take a small piece of solid wire and tack-solder it across the eyelets of each capacitor, being careful not to solder the two caps together! Try to keep your soldering time short to avoid lifting the trace, but be sure you have a nice shiny solder joint when you are finished. You have essentially removed the stock capacitors from the circuit by shorting them out.

All that is left is to reassemble the case. When replacing the top case-half, press the plunger on the power switch (front left-hand corner of the unit, in front of the disc-spindle area) sideways with your finger as you lower the cover over it. If you don't, the power-switch assembly will jam and not work.

That's it! The modification of the actual player is now complete. All that remains to be done is to build the outboard capacitor box containing the Wondercaps. Caution: Do not ever connect your CD player directly to your preamp again! Without the capacitors in the circuit, there are about 15 volts of DC on the CD player's outputs. Such a large DC component can and will easily damage your preamp, your power amp, and your speakers!

**Building The Capacitor Box**

This box will house the Wondercaps, and will be located in-line between the output of your CD player and the input of your preamp.

Drill two ½" holes, side by side, in each end of the box. Mount the four RCA jacks in these holes. Be sure to use the lock washers and tighten the nuts real good, as these types of connectors have a habit of working loose after a while. Place two Wondercaps together, side by side. Wrap the leads of one of the capacitors around the leads of the other, and cut off any excess lead. Solder them. You have now wired the two capacitors in parallel. Do the same with the other pair; when you finish, you should have two sets of two caps, and only two sets of leads.

Now, solder the two caps to the terminals of the jacks in the box, with the lead on one end of the cap going to the jack at one end and the other lead going to the corresponding jack at the opposite end of the box. Repeat the procedure for the other cap. Since Wondercaps are non-polarized, it makes no difference which end is which, but, for clarity, mark one end of the box "input" (L and R) and the other end "output" (L and R). If your box is metal (recommended), you need do nothing more than assemble the top on the box and hook it up between your CD player and preamp. If you used a plastic box you will have to connect the "ground lugs" on all four jacks together. Do this with one piece of buss-bar type solid wire threaded through all four lugs. Solder it well to each one.

**Hooking It Up**

You will want to keep the leads between the CD player and the cap box as short as possible. For that task, you can construct your own cables, or purchase a pair of Monster Cable Interlink 4s. These can be had in ½-meter (20") for non-metric reactionaries) lengths, and I recommend them. You are now ready to listen, but I have one further caveat. Keep your volume control all the way down when you turn the CD player on or off. The capacitors are not in the same spot in the circuit occupied by the old caps, and, while they do what the old caps did, they can cause a "pop" in some preamps because of the new position.

Play a disc with which you are familiar, preferably one with good string sound. You should notice an immediate and profound improvement in the top end. You should also notice an improvement in the soundstage with regard to height and width, but the degree of improvement will depend upon the quality of the recording and the associated components.

**One final time:** don't expect any manufacturer to honor a warranty after you've carried out this mod, and don't ever use the preamp without the capacitor box. Extend this warning to any friend you might loan your CD player to.

Happy Listening!
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All CWD cabinets and accessories available in handsome Dark Oak (shown here), contemporary Natural Oak, and classic Natural American Walnut.
Preamplifiers have always been the weakest link in top quality audio systems. A look at typical preamplifier specifications might lead one to believe that the preamp should be the strongest link in the audio playback chain, yet if one could imagine a preamp with all of the strengths and none of the weaknesses of the top preamps, one could imagine just how poorly each preamp would compare to this composite preamp.

The SL-1 would beat this composite preamp, by a wide margin. It not only combines the strengths of the other top preamps but actually betters each in its area of greatest strength. This is the true meaning of "State of the Art."

The SL-1 is the culmination of over a decade of research and development. We believe that no other preamp has been so carefully engineered using both objective measurements and subjective listening tests. Extensive usage of "Straight Wire Bypassing" ensured that the selected component or design was indeed more accurate, rather than simply more pleasing in the test system. The result is a preamp which has proven to be far more transparent than all competitors in many different systems.
Publisher's note:
The following article is presented with no claim for absoluteness. (In fact, just as we go to press we received a manuscript from Philip Greenspun, Product Review Editor of Computer Music Journal (Cambridge, MA), who had precisely the opposite result when comparing CD to analog versions of the same recording.) The tests described are neither single- nor double-blind, and the author's decision to forego conversation while listening to the same products does not by any means guarantee lack of mutual influence—especially because their musical tastes are so well known to each other. Moreover, repeating the test with different phono equipment, a different CD player, and a different replica of the master tape would likely yield somewhat different results.

Nevertheless, I think the basic conclusion is sound: good CD reproduction is remarkably close to a fairly good version of master tape sound; there's a good chance that it's more accurate than what you'll get from the average cartridge, tonearm, and turntable.

JGH plans to do some solid investigatory work at record companies on the West Coast, to bear just what degradations occur when going from analog (and digital) master tape to record, CD, and analog copy. His results should prove fascinating.

ANALOG V HOME-BREW EDGE OF

Jay Clawson & Chuck Zeilig

It's a rainy Saturday afternoon, and you're in your favorite record store. Windham Hill has just released a new George Winston performance on both LP and CD. Which do you buy?

As music lovers and committed audiophiles, we've been wrestling with this conflict for more than two years. Considering the hype from the CD promoters, as well as the obvious vested interests of the detractors, it's difficult to know what to believe. We finally decided that the only way to resolve this dilemma for ourselves was to devise a listening test stringent enough to determine the absolute quality of digital versus analog disc reproduction.

The improved second- and third-generation CD players on the market also made us feel the time was right to determine whether digital reproduction is good enough for the most critical audiophile. We wanted to use equipment with resolving power at or near the state of the art. The method we describe for these evaluations does not require special test equipment and can be reproduced by anyone.
Charles E. Zeilig, whose PHD is in physiology, left medical research three years ago to pursue his hobby. Since then he has been an audio consultant at Listen Up, Inc. in Denver, Colorado. Listen Up sells the Nakamichi Dragon cassette deck, Apogee speakers, Goldmund speakers, Monster Cable Alpha 2 cartridge, and Mark Levinson electronics mentioned in the article. Jay L. Clawson, an engineering manager for Rockwell International, has been an avid audiophile for 15 years.

The Premise of the Listening Test

Because we were aware of the vagaries of subjective evaluations, we sought some reference standard to which we could compare the accuracy of CDs, and analog records (ARs). In our previous comparisons of performance-matched ARs and CDs, we had discerned significant differences. The problem with these tests was our inability to know what the original master tape sounded like. We reasoned that an analog copy of the original master tape could be used as a control to judge the faithfulness of either CD or analog record playback to the original recording. According to the digital critics, even though a first-generation analog copy of an original analog master tape might suffer some degradation, it should be free of presumed

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1 In reality, this statement is based on the assumption that the cassette copying and playback process involves less degradation than either analog record or CD playback. This assumption could be tested by comparing the cassette to the master tape.

—LA
digital artifacts. It should therefore sound more like the AR than the CD, at least in terms of timbral balance, harmonic structure, ambience and placement of instruments, thus giving our test a mild pro-analog bias.

With Nakamichi's recent release of high-quality real-time cassette copies of master tapes, we felt the appropriate software was now available for conducting direct comparisons between the highest quality analog recordings and their tape and CD counterparts.

The Equipment

Test System One was located in the familiar listening room of one of the authors of this article. The analog record playback system consisted of the original Rock turntable, a Triplanar tonearm, the Goldmund record clamp, and the latest Monster Cable Alpha Two cartridge. Overhang, azimuth, and VTA/SRA were carefully adjusted. Final characteristics of the setup were measured with an Ortofon TC3000 test computer. The cartridge/arm combination displayed only a slightly rising high frequency response of 1.0 dB (left channel) to 2.5 dB (right channel) at 15 kHz, going up to 2.5-3.2 dB, respectively, at 20 kHz. Vertical resonance was undetectable; horizontal resonance measured 8 dB at 8 Hz. The speaker system used for most of the testing was the full-range ribbon speaker from Apogee Acoustics, biamplified with two Mark Levinson ML-9 amplifiers. The preamplifier was the Mark Levinson ML-7, fitted with L3A moving-coil phono boards. A Nakamichi Dragon cassette recorder was used because of its special ability to correct automatically for azimuth and phase errors in prerecorded cassettes. The compact disc player was the Meridian MCD, chosen for its sonic superiority over other players on the market at the time of these tests. Mogami Ne6lX 2497-06 was used exclusively throughout the system for shielded interconnects. The speaker cables were Kimber Kable 8PRVS.

Test System Two in the listening room of the other author. This system was composed of Goldmund speakers, Rowland Research custom-made electronics, and an Oracle Delphi turntable (with Mod Squad power supply) fitted with a Lustre GST-801 tonearm and Panasonic Model 451C strain gauge cartridge. The Meridian MCD and Nakamichi Dragon were used as before. Randall Research wires were used, slightly superior to the Mogami 2498-06 used elsewhere in the system. The notable characteristics of this system are two: First, because of its essentially line-level output, a strain-gauge cartridge eliminates the need for any low-level preamplification stage. This should result in an increase in clarity—or reduced electronic veiling—compared with the sound produced by a moving coil cartridge. Second, the Goldmund speakers, because of their sound dispersion pattern (combined with judicious use of Sonex to damp primary reflections), permitted a better assessment of imaging compared with System One.

The Music

We chose four selections that would allow us to examine different aspects of sound reproduction, and obtained identical material in three forms: Nakamichi cassettes recorded on TDK metal tape using Dolby C and made from a composite master tape; original Sheffield direct-to-disc vinyl records; and compact discs produced from the same composite master tape used for the Nakamichi cassettes. We cleaned the records with a VPI-16 record cleaning machine, and immediately treated them with LAST record preservative. We also used Stylast on the cartridge during playback. The CD and Nakamichi tape selections were from the Sheffield Creme de la Creme.

---

2 The Rock turntable was used because it had demonstrated to us its superiority over a number of other high-end turntables in image focus and detailing.

3 Sheffield prepared the composite by taking a master tape (of which they had several) from each performance, cutting the selected track from the overall recording session, and splicing the selected tracks together to make a new composite master tape; this tape was then used as the master to make the first-generation Nakamichi cassette.

4 Please note that a real problem is introduced here, one that's been evident every time I compared a Sheffield direct-to-disc to a Sheffield Treasury series disc: the Treasury series, made from the backup tape referred to in the article, sounds distinctly less life-like compared to the direct-to-disc. If the Nakamichi cassette and CD overcame this problem, they did better than Sheffield did when cutting the backup disc!
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sampler. Both authors were intimately familiar with the selections, which were:

**Thelma Houston**, *I've Got the Music in Me* (Sheffield Lab 2, recorded 1976), title cut. The same backup analog tape was used to produce both the CD and cassette versions.

**Amanda McBroom**, *Growing Up in Hollywood Town* (Sheffield Lab 13, recorded 1980), "Amanda." Cassette and CD were derived from a backup analog tape.

**Amanda McBroom**, *West of Oz* (Sheffield Lab 15, recorded 1981), "Gossamer." Cassette and CD were derived from a backup digital tape.

**The Sheffield Track Record** (Sheffield Lab 20, recorded 1982), "The Higher You Rise." Cassette and CD were derived from a backup analog tape.

**The Listening Method and Criteria for Evaluation**

The tests were conducted over a three-day twelve-hour period at the sites of Systems One and Two. Our listening procedure had been developed and refined over a two-year period in which we had established a vocabulary that allowed us to communicate clearly with each other.

Each listening comparison started with careful gain matching between components. Our usual approach was to play a selection completely through, repeat the selection on the alternate playback system, then repeat this cycle for as many times as it took to satisfy both of us that we had heard specific differences. To ensure that we did not influence one another, no discussion was allowed during this time. Once we were satisfied with our initial impressions, we described to each other the differences we had heard. If one described a difference not heard by the other, we repeated the comparison until both agreed about what we had heard. (In previous equipment evaluations, we had sometimes “agreed to disagree” in our value judgments about differences, but we have always been able to precisely verbalize, in nonjudgmental terms, what differences existed.) In these tests, however, there was not a single point of disagreement. As an additional listening method, we synchronized pairs of playback components and switched between the two. This permitted quick identification of major differences in tonality, bass impact, and clarity.

We listened for specific sonic characteristics, using well-defined criteria to establish value judgments. We were greatly aided in selecting specific criteria by numerous descriptions in the underground audio magazines of what is purportedly wrong with digital recordings: reduction of bass energy, limited treble extension, frequency-dependent phase distortion, high-frequency roughness, ringing or harshness, loss of low-level information (e.g., deficient ambience retrieval or truncated decay on instrumental tones), lack of proper instrumental timbre, and various imaging distortions. With respect to imaging, we made specific judgments regarding stage width and front-to-back depth, front-to-back layering of instruments, and instrument focus (i.e., the apparent size of instruments or soloists). We were also able to discern differences in clarity. In fact, clarity proved to be one of the major differences between media, and we have attempted a crude quantification of this property on a scale of 1+, 2+, etc., with 1+ being a conservative minimum resolution. To us, an increase in clarity means a decrease in veiling akin to reducing the amount of circuitry through which a signal must pass. Clarity is distinguishable from detailing by thinking of the latter as a reduction in blurring of closely spaced transients (such as a rapid staccato guitar riff), or in the degree of separation of individual violins in an orchestral passage.

In our experience, clarity and imaging are both affected by a recording's absolute phase. Phase differences were readily apparent in our listening tests (we preferred the Sheffield records and tapes in reversed phase, though we're told that all but the Thelma Houston have correct absolute polarity), and we took pains to insure that each pair of sources was matched for absolute phase. For the benefit of readers who want to reproduce our results, the Meridian MCD was known to exhibit reversed phase polarity with respect to the tape and phono playback systems, so we
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reversed the polarity of both speaker leads when using the tape and phono systems.

The Results

First we compared the CD with the Nakamichi cassette. Our initial impression was that the cassette copy had tighter focus and greater clarity (magnitude 1+), greater detail (but only in proportion to the differences in clarity), and a slightly more emphasized bass response. Other than the slight differences in bass and clarity, overall frequency balance, dynamic range, timbre, instrument position, and stage size were not obviously different. These conclusions were consistent for all test cuts. However, the Meridian CD player came with a supplemental instruction sheet suggesting that another CD be placed on top of the one being played, and this we had forgotten to do. When we repeated the comparison with the double CD, the results were completely reversed: the CD now had the better focus and clarity. Bass response was now about equal. Other than focus and clarity, we could discern no further differences in any of the listening criteria. The addition of the second CD boosted the clarity of CD playback by magnitude 2+, now exceeding the tape by magnitude 1+.

On the basis of these results, we are forced to conclude that not only is the CD an extremely accurate facsimile of the original master tape, but is, in fact, superior to a first-generation cassette copy of the same original master. These results were surprising to us. Since we had no idea of the magnitude of the losses suffered during production of the CD and the cassette from the original master tape, we were eager to compare the CD and D-to-D analog record directly. The results follow:

Amanda McBroom, "Amanda."

With a single CD in the Meridian, the CD exhibited a slight edge in both clarity (magnitude 1+) and image focus. With the analog, the position of all instruments seemed to be constantly shimmering or vibrating, whereas with the CD the instruments were firmly fixed in space (this shimmering effect is small on the Rock turntable but quite pronounced on many other high-end turntables). When we repeated the comparison with a double CD, even larger differences favored it. The clarity (now magnitude 3+), detailing of instrumental overtones, and image focus were indisputably superior on the CD.

With System One we perceived no differences with respect to front-to-back or side-to-side placement of instruments. We noted significant differences in System Two's imaging and timbre between the AR (as played through the Oracle/Panasonic combination) and both the tape and CD. The cartridge introduced a boomy quality at low frequencies and an extra brightness at high frequencies compared with the reference tape and the CD. Despite this bright tonality, however, the sound of the turntable system did not exceed that of the tape or CD in subjective clarity. Image width, front-to-back depth, and focus were also notably diminished compared with those of the tape or CD. For example, McBroom's position moved quite far forward and was more diffuse. The clinical dryness and deficient ambience, frequently noted by digital detractors (and which we, too, had perceived with some CD players), were not present in this comparison. Indeed, for every evaluation criteria we tested, the CD was preferred over the record.

Amanda McBroom, "Gossamer."

This selection's direct-to-disc recording session used a digital recorder as a safety backup. This was the only selection in our comparisons that was truly digital from recording to playback media. We included it in an attempt to quantitatively compare differences between CDs made from original analog or digital master tapes with their D-to-D counterparts. The CD version of "Gossamer" definitely contained more high-frequency information and overall clarity than the record. The piano accompaniment, in particular, sounded more "alive." The CD also conveyed more focused images for McBroom's voice and the backup instruments. Despite several attempts, however, we could not reliably determine whether using a high-quality analog master tape was better or worse than using a digital master for the CD source.

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We first auditioned this selection with the single CD in the Meridian player, and, with System One, the record exhibited fuller and more satisfying bass with System 1. This perceived difference is a common complaint among most CD critics, and is a characteristic we had noted during previous CD/recording comparisons. However, with a double disc in the Meridian, the bass tonality and impact were nearly indistinguishable between the CD and the record, and a distinct advantage in clarity belonged to the CD. Thelma Houston, "I've Got the Music in Me".

Of all the comparisons, this was the most interesting. Comparing CD and D-to-D versions on System One, we heard virtually no differences in any parameter save the slight image shimmer noted previously with the analog record. Compared with our previous results on the CD versus the D-to-D, the clarity difference of magnitude 3+ had somehow disappeared! It was remarkable how similar the Rock/Triplanar/Alpha 2 combination and Meridian CD player sounded.

We think it plausible that the CD did not exhibit a 3+ improvement in clarity over the D-to-D (as we had heard with the previous three Sheffield recordings) because the Houston master tape was recorded nine years ago. Tape degradation from prolonged storage and improvements in recording equipment over this period alone could account for the difference. Thus, it should not be surprising that the original D-to-D version sounded clearer than the nine-year-old master.

Conclusions:

We started the listening experiments with what we hoped was no strong bias in favor of either CD or analog record. At the end of the testing, we were forced to conclude that, using the equipment at our disposal, the CD was not only a more accurate facsimile of a first-generation copy of the master tape, but was actually preferable to the best analog records available.

The validity of our conclusions depends entirely upon the intrinsic sound quality of the Rock/Triplanar combination. Before choosing this turntable for our listening tests, we compared it with a number of other high-quality 'tables. The most conclusive of these comparisons was one in which a meticulously set-up Goldmund Studio/T38 was matched against the Rock, using the same cartridge. The comparison was conducted by recording a representative selection of musical pieces from one turntable, remounting the same cartridge on the second turntable, repeating the recording, and comparing the two resulting tapes at leisure. Aside from some tonal differences, the Rock proved to be superior in detail, stage width, and overtone recovery (timbre) when compared with the Goldmund.

Conceptually, what we compared was the sound of the CD player versus the sound of the turntable as played through a common set of high-quality electronics. Some might argue that if we had only used tube or some other brand of solid-state electronics, the results might have been different. We think this is unlikely if all stages of amplification are of equal quality. We also believe that only relative differences between sources were important in leading to our conclusions. Of course, the CD is at line level, whereas the MC cartridge is at a 5000-fold lower level. To assess the effect of this factor on our conclusions, we employed a strain-gauge cartridge that actually had greater output than the CD player. Qualitatively, our results were not changed under these circumstances. Therefore, we feel our conclusions are independent of the amplification used and reflect the relative merit of the sources themselves.

Without question, first-generation CD players were not as good as audiophile-grade turntables. In our judgment, they suffered deficiencies in imaging and recovery of low-level ambient and timbral information, producing a two-dimensional, harmonically thin and overbright sound. Judgments made with these first-generation players are no longer valid, and should not be used to condemn the entire digital scene. Perusal of the analog circuitry of even the best CD players indicates that con-
siderable improvement in sound quality is still possible when discrete circuitry, separate power supplies, and the best parts are incorporated.\(^7\).

We respect the integrity of many of the critics of digital in the underground press; our study would be incomplete without some explanation of why our conclusions differ from theirs. In comparing a high-quality CD player (i.e., the Meridian) with a number of the best turntable systems, we feel that two sonic differences consistently emerge which might form the basis of the analog/digital controversy.

In the first instance, one typically hears a pleasing amount of extra bass emphasis with analog records; this adds warmth and greater "body" to a male vocalist, for example. Secondly, these turntables also add varying amounts of what could be called "sheen," "glow," or "bloom" to voices and instruments. It is only by reference to some additional arbitrating standard (a copy of the master tape) that we were able to tell that these admittedly euphonic characteristics are actually added by various turntable resonances. The analog/digital controversy therefore stems, we believe, from the conflict between trading certain euphonic colorations for greater transparency and detail. There will always be those audiophiles who consciously or unconsciously select equipment that compensates for what they dislike about many commercial recordings.

By choosing a turntable/tonearm combination which specifically addresses arm/cartridge resonances and suppresses microvibrations at the stylus/groove interface, we gained a substantial increase in inner detailing and image focus compared to other analog playback systems. We lost a significant bass coloration (no measurable vertical arm/cartridge resonance) and virtually eliminated a false sense of "sheen." The resulting turntable sound approached the sonic characteristics of the CD and the prerecorded tape. In the case of the Thelma Houston recording, the sound of the AR was virtually identical to that of the CD. These results indicate that the extra bass and the "sheen" or "bloom" heard on other phono playback combinations derive not from the program material, but from the turntable. We strongly believe that the characteristic sound of analog playback equipment pronounced accurate by the digital detractors includes many euphonic colorations to which we have become accustomed. As improvements in analog playback equipment reduce these colorations, it is not surprising to see CD and analog sources approach each other sonically.

Our results indicate that, for average listeners who do not own state-of-the-art audio equipment, a well-chosen compact disc player will provide a much more satisfying home musical experience than will a comparably priced turntable and cartridge. We suggest to perfectionist audiophiles that they go to the trouble of repeating our experiment. Like us, they may be surprised at the outcome.

Addendum

Since these tests were completed, major improvements in compact disc reproduction have been achieved. We have critically auditioned a number of newer machines, including the Meridian MCD Pro, PS Audio CD-1, Denon DCA 1500, ADS CD3, and a Musical Concepts-modified Magnavox 2041. With the best one of these players, we think that CD reproduction has now progressed well beyond the best offered by analog turntables. In our view, it won't be long before the claim of analog superiority will be untenable. According to John Hillig of Musical Concepts and Robert Heblim of Denon, the end point of digital disc reproduction has not yet been reached.\(^8\) When perfectionist techniques are applied to professional digital recorders and mixers (as has been done with Reference Recordings' \textit{L'Histoire Du Soldat}), we can anticipate a level of reproduction quality that rivals what is heard in live concert.

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\(^7\) We recently had the opportunity to evaluate a current version of the Meridian Pro MCD in which such improvements have been incorporated. The increase in realism in the already excellent machine used here was startling, literally raising the hair on the back of the neck!

\(^8\) This could also be concluded simply from the rapidity of progress being made. Even with a mature technology like analog record playback, significant progress has been made in the last five years. Digital, however, has been making that much progress every six months.

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While looking through my old copies of *Stereophile*, I read Bill Sommerwerck’s "Zen and the Science of Electrostatic Speaker Operation" (Vol. 8, No. 3). Had I noticed it sooner, you would have received this letter within days of that issue’s release. Mr. Sommerwerck says he is an electrical engineer, and gives an "elegant explanation of electrostatic speaker operation." Elegant it may be; correct it is not. It is also much more complicated than the correct explanation.

Mr. Sommerwerck explains the concept of the time constant, and how a capacitor (in this case, the speaker) cannot charge up instantaneously. He says an electrostat’s time constant is so long that the audio signal cannot significantly vary the charge on the speaker’s "plates," and that in accordance with the equation $Q = CV$, the electrostat changes its capacitance (i.e., moves its diaphragm) to compensate for the changing signal. "V" in the equation is the applied voltage at a capacitor’s plates, not the voltage applied to the resistive-capacitive network that
determines the time constant. In his example, Mr. Sommerwerck ignores the fact that the signal, just like the polarizing voltage, is subject to the effect of the time constant; therefore, if "Q" cannot change, neither can "V".

Mr. Sommerwerck describes an electrostat as "a big capacitor"; I hope he means physically large. I measured the capacitance of the midrange elements of the Infinity Servo-Static I, and found the total capacitance to be about 1000 picofarads. The time constant would be measured in microseconds.

Another problem, if we were to ignore the fact that "V" cannot change without "Q" following it, is that force is needed to move the diaphragm. \( Q = CV \) does not provide a source for this force. It is easier for "V" and "Q" to follow one another than for the capacitance to change; nature tends to avoid the hard way.

The final flaw in Mr. Sommerwerck's explanation is that the DC polarizing voltage is a (hopefully) steady voltage in an electrostat, and is not modulated by the audio (which is applied through a step-up transformer to the "plates," which are more accurately grids).

That a real electrostat's diaphragm is driven into motion is an application of Coulomb's Law, which states that the electric force between two point charges is directly proportional to the product of the two charges, and inversely proportional to the square of the distance between them. Another law governing electrostat operation is that the electric force between parallel plates is uniform; hence the linearity of electrostats.

Now for the "diagram that purports to show how they work," shown in cross-section. You will note that the large resistor mentioned by Mr. Sommerwerck is not in the signal path.

Let us assume that, at a given moment, the input is such that input 1 is positive. This will cause grid 1 to become positive, pushing the positively charged diaphragm down, and grid 2 to become negative, pulling the diaphragm down. If input 1 were negative, the charges on the grids, and thus the force on the diaphragm, would reverse.

An interesting paradox is that one oft-cited advantage of electrostats is the elimination of "breakup" due to the fact that their drive is uniform. In reality, however, the portion of the diaphragm that emits sound is not, due to holes in the grid, driven at all.

I hope that, in the future, Mr. Sommerwerck's degree will not stand in the way of his looking at his elementary physics books.

**BS Responds:**

Something cannot be both elegant and incorrect—except, perhaps, a diamond necklace worn with blue jeans. The explanation I gave in Volume 8, Number 3 is basically correct.

In nature, most physical systems are reversible. Once you see how constant-charge operation explains condenser microphones, it's but a short step to apply the rule in reverse to electrostatic loudspeakers (ESLs). Although this may not give insight into the details of ESL operation, it does connect the operation of two "different" devices by use of the same principle. That is elegance.

The point of the piece was to suggest that the universe works as a system. Whether or not you accept the idea of a noncausal universe, I wanted to show how electrostatic speaker operation could be explained by invoking mathematical principles, rather than appealing to (seemingly physical) causes and effects. This is not a merely theoretical consideration: there are real-world effects that appear to have no cause.

I'm aware that in \( Q = CV \), \( V \) is the capacitor plate voltage. The catch is that the audio does modulate the bias. (If this isn't clear, mentally replace the two halves of the secondary with two identical voltage sources representing the signal.) Traditional explanations do not clearly show how changing the bias voltage moves the diaphragm.

Another problem with standard explanations (such as the one on p. 73 of Edgar
Villchur’s Reproduction of Sound) is that they show the audio signal as an isolated voltage. Such a voltage will attract and repel the diaphragm. But in real speakers, the stators connect to one side of the HV supply.

In trying to clarify the situation, Mr. Rauchwerger made some mistakes of his own. For constant-charge operation, a full-range ESL should have a time constant of about one second. The bias resistor in an Acoustat power supply is 500 megohms, which would need 2000 pF for that time constant. Three or four Acoustat panels have at least that much capacitance.

Although still not fully correct, Mr. Rauchwerger’s explanation is far and away the least bad I’ve seen. I appreciate the time and trouble he took in writing it out. In thinking through his letter and discussing the matter with Acoustat’s Jim Strickland, I’ve come up with an explanation of ESL operation that satisfies me. I hope our readers find it equally satisfying.

The Ultimate, No-Kidding, Explanation of Electrostatic Speaker Operation

Imagine two parallel metal plates floating in space. They form a capacitor. Suppose this capacitor has equal and opposite charges on its plates. If nothing hinders their movement, the mutual attraction of unlike charges will cause the plates to start moving toward each other.

Now imagine three equally spaced plates, the inner having a positive charge, the outer two negative. This arrangement corresponds to a push-pull electrostatic, with the inner plate the diaphragm, and the outer plates the stators (so-called ‘cuz they don’t move).

If all three plates have the same charge, and are evenly spaced, the attractive forces on the middle plate (diaphragm) will exactly balance out. The diaphragm has no tendency to move, even if it’s free to do so—exactly analogous to the hungry ass standing midway between two bales of hay.

The three plates can be thought of as one capacitor, made of two capacitors back-to-back. The audio signal pumps charge back and forth between the two outer plates. (Look at the schematic and think about what’s going on.) The large resistor in series with the diaphragm prevents any rapid movement of charge to or from it, so it has no effect on the overall exchange of charge.

When a signal is applied, at any instant one of the plates will be driven more negative (increasing its charge), and the other more positive (decreasing its charge). The diaphragm has a fixed positive charge. It will therefore feel a stronger attractive force from the plate with the increased negative charge, and a reduced attractive force from the plate with the reduced negative charge. Obviously, it will move toward the first plate. QED.

Note that it is incorrect to say that the applied voltage attracts and repels the diaphragm. What actually happens is that the signal modulates the charge on the stators, which unbalances the attractive forces acting on the diaphragm. It is this imbalance which moves the diaphragm, and not the applied voltage.

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—Anthony H. Cordesman, Stereophile, Volume 8, No. 7

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Perreaux & GNP on High End Reliability

Alan Shebre of GNP Showcase talks with Anthony Federici of Perreaux International.

Anthony: There is a widespread myth that high-end audio is not as reliable as mass produced audio equipment because it’s at the leading edge of technology. This myth seems to be perpetuated by manufacturers of poorly constructed and engineered components. The consumer is then expected to accept either inferior performance or reliability problems.

Alan: I know what you mean. There are advanced high performance components that are extremely reliable. Just as there are mass market components with mediocre sonic performance and poor reliability. Reliability seems to hold no allegiance to either price or performance.

Anthony: The high-end reliability problems also seem to come from small manufacturers who have not properly tested the product in the real world and from foreign manufacturers who find different conditions here in the U.S. I know, because a few years ago, Perreaux’s 2150B power amplifier was a victim of the later.

Alan: Boy do I remember that! As a retailer, it’s a major pain to carry a product when there are reliability problems. When we were having problems with the 2150B, you personally assured us that solutions were at hand. And besides, Perreaux’s other components were extremely reliable.

Anthony: I was trusting Peter Perreaux. Knowing the man, I was confident of his ability and that he had properly engineered his audio products. As it turned out, the problem was that some U.S. power companies have very high voltages at certain periods. We realized this when a radio station using a Perreaux amp had charts showing long periods of over 150 volts AC instead of 110 volts! This can easily burn out components. Once we knew the cause, only a very simple modification was needed.

Alan: The most important thing is that you stood behind the 5-year warranty and fixed it at no charge to the consumer, even though it wasn’t a manufacturer defect! Most major manufacturers don’t honor the warranty if damage occurs from high AC voltages. Just ask anybody in the computer industry.

I trusted you, you didn’t let us down. Sticking with Perreaux was a good decision for GNP.

Anthony: If a manufacturer that I’m standing behind has reliability problems, then my reputation can be damaged with dealers and distributors. Your reputation as a dealer can be damaged. I know very well that the customers get angry with you and blame you for selling unreliable products. If a product should fail, the repair must be made rapidly or, again, you get the heat.

Alan: There is nothing more upsetting than a manufacturer who turns his back on a product after it’s sold. High-end audio’s reputation suffers because of these manufacturers. That hurts sales—for both of us. The consumer gets hurt because he thinks excellent sound quality comes at the expense of poor reliability—and in many cases, makes the wrong buying decisions. The people standing behind the product are much more important than the size of the company. It was nice talking to you Anthony. Until next time...

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At one time there were five competing AM stereo systems: Belar, Magnavox, Harris, Motorola, and Kahn. The FCC approved the Magnavox system, then rescinded their decision when deluged with technical information that they had chosen the wrong system. In order to avoid more technical figures, they decided to let the marketplace decide. Two competing systems remain: Motorola because the company has the manufacturing and economic clout, and Kahn because Leonard Kahn has persistence. Actually, the test results of all five AM stereo systems at WTOP in Washington, DC indicate that the Belar system had the lowest distortion (1.3 % max.). As we all know, good guys sometimes finish last.

The Motorola system is called C-QUAM ("Compatible Quadrature Modulation"). It contains the L+R information on the usual AM carrier, and can be received in mono on non-stereo radios. The L-R information is simultaneously transmitted as an angular modulated wave (a type of FM), at the same carrier frequency as the L+R. A pilot tone of 25 Hz is included in the L-R modulation for the receiver to sense a stereo condition. The 25-Hz signal needs to be removed in the recovered audio to avoid infrasonic problems.

In the Kahn system, the R channel is transmitted in the upper sidebands, the L in the lower sidebands. Because both sides of the carrier contain complete L+R information, the signal is compatible with mono radios regardless of the polarity of the half-wave detector normally used. A 15 Hz pilot tone is used, appearing as an out-of-phase component transmitted in both channels. The pilot tone can be recovered from either channel to activate the stereo decoder and still not appear in the L or R audio because of the 180 ° phase difference and resulting cancellation.

The merits of AM stereo: From the brief descriptions of the Motorola and Kahn systems, you will notice that there is no 38 kHz or 19 kHz subcarrier to cause beats or high-frequency intermodulation distortion, as in conventional FM. Stereo AM stations normally use some high-frequency enhancement to make up for the lousy response of most receivers. Also, the L-R channel of the Motorola system requires some preemphasis. However, in all cases there is a sharp rise in high-frequency response, followed by a sharp drop to contain most of the sideband energy within the 10 kHz spacing of AM stations. (WQXR is the only station I know of that uses very little, if any, treble boost.) At least there is nothing like the linear increase FM has, starting at 1 kHz and rising to +16 dB at 15 kHz, and, after that, straight to the moon. As a result, AM stereo can sound smoother, and easier to listen to, than most high-frequency grudge-ridden FM stations burdened by the required preemphasis curve, or the many CDs that suffer from high frequency garbage.

Before debunking AM stereo, realize that you have been listening to one-half AM stereo all the time without realizing it. The conventional 38 kHz subcarrier used for the L-R information is suppressed-carrier AM-modulated on all US FM stations. The laws of physics indicate that it is best not to mix AM and FM systems, which leaves us Kahn's all-AM system as holding the greatest promise of producing the true golden tones of high fidelity over the airwaves.
**Communication Breakdown**

The other day I overheard a dealer tell a customer that if he found the "documentation" for some of his just-bought audio equipment unclear, he, the dealer, stood ready to answer any questions that might arise. For me, that raises two matters worth discussing: When did audio instruction manuals become "documents," and more important, why did the dealer expect the documents/manuals to be unclear? The use of the term "documentation" is, of course, simply another minor example of the new kind of jargon that puts stumbling blocks in the path of communication. Lord knows, audio technology is difficult enough to explain without injecting computerese.

Because the technology is both difficult to understand and constantly evolving, one might imagine that manufacturers would make special efforts to provide clearly written, well-illustrated instruction manuals. A clear, attractive, and interesting manual not only enhances the customer's pride of ownership and satisfaction with his buying decision, but could do much to eliminate those post-sale phone calls from customers confused about one or more of the operating features on their new equipment.

**The Source of the Problem**

Of course, there are some manufacturers whose instructions are all that any one could ask. But why are so many manuals so incomplete, so strangely worded, and, in general, so inadequate? Almost all of the problems occur because most audio equipment sold in the U.S. is not only made, but also written about in the Orient. (I say almost all, because one U.S. manufacturer of a sophisticated and complex preamplifier provided for over a year an "instruction manual" that consisted of a thick photo-offset copy of a typed transcript of what appeared to be someone's freely associated thoughts on the product.)

But even with products sourced overseas, aren't their manuals written, or even edited, by someone with at least a little talent for communicating technical instructions in English to a non-technical audience? Sometimes, but certainly not always. I suspect that many importing companies are so pleased to get any printed material along with the products that they are not about to complain about such "trivial" matters as clarity, accuracy, and prose style! Here are two illustrative personal anecdotes:

Case 1. I once received a frantic call from a sales manager surrounded by samples of his new line. They had arrived that day completely devoid of any descriptive literature. His problem was that he needed to send printed material out to his sales representatives fast, but wasn't sure that he fully understood the features and characteristics of the products the Japanese had chosen to ship him. My job, if I cared to accept it, was to go over the equipment and dictate into a recorder as much as I could deduce about each piece.

That was an extreme case, but it's not at
all uncommon for a U.S. subsidiary or importer (or advertising agency) to be presented with a line-up of new products said to have “special design features” that, at best, are far from self-explanatory, and, at worst, make no sense at all. Which brings us to:

Case 2. I was asked by the U.S. sales manager of a respected high-end Japanese line to produce a technical “white paper” explaining a new and highly touted circuit used in their new amplifiers. (Let’s call it “Gamma-Plus.”) After studying the schematics and the semi-English technical gobbledygook that purported to describe the Gamma-Plus circuit and its purpose, I generated about 1000 words of plausible explanation and justification. I ran them by the company’s U.S. technical consultant, who admitted to being no wiser than I about the absolute technical truth of the matter, but who thought my guesses were as good as any he had yet heard.

I submitted my white paper and it became part of the press kit to be given out at the press conference—which I was scheduled to attend—where the Japanese president and chief engineer would introduce the new line. During the question and answer part of the conference I tried to get an authoritative explanation of Gamma-Plus from the company’s chief engineer. He assured me that there was an “excellent explanation in press kit” —thus bringing the matter full circle. Perhaps needless to say, I’m still not sure what Gamma-Plus was supposed to accomplish—but maybe the manufacturer wasn’t either.

A Priority Situation

I could provide additional examples of the very low priority many companies place on clear, accurate, and timely communications. (Their high priority is usually on promoting their annual special technical gimmick, such as Gamma-Plus. Next year, Gamma-Plus is likely to be forgotten in favor of, say, a revolutionary Lateral Feedback circuit that prevents signal side-slip, a newly discovered source of quasi-audible distortion.) And it isn’t just instruction manuals that suffer from the original manufacturers’ skewed priorities. Much of the illiteracy and silliness seen in the ads and promotional literature arise from the same problem.

It seems self-evident that every time a hi-fi manufacturer releases a product with an unclear and/or illiterate instruction manual, he does himself, and the entire audio industry, a disservice. The equipment is obviously designed by talented professionals—why do the manuals so often appear to be the work of incompetent amateurs?

There’s no single answer to that question. Incompetent engineers don’t last long, but incompetent technical copywriters apparently go on forever. Too many overseas manufacturers have on-staff technical writers who, on the one hand, are overly dependent on The Concise Japanese-English Dictionary, and on the other hand, are too prose-proud to accept criticism. The U.S. subsidiaries are then stuck with whatever printed material their parent companies supply, because they frequently lack the budget, the clout, or the know-how to produce their own manuals.

Possible Solution

If anyone thinks I’m exaggerating the instruction manual problem, all they need do is interview a batch of customers who have recently bought new and/or more complex components, or read the mail received by any of the major hi-fi magazines. Much of this mail is from readers seeking information on matters that should have been explained in the literature that accompanied their new equipment. It’s obvious that overseas manufacturers (and some from right here at home) should pay closer attention to their instruction manuals. Perhaps the only way that will come about is if they are deluged by consumer complaints. If a newly bought audio/video component seems impossible to hook up with the instructions provided, don’t assume that you are stupid. The real explanation may well be that the manufacturer hasn’t done his job properly.
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Then, in 1982, Magnepan received a patent on a true, line-source ribbon speaker. The combination of these two technologies, as shown above in the Magneplanar MG-Illa, reconfirms Magnepan's position as innovators of audio products.

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Department A
You've probably opened to this page to find out what's cooking in the old country. I'm not sure what to tell you. To tell the truth, I don't get out much these days. If I step outside the front door, I'm in danger of being irradiated or shot in the foot by a terrorist. If I have to visit anyone or go to the shops, I always go Eil Al.

As for the wonderful world of audio, things are unsettled right now, but let's get the ball rolling with this burning question: With what kind of product do you most associate the British hi-fi industry? A pound to a penny the answer is loudspeakers, and certainly, in terms of value, loudspeakers are Britain's major audio export.

But we only know this because we share a common interest in high-quality audio, and who makes what. What about the legendary Man in the Street? Better still, what about a spokesman for the Confederation of British Industry who went on radio a few months ago with the comment that "I advocate buying British—but of course you can't buy a British hi-fi."? The CBI is no less than the main body of experts representing the U.K. manufacturing industry.

The simple truth is that the British hi-fi scene is in a mess, yet very few people seem aware of the fact. In the period between ten and five years ago, Linn, Naim, Rega, and a few others galvanized a select group of dealers into providing unprecedented levels of service in the form of advice, demonstration facilities, set-up, and installations.

The result has been a repository of skills dotted around the country in an initially cozy, but increasingly ideologically blinkered, group of dealers. As the situation has developed, many dealers have become lazier and less able to adapt to changing circumstances. In classic evolutionary fashion, inability to adapt means severe danger when the rug is pulled from under the feet—which is what's happening.

At the moment, we're in the wailing-and-gnashing-of-teeth stage. Many of the dealers I speak of are suddenly finding people no longer falling all over themselves to buy their wares. They're forced to actually fight for a living, like the rest of the world, and, in many cases, the adaptation isn't proving easy.

As the old order slowly fades, the new makes ready to take its place. I can feel a change coming—a second renaissance comparable to the one ushered in by those promoting the turntable (the "source" as the most important item in a hi-fi system). I cannot quite put a finger on exactly how and when it will happen, or what the consequences will be, but it will certainly be led by a new bunch of young designers, or designers who've been in the wilderness for a long time. There are a number of these—designers like Tim de Paravicini (EAR) and Denis Morecroft (DNM), and companies with strong ideas about where the future lies and the right way of doing things. Audio Innovations (more about them in the future) is one, as is Roksan, whose Xerxes turntable was discussed in Vol. 9, No. 3. Then there are the Anthony Michaelsons (Musical Fidelity) and Farad Azimas (Mission) of this world, who are driven in a different way, and whose products combine sonics, value, and professional presentation in a unique way. They, and people like them, will increasingly form the bedrock of the industry's middle ground.

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standards, with compact disc forcing a reassessment of priorities, even though it demonstrably does not set the pace. The omens here are good. Some of the new names (Roksan is an excellent example) are showing the old ones a clean set of sonic heels. The way has been shown particularly by the stow and steadily growing acceptance of the better imported esoterica, in particular from the U.S.A. Ricardo Fransassovicci of Absolute Sounds, whose name has appeared in these pages before, played a seminal role in breaking down the barriers of our home-grown xenophobes.

This revolution is due in part to the fact that the audiophile market has shrunk to historically small proportions. To give just one example, the market for Snell loudspeakers is smaller in unit terms here than in Denmark, which has about one-tenth our population (we share the same distributor). Although Snell may be an extreme example, it is not an isolated one. As a general point, most U.K. high-end manufacturers sell at least 50% of their wares on the export market, which is as much an indication of the flatness of the market here as it is a demonstration of their marketing prowess abroad.

Meanwhile, some prefer to fiddle while Rome burns. To give just one example, the BADA (British Audio Dealers Association), in cooperation with the FBA (Federation of British Audio), have just completed an expensive national press campaign which featured an advert that looked (as one industry figure quipped) like an income tax return. Needless to say, it flopped. Hi-Fi Review, Chris Frankland's new magazine and a successor to the now-defunct Flat Response (see this column, passim) represents the last gasp of the tired old order. Even Chris, bless his little cotton socks, has been forced into bending just perceptibly away from his old dogma: he actually criticized the Linn amp in a recent review.

But let's get back to the question posed earlier concerning what the British audio industry is best known for: loudspeakers. Although Britain may be a successful loudspeaker maker, we very seldom set the technological pace. The best that can be said is that there are a number of technically very interesting British loudspeakers that almost, but don't quite, deliver the goods. Even our commercial expertise is cast in a different light by certain underlying facts: the majority of drive units in use in "British" loudspeakers come from Denmark, France, and Japan—Seas, Peerless, Audax, and Tomagen amongst them. I also understand that we are net importers of loudspeakers—and so, incidentally, is the U.S., which certainly counts itself as a loudspeaker manufacturing country. At the last count, the top brand of loudspeakers in the States was—no kidding—Fisher. You know, Fisher of the House of Sanyo. Not the Fisher of years ago.

More important than this is that although high-end speaker manufacturers maintain a technological prowess denied even Fisher, most innovative drive-unit designs come from the likes of Apogee and Magnepan, and ditto for enclosure technology (courtesy Snell and others). Meanwhile, Britain continues to make arguably the finest compact disc players in the world. And we did give the world carpet-piercing spikes.

The KEF Reference Series R107

This brings me neatly around to the KEF reference series R107, an up-market model to supplement the highly successful 104/2 and replace the 105. I've had a week or two to play with a pair; it's one of the few exceptions to the gloomy comments above. I've no idea what the price will be on your side of the Atlantic: here it sells for just a shade under £2000. If you know the KEF 105 (or the B&W 801), the appearance of the 107R will be no surprise, with its molded head containing tweeter, midrange, and crossover atop a big and surprisingly elegant box, which does the oomph impersonations.

I understand U.S. dealer reaction is pretty unanimously positive. David Inman, their marketing guy and a real musicophile, says that the comments come in the following order: it's British (with all that means in terms of civilized sound), it goes loud (which means it really isn't all that British), and it doesn't break (that clinches it—it's definitely not one of ours, after all). On the other hand, it doesn't follow U.S. convention on input arrangements. It's designed strictly for use with one power amplifier—
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MIRAGE ACOUSTICS
there are no split inputs for bi-amping.

There's an intriguing item of technology supplied with the 107, called the K-UBE (KEF Universal Bass Equalizer). It's dedicated to the 107, so it ain't universal, and as for being an equalizer, well, it isn't that either. Granted, there is a control that shelves the whole bass up and down a bit, but it's the other two controls that do the important work. One is used to alter the cutoff point from 50Hz down to an exceptional-for-the-size 18 Hz; the other varies the Q of the resonance between 0.3 (overdamped) through 0.5 (maximally damped) to 0.7 (under-damped, resulting in bass ringing and fairly severe pitch inaccuracies with some program material).

I must note in passing that the K-UBE, an active device that plugs into your amplifier's tape monitor loop, doesn't seem to work quite as claimed. OK, it is possible to produce some very satisfying results that I'll come to shortly, but there remains a residue of slackness in the infra-bass that I could not completely tune out, no matter how I adjusted the controls or the speaker's position and orientation.

Nevertheless, I was impressed by the 107 at first hearing, and my respect has grown as I have come to know and mentally filter out the remaining idiosyncrasies—there is a learning curve. I was consistently surprised by the colorfulness and excellent definition of individual instruments with this loudspeaker. Spatially, too, the KEF is as good as the best. When well set up, it actually achieves something like the ideal, with instruments properly separated and easy to locate in depth and width, and a sound that is detached from the boxes, with a tangible sense of scale and the recording venue's acoustic.

The 107 also has tremendous consistency, except at the very lowest frequencies. Nothing stands out, nothing jars—the 107 has a wholesomeness rare at any price. It offers a richly variegated range of tonal colors, and combines this with a genuinely potent dynamic range. Record surface noise is superbly repressed. The KEF is as good at this as any other loudspeaker I can remember. Add the tonality to the spatial, stir in the dynamic ability, and you have one of the few loudspeakers that can play an orchestra without making it sound like an over-ripe squeeze box. I can only complain about one feature: an audible lack of very fine, low-level detail. The loss is not severe, but is enough to remove a certain edge of real-life tension and credibility from the music. The KEFs can sound just a mite too comfortable to be true and—and this is to be regretted—I suspect the resolution of the midrange/tweeter arrangement falls behind the best modern standards.

Adding bass via the extension control of the K-UBE has a largely unexpected range of effects. It infuses atmosphere, tonal color, and dynamic impact into the sound, without actually doing much to its weight or balance (this is more a property of loudspeakers that ring, as can be demonstrated by increasing system Q). It forces me to reassess the importance of good, extended bass in hi-fi systems—but that is another story.

To conclude, maximum output is around 112 dB (claimed), and sensitivity equivalent to a K-UBE-less 8-ohm loudspeaker (the KEF is a nonreactive 4 ohms) of about 89 dB/W/m. Give it a whirl if you fancy a rare and sophisticated combination of power, practicality, wide dynamic range, and LF extension, which even works in small rooms.

Readers may be interested to know that this the first of these articles to have been transmitted computer-to-computer, via the magic of a satellite in geosynchronous orbit somewhere above the Atlantic—incidentally adding some 72,000 miles to the journey. The method of transmission is almost, but not quite, instantaneous. The signal actually propagates at a large percentage of the speed of light, but due to the beneficial effects of time dilation, the copy—or a copy of it—arrives on the editor's desk immediately prior to being dispatched from the U.K. Or will do, since it hasn't been sent yet. And as a you can see the whole ((proces is . . . and 5Xcomplet and ly!)

1 This is putting it mildly. The story of receiving this transmission would fill an entire Stereophile article. Suffice it to say that it would have been faster had Alvin dictated the entire article while I transcribed it in mud with my finger (as it was I took 20% of it by hand over the phone).

—LA

Stereophile 83

I was unimpressed with the first Alpha 2 cartridge I auditioned, because of its (to me) overly sweet high end and somewhat unexciting character (see review in Vol. 7, No. 8). When we forwarded my sample to AHC for a listen, measurements he ran suggested it had been defective. A second sample he received performed splendidly.

The problem with my cartridge was later verified by Monster Cable, who claimed it had become "magnetized." How a device that uses a powerful magnet can become magnetized escapes me; I also fail to understand how extra magnetism could so completely screw up a cartridge's measured frequency response. (The response on my Alpha 2 started to go up at ~khz and was almost 10 dB up at 20!)

Whatever the case may have been, this new Alpha 2 is an entirely different cartridge—so much so, I suspect it may in fact be a redesign. (The cryptic pen scribblings on the box and spec sheet—"Type B HB/1"—would seem to suggest that.) But if my second sample is the same cartridge that other users know as the Alpha 2, I can see what all the fuss is about. This is a gorgeous cartridge!

To begin with, it doesn't have that infernal high-end tip-up that has afflicted almost every MC I have tested. (Come to think of it, the age of the tipped-up MC top may be passing, and good riddance to it. This Alpha 2 is the third MC I have tested that doesn't have it! The others were the Ortofon MC-2000 and the Signet MK440-ML.) Then there's its moderately high output (for an MC) which makes it usable without a step-up (but with suitable loading) into the MM input of most high-quality preamps.

This is one of the very few cartridges I have reviewed that actually requires the
tonearm to slope backwards. Its sound was best overall—cleaner and more spacious—with the arm sloping downwards toward the rear by about 1°. (This may not be the ideal VTA for your system, but it was with mine. The point I'm making is that it is not a cartridge that will want a 5° downtilt toward the front, as have some I've tested recently.)

The Alpha 2 tracks like an Indian scout! Nothing fazes it, from the heaviest bass (the Telarc cannons) to the sharpest, hard percussion transients. The high end is an unalloyed delight: silky smooth, open, and airy, with only the very slightest wispiness to reflect its slightly but smoothly rising high end. It has no tendency to exaggerate surface noise or mistracking; indeed, there is very rarely any evidence of even marginal mistracking from any but the most beat-up discs.

Soundstaging and imaging, too, are superb, as is the cartridge's rendition of depth and perspectives. In fact, this latest version of the Alpha 2 does just about everything as well as any cartridge I have heard. It's no wonder it has been adopted as a de facto standard by a number of manufacturers of other kinds of products. (Audio Research's Bill Johnson practically made our having one a precondition for loaning us some ARC gear!)

Unfortunately, the Alpha 2 is not the ultimate answer to all audiophiles' prayers. As gorgeous as it may sound in a lot of systems, it is not what I would call accurate. That this is true is evidenced by the fact that, when a system is tweaked and balanced out to produce the most natural sound from the Alpha 2, every other program source—open-reel tape, FM, CD—sounds wrong! Balance out the system so instrumental timbres sound right with the average of those other sources, and the Alpha 2 sounds a little laid-back in the brightness range and a little tizzy on top.

As a reviewer who has frequently admitted to preferring euphony to accuracy (from, say, a preamp), I can hardly turn around and condemn the Alpha 2 for sounding more agreeable than accurate. Indeed, if all you ever intend to play is analog discs, and your speaker system is a little too bright and forward, and soft at the extreme top, this may be the ideal cartridge. But if you adopt the Alpha 2 as your reference, be prepared to conclude that all other signal sources have too much upper midrange.

Personally, I don't advise going this way. I prefer to get all signal sources sounding as similar in spectral balance as possible; I then work on the rest of the system to get the maximum attainable musicality. Only when all have been optimized to a common good can one begin to make qualitative comparisons between signal sources. But then, that's only my opinion.

Despite my reservations, most audiophiles are going to love this cartridge, accurate or not. It is about as seductive-sounding as anything you can buy, and if seductive sound isn't the be-all and end-all of high-end audio, it is certainly one way to go—and a rewarding way, at that!

**SIGNET MK440-ML CARTRIDGE**

J. Gordon Holt

Moving-coil cartridge with microline stylus. Frequency response: 5 to 50,000 Hz. Separation: 33 dB at 1 kHz, 25 dB at 10 kHz. Output: 0.1 mV. Recommended tracking force: 1 to 1.6 grams. Weight: 7 grams. Price: $600. MANUFACTURER: Signet, 401 Hudson Dr., Stow, OH 44224.

Since I discovered Ortofon's MC-2000 cartridge a few months ago, I have been searching for another cartridge that approached it in tonal neutrality and trackability, but at a more affordable price and with high enough output to prevent hum problems (which are really a problem on
the Ortofon). The Signet MK440-ML is the closest contender to date.

It costs far less than the Ortofon. (The Ortofon, with its recommended step-up, costs $2000.) The $600 Signet has enough output to be used with any high-quality stepup device, though not enough for use with a preamp by itself (except for the ARC SP-11).

The MK440-ML is a little on the heavy side, and appears to have quite high compliance. (Signet never publishes compliance figures.) And, since I adopted the Well Tempered Arm as my standard, I can no longer measure LF resonance; the viscous damping in the arm suppresses it. (This is not a complaint, by the way; it is strong praise, as it is uncontrolled LF resonance that aggravates such problems as pumping woofer cones and groove hopping on heavy bass signals.) I would estimate the MK440-ML's compliance at around 15, which means it is best used in a low- to medium-mass arm.

The cartridge requires virtually no additional VTA. When first auditioned, with the arm sloping downward toward the front by about 3°, the sound was excessively brilliant and the soundstaging rather narrow: Lowering the back of the arm so the arm tube was parallel with the disc eliminated virtually all the spurious brightness, and opened out the soundstaging to the point where it was judged to be excellent: broad, deep, and spacious, with very tight and stable imaging of specific instruments.

The manufacturer's recommended range of tracking forces is, I believe, a little optimistic. At 1 gram, the MK440-ML was occasionally on the verge of groove-hopping (momentarily losing groove wall contact) during heavy bass passages on several recordings; even at 1.5 grams, it was still unable to negotiate cleanly the cannon shots on Telarc's infamous 1812 disc. It lost groove contact twice (producing a snap), and jumped into the next groove when it hit the last blast. And although the Signet had no trouble negotiating other recordings at that force, I would nonetheless rate its tracking ability as very good rather than excellent.

Contrary to what its measured frequency response would suggest, the MK440-ML's upper midrange is almost perfectly neutral, being neither forward nor laid-back. It sounds noticeably more forward than most other MCs because they tend to be more or less laid-back through the brightness range. Consequently, a system that makes them sound reasonably natural may make the Signet sound intolerably hard. Even with the optimised VTA, the MK440-ML's high end is still subtly hard-sounding through a lot of loudspeakers— not enough to impair its harmonic accuracy, but enough to cause a slight exaggeration of vocal sibilants and surface ticks and pops, as well as mistracking garbage whenever this occurs.

The 440-ML is nevertheless the second most accurate cartridge I have come across: I can recommend it without reservation to anyone who would like, but can't afford to own, an Ortofon MC-2000. The Signet is not, however, what I would characterize as an audiophile's cartridge. In most systems, it does not sound as unctuously rich as most audiophiles want their sound to be, and it does not exaggerate depth or spaciousness. The Signet's forte is accuracy rather than euphony.

The MK440-ML's main appeal is going to be to home music listeners who, like myself, believe that good CD reproduction is as close as we can come at home to duplicating the spectral balance of original sound sources. Tonaly, the MK440-ML makes LPs sound very much like their CD counterparts, which means that if the rest of your system gives you correct tonality from CDs, this Signet cartridge will allow you to get much the same thing from LPs. I like the Signet MK440-ML very much. You may not.

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1 I consider this Stereophile's least relevant test: the Telarc 1812 is unbearable to listen to, tracked correctly or not! It must be the only LP in history with a right-angle record groove as its only justification for rotten music-making.

LA

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SUMIKO VIRTUOSO DTi CARTRIDGE

Steven W. Watkinson

High output moving coil phonograph cartridge. Output: 1.8 mV. Mass: 7.5 g. Compliance: 15 cu. Price: $1200. MANUFACTURER: Sumiko, Inc., P.O. Box 5046, Berkeley, CA 94705. (415) 843-4500

David Fletcher and his co-conspirators at Sumiko have declared war on head-amp manufacturers. First there was the Alchemist, a moderately priced (by high-end standards), high-output MC that equaled or bettered anything in the under-$500 price class (see our reviews in Vol. 7, No. 8).

Now Sumiko has introduced the Virtuoso DTi, the Alchemist's big brother and the first high-output super cartridge. The DTi's performance places it in a small, select group of cartridges that represent the state of the art. In the stratospheric price range where these super cartridges reside, cost is only a tertiary consideration at best, but with top-quality head amps costing up to $1000 or more, the potential savings offered by the DTi's high output are hard to ignore.

In comparison to the distinctive cantilevered body of the Alchemist, the DTi is a rather conventional-looking cartridge—it has a basically rectangular profile with a slightly gaudy gold satin finish. The body is made from a machined aluminum magnesium alloy claimed to (and which I suspect does) provide exceptional rigidity and resistance to resonances. The cantilever is a unique diamond/titanium combination, with a van den Hul type I stylus. Inside the cartridge body, the cantilever is topped off by loops of extremely fine copper wire. The fine wire, in combination with very powerful magnets, allows the DTi to achieve its high output level while maintaining a quickness of response and detail that matches most low output moving coils. The metal alloy body allows the cartridge to be mounted tightly to the headshell, and Allen-head bolts are supplied with that aim in mind.

As surprising as it may seem, all this theory actually seems to work in practice. This is one of the best cartridges on the market, and, in my view, certainly the best not needing a head amp for proper operation. The sound of the DTi is subtly unique. Every super cartridge has excellent overall performance, but each has one or two virtues (such as speed, dynamics, imaging, transparency, etc.) that are quickly noticed upon first hearing, and which distinguish it from merely very good cartridges. The DTi's distinguishing characteristic is not something one immediately hears, but something one immediately realizes he does not hear. On a clean record, the upper-frequency background grunde and noise normally heard simply isn't there. The sound emerges from a near-silent, black velvet background strongly reminiscent of CD. This, combined with an accurate high-frequency balance (yes, that's right—the DTi doesn't have the HF rise that plagues most MC cartridges), gives the DTi the cleanest, most natural top end I've heard in a cartridge. I listened to the DTi using an ET Type II tonearm, the Klyne SK-5 preamp, BEL 2002 amp, and Magnepan Tympani IV speakers. This combination is extremely revealing at the top end, and the DTi sounded cleaner and more detailed in this region than any cartridge I've heard.

The DTi is also very extended, but this is a little deceptive on first hearing. The lack of HF grunde and the absence of the customary top-octave rise make the extreme top end sound a trifle recessed at first. Further listening, however, bore out the DTi's extension to well beyond audible limits.

1 Sumiko's technical information is a little sketchy on just what the purported advantages of a diamond-titanium cantilever are. I suspect this is because the technology was developed by their Japanese jobber, and the details of just how and why it works so well are considered trade secrets. Regardless of why it works, it's hard to fault the result.

2 The compliance and mass of the DTi are well within the normal range, so it should work well with all but the very heaviest or lightest tonearms. I found the best tracking force to be 1.9 grams. As with any type-I van den Hul, the VTA/SRA setting is critical.
Clean and quiet high frequencies aren't the DTi's only strong point. Though not as noticeable as on the top end, the midrange also is very quiet, giving the DTi a "listen-through" transparency matched by very few cartridges. The bass is good, being tight and well extended, but is no better than customary for a top-of-the-line cartridge. In comparison to the cartridges with the best bass performance, the DTi starts, at high levels, to lose a bit of tightness below 40 Hz, and becomes a little sloppy in the bottom octave. As a result, bass drums sometimes exhibit too much boom, and low pipe-organ notes can lack the proper amount of buzz.

The overall tonal balance is excellent, and about as uncolored as any cartridge I've heard. But the DTi does not sound sterile. It is warmer than the likes of the Talisman S and Kiseki Purple Heart Sapphire, but not as lush or romantic as a Koetsu. The DTi also has an uncanny ability to reproduce the natural weight and authority of live music, giving the cartridge a full-bodied character that adds slightly to the sense of warmth without coloring the sound.

Imaging and soundstage presentation are also first rate. The soundstage is very wide, though depth is only about par for a good cartridge. The instrumental blend in the soundstage is most believable, a pleasant change from the phase-shift-induced cardboard cutouts or unrealistic holograms presented by far too many cartridges. The image is stable, and instruments remain in one location regardless of changes in frequency. The DTi also does a commendable job of reproducing the "jump forward" effect that some instruments, such as clarinets, exhibit upon sudden increases in volume. This is a tricky trait to reproduce properly. Only certain instruments—principally woodwinds and brass, whose primaries are in the mid to upper midrange—should exhibit this characteristic to any significant degree; the closer an instrument is miked, the more pronounced the effect should be. Far too many cartridges exaggerate this phenomenon, and in the process cause a phase shift that wrecks the image.

"Musicality" means different things to different people. Unfortunately, for many it has acquired a negative connotation, implying a warm or bloated lower midrange accompanied by a moderate amount of low even-order harmonics. The DTi's musicality, on the other hand, stems from its excellent tonal and harmonic accuracy. To put it simply, it gets the notes and the relationships between them right.

The DTi is not without weaknesses, however. First, the output level, while adequate for most preamps, isn't exactly overpowering. I suspect there could be problems with some low-gain solid-state preamps, particularly when used with amps that have a relatively low input sensitivity. While I didn't encounter any difficulty in this regard, I did have to set the Klyne SK-5 to its highest line-stage gain level. The other criticism I have of the DTi is its speed. As I said above, the DTi is as fast as most low-output MCs—fast enough that its shortcomings in this area go virtually unnoticed on tube equipment and dynamic cone speakers. But with top-quality solid-state gear, and electrostatic or planar speakers, the difference in speed between the DTi and the best low-output MCs becomes noticeable. As a result, the DTi is missing the ability to resolve the nth degree of detail—such as how close the violin soloist shaved the morning of the recording.

I also have a few minor bitches about the DTi. For reasons I don't pretend to understand, the stylus requires frequent cleaning, seeming to attract dust and crud from the most pristine of records. And despite (or perhaps because of) its gold satin finish, the DTi's looks are hopelessly mundane. It just doesn't have the exotic appearance one expects of a $1200 super cartridge—no rare wood or unpronounceable semiprecious stone body to spice things up and impress fellow audiophiles.

But the final verdict on the DTi remains most favorable. This is a cartridge with enchanting transparency, and harmonic and tonal accuracy and detail as good as any I've heard. I have no doubts that it is the best high-output MC on the market, and one of the best cartridges available regardless of type or price.
A DIRECT COMPARISON OF TWO MICRO-RIDGE CARTRIDGES:
THE DYNAVECTOR 23RS MR AND THE SIGNET TK10ML-II

Signet TK10ML-II Pickup


So it was with great surprise that I auditioned the original TK10ML. Its excessive compliance (for a cartridge of such mass) had it bobbing like crazy in just about any arm, including Signet's. The high compliance lowered the arm/pickup resonance so much that an inordinate amount of subsonic junk came off the record; this was especially noticeable when I took a response curve. Its "ping-pong" imaging (left/right, rather than a smooth spread) was another serious flaw, and my sample received a highly negative, though unpublished, review.1 Despite the commercial success of the TK10ML, it seems that Signet listened to my (and others') complaints, and will soon announce the series II. (As I edit this, towards the end of January, the II has not been officially released: only the original version appeared.)

1 BS's review went unpublished because JGH had already pointed out the cartridge's significant flaws (though he liked the overall sound quite a bit more than BS did), and Signet asked to wait to publish BS's review until he'd received this "II" version.

I have an ingrained prejudice toward Signet products. The MK111E MC pickup had a seductively romantic midrange that I still miss when playing certain records, the original Signet MM pickups were extraordinarily clean-sounding, and the TK33 headphones are still among the best available.
appears in February's *SR Buying Guide.*

It’s no surprise that the compliance has been lowered. Using the time-honored “push it with your finger” test, I was able to precisely determine that it’s almost exactly half (give or take 29.4%) that of the original. In short, the TK10ML-II handles moderate warps without going into a dither, and you can even jump around a bit without upsetting things.

The imaging is also improved: the sound now spreads evenly between the speakers. Unfortunately, there is still a rather bad upper-midrange suckout (see curves). (I disagree with Gordon here: Upper Midrange Suckout, that great crippler of cartridges, has been a problem with both MC and MM pickups for decades.) With lower-mass cantilevers and higher-output magnets, this problem should have disappeared several years ago. Why it remains is a mystery.

**Dynavector Karat 23RS MR Cartridge**


As with the Signet TK10ML II, the Dynavector 23RS MR has what is generically termed a “microlinear” stylus. Although having an overall profile similar to a conventional elliptical tip, the edges of these new styli are so trimmed that a very narrow ridge of diamond contacts the groove wall along the full height of the stylus. Besides the obvious advantage of a narrow scanning radius (spread over a large area to prevent excessively high pressure), this design supposedly maintains its shape far longer than previous styli.

A comparison of the 23 MR and the Signet TK10ML is especially interesting. With nominally the same stylus, sonic differences are mostly due to differences in cantilever length and material, and to the different generating systems (moving coil for Dynavector, moving magnet for Signet). The retail prices are roughly equivalent, and since more and more preamps have integral MC amplification, the “hidden” cost of an MC pickup is removed, allowing fair comparison of these two cartridges.

**The Comparison**

Both pickups were reviewed in a Signet XK-50 arm on the Lux PD-121 'table. I have the Well Tempered Arm on a VPI HW-19/II, a far better-sounding combo, but one with which it is a real pain in the wasoo to swap and realign pickups. In the 10 minutes or so that elapses, I lose my mental hold on the more subtle details of pickup sound *(q.v., AHC's comments on page 76 of Vol. 8, No. 5 re. changing MC load resistors). The fragility of the WTA's leads, and the impossibility of replacing them if they break, are also factors in my reluctance to use the WTA/VPI for testing.*

(Remember *Mad* 's send-up of *Condemner Reports?* "We tested 8 sewing machines, 4 of which were easy to sew on, but hard to test, and 4 of which were hard to sew on, but easy to test. With the interests of you, the reader, in mind, we chose the latter 4 to report on." This is no different!)

The obvious solution would be for *Stereophile* reviewers to agree on some good-sounding, moderately-priced arm and 'table to be used for cartridge tests (AR 'table and Sumiko MMT, perhaps). This would provide greater uniformity of reviews, while allowing the reviewer to own whatever other 'table he wanted for general listening. How do our readers feel?

Back to the pickups. There were several sonic differences and similarities that were

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2 True, but the only preamps with decent built-in pre- 
preamplification cost a bundle; the Klipsch SK-5 and the Audio Research SP-11 (the Electrocompaniet Ampliwire I also does a good job for "only" about $1800). If you’re serious about using low-output moving coils, you’d better get a good step-up (see Vol. 8, No. 5).

3 This point is well-argued, but sometimes the choice of tonearm can crucially affect the sound of a cartridge. JGII found (Vol. 7, No. 8) that the WTA made some otherwise unremarkable cartridges sound quite good. The reviewer has a responsibility to point out these interactions where they occur.

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Stereophile
maintained over a variety of recordings. Both pickups tended toward slightly spitty sibilants that didn't blend well with other vocal sounds. The 23RS consistently showed a better sense of depth, with greater ambience, and, more significantly, a better relation of ambient to direct sound. That is, it seemed more coherent. Both were good trackers; no apparent mistracking was ever noted. (I've stopped using You-Know-Which record to test tracking. It's meaningless. Sopranos of either sex are much better. For testing pickups, that is.)

For those of you who might like to duplicate this evaluation, or perhaps use my techniques for testing other cartridges, here is a list of the specific recordings, and the results:

- Opus 3 7900, We Need a Title, side 1, bands 1&7. The Dynavector had slightly better focus and immediacy on vocal sounds. With the Signet, percussive transients seemed somewhat muffled and laid-back.
- Reference Recordings RR-15, Church Windows. Hard to pick, here. The Signet had the more impressive bass, while the Dynavector showed slightly better delineation of inner voices and faintly cleaner cymbals.
- Sheffield Lab 24, Firebird Suite. Again, hard to choose. The Signet's bass line was both more detailed and more agreeably "rumbly."
- Sheffield Lab 22, Mozart & Grieg Chamber Works. Here, the Dynavector was noticeably more transparent and alive-sounding.
- Varese-Saraband STV 81135, 7th Voyage of Sinbad. The Dynavector was the more transparent, and had notably better transients. The Signet sounded rather dark on brasses, with the Dynavector sounding distinctly "blatterier."
- Reference Recordings RR-3, Kotekan. This recording shows the differences between these two pickups better, perhaps, than any other. The Signet has a cool, slightly sterile quality, whereas the Dynavector is distinctly more warm, immediate, and alive. With the latter, I had a lot of trouble ignoring the music—a quality that I like—to concentrate on the sound.

I "apologize" for again preferring a Dynavector product. (Those who feel I must be under Dr. Tominari's thumb should check out my review of the Dynavector PE-2 "Phono Enhancer" in Vol. 9, No. 1.) The Signet is not a bad pickup, just a disappointing one. I'm feel that if they would get rid of the upper midrange suckout, and shorten the cantilever, the sonic gap between TK10ML-II and the better moving coils would be significantly narrowed. Could I please have a Signet moving-coil for review? 4

4 No. in a reversal of previous preferences. JGH has commandeered the Signet moving coils. Judging from his response (see elsewhere in this issue), he may not be willing to pass them along to BS. —LA

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THE MAGNEPAN MG IIIA: A HIGH END "BEST BUY" GETS BETTER

Anthony H. Cordesman

I must confess to a certain sentimental affection for Magnepan products. An early version of the Tympani did more to rekindle my interest in audio than any other speaker I can think of. In a world which seemed doomed to finding out just how small and dull it could make acoustic suspension boxes, the Magnepans reminded me that speakers could produce a large open soundstage, real dynamics, and musical life.

Both box speakers and electrostatics have gotten far better since that time, but Magnepan has continued to steadily improve its planar speakers. It also has introduced some superb ribbon tweeters, and while some might argue that the Decca ribbons were a serious product in the U.S., I still feel Magnepan should be given the credit for introducing the first successful U.S. speaker—the MG-III—to use a ribbon tweeter.

The Magnepan MG-III, introduced several years ago, may have been ahead of its time. Few U.S. reviewers and audiophiles had any real experience with ribbon drivers, and there was a natural tendency to treat them like any other tweeter. In practice, this often meant too little attention to problems in source material and to the need to readjust cables or VTA/SRA; the MG-III was too revealing of details in the highs.

While the MG-III has since become a relatively popular speaker, many listeners initially found the highs to be too quick and detailed, and reviewers complained about the imbalance between tweeter and midrange. These complaints were and are legitimate, in part: there is still a slight discontinuity between the ribbon and midrange panel. Experience with other ribbon speakers like the Apogees confirms the suspicion that ribbon tweeters which measure flat often seem to have too much treble energy.

Magnepan solved some of these problems shortly after the introduction of the
MG-III by offering plug-in resistors to slightly attenuate the highs, even though many user and reviewer complaints were not caused by the speaker (see above). The MG-III's ribbon tweeter was simply revealing more about the input from recordings and electronics. Being audiophiles, other users ignored the manufacturer's instructions (which are about as simple and useful as instructions can get), failing to give the speakers enough space from the rear and side walls to operate properly, or to aim the tweeter ribbons towards the listening area.

These points are worth mentioning because they still apply. The MG-IIIAs is not a dramatic change from the MG-III. In fact, the basic change in the speaker is not acoustic, but stylistic: it is simpler and more attractive. The new feet for the base and new wooden frame create a speaker that disappears nicely into the room, but retains enough style to be very attractive, joining the Acoustats and Apogees in being close enough to sculpture that most wives can live with it quite nicely.

As to any other improvements in the MG-IIIAs, I am not sure how much they really affect the sound. My acoustic memory is scarcely perfect, and I have had a great deal more experience with ribbon speakers since I first encountered the Magnepan IVs and IIIIs. I was able to get significantly better performance out of the IIIAs than the IIIIs, however. Years of fiddling with cables and interconnects, acquisition of tonearms with rapid VTA/SRA adjustment, and added experience with speaker placement all helped—which indicates that new owners are likely to benefit from the kind of dealer who will set up the speaker or come by to check it out and offer advice.

The highs, as before, were superb. I did end up using the plug-in resistor-fuse assemblies to slightly attenuate the highs, but this is a matter of personal preference: I could easily live without them.

With a really good cartridge and electronics (I used the Clearaudio and Monster Alpha 2 cartridges, the Audio Research SP-11 preamplifier, and the Audio Research D-250-II Servo and Counterpoint SA-4 amplifiers), the upper octaves provided excellent detail and transparency. superb coherence, and outstanding air and sweetness. Every bit of quality in the front end is mercilessly revealed, but when the "going in" is good, the "coming out" is excellent.

There were very slight problems apparent in the transition from ribbon tweeter to planar midrange. They were far less apparent than with all but a handful of cone speakers, and compensated for by very wide dispersion, and a midrange sound which was open and live without making the listener feel the usher had just dragged him into the front row. The overall timbre was excellent, with no change from the midrange up to the limits of my hearing (and that of assorted family females).

Getting the best transition from midrange to bass, and overall bass energy levels, required careful amplifier choice and speaker placement. A couple hours' listening and fiddling, however, was enough to set up the MG-IIIAs quite well, with good-to-excellent bass and lower midrange performance. This is not a speaker with deep, powerful bass, and the lower midrange is slightly analytic, but the bass line is well-defined down to about 42 Hz, and deep bass energy is surprisingly good. Anyone looking for good orchestral bass will not be disappointed. The MG-IIIAs go much deeper than the Quad ESL-63s, and as deep as most cone speakers. They just are not rock-digital, cannon-power, or organ loudspeakers.

You also will find that once the Magnepan MG-IIIAs are properly placed, they are freer of lower midrange and upper bass resonance than most cone speakers. The result is a clearer and more realistic lower midrange, and bass which is free of the peaks and valleys that often make powerful bass a curse in real-world listening rooms. I found this to be particularly rewarding with bass strings, piano, and the lower woodwind notes. Natural bass is far better than powerful bass if you are really going to listen to music, which is one reason I'd never use this speaker with a subwoofer.

Dynamic coherence—the ability to convincingly reproduce sudden small or large shifts in the volume of music without favoring some instruments over others, or loud passages over low—was very good.
The MG-IIIAs definitely benefit from a powerful amplifier, however, particularly one that brings out their lower midrange. Lower-powered amplifiers are acceptable, but a clean, high-powered amplifier is necessary to really open them up.

The soundstage had excellent, well-defined imaging, an open character, very good height and width, and reasonable depth. In fact, the soundstage of the Magnepan MG-IIIAs compares interestingly with that of the Quad ESL-63s. The Quads give you a soft midhall perspective, but one that seems a bit rolled off in the highs compared to the Magnepans. The Quads have a more stable soundstage in terms of listening area or listener movement, but it's not as detailed. Both speakers are slightly lacking in the illusion of depth, but not seriously so. Accordingly, the MG-IIIAs held up against one of the best soundstages around.

I did not find that they benefitted from biamplification. Even with two identical high-quality power amps, I preferred the sound coming from one truly top-quality amp. Mixing amplifiers for upper and lower frequencies made things worse. The best coherence and most convincing music came from a single amplifier in every case, with the exception of a few really loud selections.

In summary, the MG-IIIAs require a little love and care, but the sum is then as good as the parts. They offer natural musical life with a wide range of music. They do not favor one type of voice over another, orchestral music over baroque, or guitar over violin. You're never jarred by the feeling that the sound is coming from a small box, or by an unrealistic combination of timbre and apparent hall position. Like most really good speakers, the Magnepan MG-IIIAs allow you to ignore the compromises speaker designers must make to produce real-world products. You can simply sit back and listen to the music.

THE ACOUSTAT ONE SPEAKER SYSTEM: EXCELLENT VALUE, etc.

Three-piece speaker system with two narrow 72" by 11" by 3½" electrostatic panels and common subwoofer with built-in crossover; panels available in beige fabric with bases, subwoofer finish in teak, oak walnut, and gloss black. Subwoofer dimensions: 18½" cube using 10" polypropylene woofer. Frequency response is 30-18,000 Hz ±3db. Maximum sound pressure level, measured at 15 m. in 14' by 18' room: 108 dB. Minimum power requirement: 75 watts/ch. Nominal impedance: 4 ohms. Price: $1250. MANUFACTURER: Acoustat, 3101 Southwest First Terrace, Fort Lauderdale, Florida 33315. (305) 462-6700.

Acoustat speakers have long been one of the best values in audio. They are reliable, dynamic, electrostatic speakers at affordable prices, and have always delivered very good to excellent sound. The company has consistently improved its loud-
speakers with detailed refinements, almost all of which have been retrofittable at reasonable cost.

I have listened to every speaker model that Acoustat has built; I must confess that my favorite so far is the One + One. It sells for $1550, and offers full-range electrostatic performance with the best dispersion and soundstage of any Acoustat, rivaling in coherence, timbre, and detail speakers at triple the price. Accordingly, my prejudices show when I review the Acoustat Model One: it competes directly with my favorite. The Model One, at $1250, is priced close to the One + One, but uses a subwoofer to gain bass extension and more dynamic capability. The difference is essentially the difference between a pure electrostatic, which is likely to please the chamber music and jazz group fan, and a good hybrid, which is more likely to please the rock enthusiast or lover of full orchestral music.

The Case for the Model One

The Acoustat Model One is a good hybrid. This is unusual enough to merit considerable praise; I have not been impressed by most moderately priced efforts to blend electrostatics with cone woofers. While hybrid combinations can be excellent, they usually require a price tag of well over $2000 for the electrostatics and subwoofer combined. For example, Entec, Janis, and RH Labs all sell excellent subwoofers and separate crossover-amplifier systems. Martin Logan makes an excellent hybrid called the Monolith. These systems, however, cost at least as much for the subwoofer and crossover/amplifier as the entire Acoustat Model One speaker system.

The normal cost of adding a cheaper woofer or subwoofer to electrostatics has been the loss of bass control, excessive warmth, or a suckout in the lower midrange and upper bass, a tendency towards boom or one-note bass, annoying shifts in the integration of deep bass and treble and midrange data, and image shifts in the lower midrange and bass. This can be acceptable if all you want is “boom” and “loud,” but you can always get the same thing from Cerwin Vega and go deaf at a far lower price.

Fortunately, the One’s woofer cube does surprisingly well in all of these areas, and is a perfectly acceptable sonic compromise. Slight discontinuities are still apparent, however. The crossover in the woofer cube is set at about 150 Hz, and you can hear the effect in the form of a slight shift in timbre and speed in the lower midrange and upper bass. And, in spite of considerable opinion that deep bass is not directional, I feel that the woofer cube seems to shift the image slightly in the direction of the cube. The subwoofer does not, however, produce the usual problems in timbre in the crossover region. Further, it is much better damped than most such products. It is tightly controlled enough that it does not boom or make the bass seem to lag behind the rest of the sound.

The power levels and low-bass frequency extension in the woofer cube are well chosen to match the electrostatic panels under ordinary listening conditions. The bass power doesn't overpower the room or the midrange and highs. The woofer cube is not a subwoofer in the sense that there is much power below 35 Hz, nor is it a "power woofer" in the sense that you can drive the whole system to ear-damaging levels. It seems to have been kept deliberately within the performance limits necessary to produce the best blend of natural treble and adequate bass for rock, symphonic, and jazz music. Most manufacturers of small subwoofers fall into the trap of trying to cheat the laws of physics with overly-complex servo systems, or system-tuning that gives added low-frequency extension at the cost of natural musical sound. Acoustat clearly realizes that less can be more, and has opted for musical realism over unrealistic drama.

The 18” bass cube for the Acoustat One is small and well-finished enough so it can easily be placed without creating another great audio ugly. Available in teak, walnut, oak, rosewood, or black finish, for once you can put a plant or bust on top of the speaker without affecting its sound.

The ability to experiment with location is at least 50% of the problem in getting the best out of the subwoofer. Acoustat makes this easy without damaging most
decors, and while my wife didn't love it, she didn't hate it. That's as lovely as a subwoofer gets!

Most importantly, the subwoofer lets the sonic merits of the Acoustat electrostatic panels come through largely unscathed, and these merits are considerable indeed. Acoustat has always produced a good-sounding electrostatic, but never with quite the delicacy of the Quad ESL-63s or similarly top-priced competition. Times, however, have changed. The latest Acoustats use far better drive units and a new electrostatic panel coating. This brings them very close in transparency to the best and highest-priced competition, and the Acoustats are superior in power handling and reliability to any other electrostatics I know of.

I will not attempt to judge the particular technical factors that have led to this level of improvement. Acoustat claims that its Mk-141C "Magnikinetic Interface" uses improved drive-unit and transformer technology to improve the sound of the panel and its integration with the woofer. Also, 40% more turns (than before) in the transformer is said to improve the low-frequency saturation limit, allowing a more seamless crossover to the bass unit. Acoustat claims this produces a tenfold reduction in low frequency distortion, a more linear impedance curve, easier amplifier load, deeper and tighter bass, increased dynamic realism, and smoother and more natural treble.

The new panel coating is stated to use carbon particle technology with "1000 times" more resistivity. Acoustat claims this maintains a more constant charge, and reduces hot spots in the electrostatic diaphragm. The sonic impact is to improve dynamic range, reduce distortion, improve vertical dispersion, and reduce a past tendency to produce minor sound shifts as the listener changed height.

Regardless of the technical merits of these claims, I was very impressed with the result in terms of both transparency and dynamics. The Model Ones, the Model One+Ones, and other new Acoustats I have heard in recent months are much cleaner throughout their entire frequency range. There is more air with all types of music, and the tendency of earlier Acoustats to harden and lose detail in dynamic passages has been greatly reduced. The lower mid-range is now very close to the Quads and the Roger West Sound Labs in sweetness.

The Model ones are remarkably flat and uncolored from about 200-12,000 Hz. The highs then roll softly and become more directional, although there is a good two-and-a-half-person listening area within an eight-foot distance from the panels. The sound balance is mid-hall, and the highs are forgiving without being forgetful.

Low- and high-level resolution of detail and musical harmonics are much better than in most cone speakers, and better than in past Acoustats. Detail and transparency is achieved without the etching of some ribbon designs, and is smooth and natural. The Acoustats produce musically natural detail, not temporarily exciting but unnatural amounts of information. The new Model One panels of the Acoustats now rival the Quad ESL-63s in transparency, and outperform them in apparent transient speed.

The imaging is good once the speakers are properly set up. They should be at least two feet away from the rear and side walls in most rooms; you should experiment at length to get the best combination of imaging, centerfill, and depth. With proper placement, you get a good point-source effect unusually free of floor and furniture effects, and very natural in terms of soundstage width. Soundstage height and depth is not up to that of the Acoustat Model One+Ones, or that of top competitors like the Infinity RS-1B, but is good. The Model Ones do not rival the Quad ESLs in overall soundstage performance under optimal conditions, but the Acoustat Model Ones and One+Ones are less room-sensitive.

All in all, the Model One is an excellent value, probably the most affordable high-end electrostatic speaker available anywhere.

After All That, Cordesman, Why Recommend the Acoustat One+Ones? I still prefer the One+Ones. Admittedly, they have slightly less apparent bass than
the Ones, and possibly less extension into the deep bass (although any such differences will be highly room-dependent). However, the One+Ones have superior lower midrange and bass coherence. Their added height means they image better—although many people may lack room for an eight-foot speaker. They still create a relatively narrow (three-person) listening area slightly lacking in depth, but soundstage height is brought back into proportion with width; with organ music, or orchestral music with percussion, depth seems to be improved, and more coherent.

In my opinion, the basic difference between the two models is that the Model Ones are a very good speaker system, while the Model One + Ones approach greatness. The One + Ones get the full value out of the electrostatic panels: they are coherent and seamless from top to bottom. They are one of those few speakers you can listen through, instead of to. Close your eyes with a good recording and electronics, and you will be able to forget the size and location of the speaker and listen to the music without jarring limitations of coherence and integration.

In an ideal world, even the Acoustat One + Ones would have more upper-octave dispersion, but they are at least as good in this respect as far more expensive speaker systems like the Quad ESL-63s. The Ones + Ones are also superior to the Quads in dynamic range and bass extension, and may even be superior in resolution. The Quads are sweeter, but sound too forgiving in the upper midrange. While a properly set-up pair of Quads will still provide a better overall soundstage, the One + Ones now outperform the ESL-63s on most organ, opera, orchestral, large jazz group, and rock music at musically natural volumes. They also do so at nearly $1000 less per pair.

I would also rank the Acoustat One + Ones as clearly superior to the Martin Logan CLS—another electrostatic which costs about $1000 more than the Acoustats. The Martin Logan CLS is unquestionably one of the most visually attractive speakers ever built, and it can be excellent at low to medium-low listening levels, if you listen to music without demanding dynamics or deep bass. The Acoustat, however, has equal overall transparency, good to very good dynamics, good bass, much better amplifier compatibility, and can survive reasonable listening levels and amplifier accidents. No Martin Logan CLSs I have heard at a dealer or home has long survived the shock effects of demanding use.

The Acoustat One + Ones may cost more than the Model Ones, but I feel they are today's best buy in electronics. Their trade-offs make them rival top-quality cone speakers like the Thiel and Vandersteens, and they are an important alternative to such high-priced electrostatics or ribbon/planar bipoars as the Apogee Duettas and Magnepan Illas. The Acoustat One + Ones deserve your time if you are auditioning speakers between $1000 and $2000.

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**THE COUNTERPOINT SA-12: A NEW HYBRID AMPLIFIER**

Anthony H. Cordesman

Hybrid (tube/transistor) stereo power amplifier. Power output: 85 watts into 8 ohms, 160 watts into 4 ohms. Frequency response: 5-100,000 Hz. S/N: 92 dB. Harmonic and IM distortion, 85 watts out into 8 ohms: typically 0.2-0.75%. Input impedance: 47,000 ohms.

*Stereophile*

The Counterpoint SA-12 is a pleasant, high-quality, stereo power amplifier similar in concept to the New York Audio Labs MOSCODE power amplifiers, but differing significantly in overall sound character. The SA-12 is a low-feedback design using a blend of four 6DJ8 dual triodes in the input stages driving MOSFETs in the output stages. The basic concept is to get the open and dynamic sound of tubes and still be able to use a relatively low-cost transistor output stage. MOSFETs are employed because of their ease of use and tubelike transfer characteristics.

The SA-12 does not use feedback in the output stage, and is claimed to be relatively insensitive to load, regardless of inductive reactance characteristics. The SA-12 uses polypropylene capacitors, Roderstein 1% "Resista" resistors, and a high-quality copper-clad epoxy-laminate circuit board.

Automatic muting is provided to protect the loudspeakers during warm-up and in the event of any interruption of AC power. Speaker fuses are used to protect the speakers. The tubes are conservatively operated: the manufacturer expects them to have an operational life of several thousand hours.

The Sound

The SA-12 is not particularly high-powered by today's standards, but using tubes in the drive stages seems to work as well here as it did in the NYAL hybrid amps. The amplifier is unusually live and open for a unit in its price class, and performs better than its competition in terms of dynamic contrasts.

The highs and most of the midrange are very good: somewhat soft, and a little lacking in transparency and air, but never grainy or hard. The overall timbre is flat and extended, with a slightly "forward" sound in terms of tonal balance and dynamics. The result is forgiving rather than accurate, but this makes the SA-12 less fatiguing than most similarly priced all-transistor power amplifiers.

The bass and lower midrange are very good for the price and power. This is scarcely the ultimate amp in terms of the deepest bass, and control is a bit lacking for woofers that really need it, but the bass holds up well under strain. Low-frequency pitch definition is good. The SA-12 is not the amplifier for loads much below 3 ohms, but had no trouble with the midrange and treble panels of the Infinity RS-1Bs, the Magnepan 3As, or normally difficult crossover networks like the Spendor BC-1. The SA-12 should work well with any electrostatic or cone speaker not requiring a very high damping factor.

Counterpoint does give you many of the benefits of tubes in the SA-12, but makes no effort to create the rich sound and romantic lower midrange and bass power I remember from the New York Audio Labs Moscode 600. (I didn't have a chance for direct comparison). Like most Counterpoint products, the emphasis is on the
midrange and flat, extended highs. This means the SA-12 is exceptionally neutral in timbre, introducing no special sound character as the price of using tubes.

The soundstage is open, has convincing imaging without etching or exaggeration, and has reasonable depth. This is not an outstanding amplifier in terms of soundstage performance, but it is a very natural and musical one. It is more convincing than surprising or exciting, and a far better choice over the long haul than those amps which are.

The Counterpoint SA-12 stands out from the crowd only in its unusually good dynamics, touch of tube-like sweetness, and sense of air. It is, however, good or very good in every other respect, including its ability to drive all but the most difficult low-impedance loads.

Your decision to buy the SA-12 will depend on how much you care about the special sonic impacts of the tube drive stage. If you listen to massed strings, wood-winds, demanding voice, and solo stringed instruments, you will care. There are many good transistor amplifiers in this price range, but most have at least a tinge of hardness, and are less dynamic, particularly at lower listening levels.

The SA-12 is a significant sonic contrast to the NYAL Moscode 300 d 600, and far cheaper than any tube amplifier with comparable power. I would, therefore, put the SA-12 on your short list if your dreams of large tube amplifiers have outpaced your income, or if you are looking for musically natural sound rather than the ultimate in analytic capability.

The SA-12 is particularly exciting on first hearing. It requires some care in matching it to a speaker, and generally works best with a speaker relatively flat at the top end. This Counterpoint is something of a "musician's amplifier," more for the listener who wants an unobtrusive tool for prolonged music listening; it's not a "super amp" for audiophiles seeking electronic drama.

THE COUNTERPOINT SA-4:
A SUPERB OTL AMPLIFIER FOR
THE FAVORED FEW

Anthony H. Cordesman

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Counterpoint SA-4

Stereophile
Mono, output transformerless tube power amplifier. Power output: 190 watts into 16 ohms, 140 watts into 8 ohms, 80 watts into 4 ohms. Frequency response: 0.8-100,000 Hz. S/N: 92 dB. Harmonic and IM distortion, 100 watts out into 8 ohms: typically 0.2-0.75%. Input impedance: 100,000 ohms. Signal polarity: non-inverting. Feedback: overall, voltage loop; local, degenerative cathode. Power consumption: 200 watts, idle; 700 watts, maximum. Three-year transferable warranty (except tubes, 30 days). Dimensions: 19" W by 6 3/4" H by 19" D. Weight: 120 lbs/pair. Price: $5225/pair. MANUFACTURER: Counterpoint Electronic Systems, P.O. Box 12294, La Jolla, CA 92037-0625. (619) 453-9090.

Some audio products deliver truly superb sound of a kind that really makes all the frustrations of building a high-end system worthwhile; they also require exceptional attention and care. The Counterpoint SA-4 is a case in point. With the right speakers, it competes for the title of Most Transparent Amplifier Available at Any Price. On the other hand, this amplifier steadily loses output power as speaker impedance drops; it must be carefully matched to the right speaker. Then, and only then, can it produce one of the finest musical experiences available.

Technical Description

The SA-4 eliminates both the usual output transformer and the output coupling capacitors. It is not only an OTL (output transformerless) amplifier; it's about as close to a straight wire with tubes as anyone can get. The only problem is that there is no way to maintain power into low impedances, and the amplifier has trouble with some difficult loads (especially those with dynamic impedances below 4 ohms). In a word, amplifier-speaker interaction effects are especially unpredictable.

This form of OTL design carries the Futterman designs pioneered by New York Audio Labs one step forward. The lack of an output coupling capacitor extends bass response to less than .1 Hz, although a second input is available which rolls the bass off at 16 Hz. The drive stages use one 12AX7 as a "long-tailed" differential amplifier, and two 6FS5s as phase splitter and gain stage. Direct coupling is used throughout.

The output stages use eight heavily regulated high-current 6FL6 pentodes in a "totem pole" configuration. They normally operate in the AB mode, but can be biased close to Class A. This high biasing is recommended; it shortens tube life but makes the sound even sweeter. Even with such biasing you should get six months of tube life; more moderate biasing may yield as much as two years.

To avoid any risk of dumping DC voltage into the speakers, DC offset is continually monitored by a TLO-82 op amp, with a time constant of 12 seconds. In addition, the amp is monitored by an op amp-based comparator. If the offset exceeds a fixed limit, a set of relay contacts in series with the speaker terminals opens, removing the risk of damaging voltages delivered to the speakers. Signal distortion from relay contact rectification is minimized by an 8 mF polypropylene capacitor in parallel with the relay contacts.

The amp is superbly built: it has a massive power transformer, epoxy circuit boards, and a modular construction allowing (in most cases) rapid repair without having to send the amp back to the manufacturer. The resistors and capacitors all seem to be very high grade, and there is a massive bank of power-supply capacitors. The Counterpoint SA-4, visually excellent, is available in black or silver: it looks like a superb piece of high-end gear.

Above all, the SA-4 has excellent protection, exhibiting the careful control of high voltages needed in an OTL design to guard against internal shorts or critical part failures. It performed with great reliability right out of the box. It can also be biased quickly from the front panel, and even the fuses are on the front panel—a design feature which should be compulsory for any large amplifier.

The Sound

Transparency is getting to be an overworked adjective, but the Counterpoint SA-4 achieves it to an extraordinary degree. Sweet and airy, yet convincingly close to
the Audio Research D-250-II Servo in its ability to pass on every bit of the music and soundstage, the SA-4 provides a tremendous amount of detail and information in a musically natural way.

The SA-4 is also capable of exquisite dynamic contrasts. You hear what you pay for in the naturalness with which the softest and loudest passages are handled, and the way in which sudden dynamic changes in the music seem convincing and right.

The highs and most of the midrange, with even the most demanding voice, strings, percussions, and woodwinds, are excellent into virtually any load. The bass and lower midrange are highly speaker-dependent: they can be excellent into compatible loads, but lose all extension, dynamics, and lower midrange warmth with incompatible speakers.

Unlike the New York Audio Labs OTLs, the overall sound character of the SA-4 is not rich and romantic; it is, instead, rather extended and flat. If the NYAL amps have a touch of the 19th century above their sound character, the Counterpoint SA-4 is the perfect amplifier for the 17th and 18th centuries. Telemann, Mozart, and Bach might well have rushed down to their local high-end store to buy one had the SA-4 been available.1 (Saleri, on the other hand, bought all of bis stereo systems off department-store racks.)

The soundstage is open, has convincing imaging without etching or exaggeration, and has excellent depth. Like many really good amplifiers, it opens up electrostatics and the Magnepan MG-IIIbs, and makes the music far more live. If you have blamed your electrostatic for sounding musical but a bit closed-in, try the SA-4. It not only improves the soundstage of the Quads, but of the Acoustats and Sound Labs as well. It is also excellent in this respect with such demanding cone speakers as Thiels, Vandersteen 2Cs, Syntheses, and Fuseliers.

The Counterpoint SA-4 is definitely a new contestant for Best Amplifier Around, joining the select circle of manufacturers—Audio Research. Classe, Conrad Johnson, Jadis, and Krell—who define the limits of the art. In fact, the Counterpoint SA-4 is as good an amplifier for the Quad ESLs and Magnepan IIIbs as exists anywhere.

There is no doubt, however, that the SA-4 is load-sensitive, which shows up in many subtle ways. It has virtually no damping factor, and is very definitely not for speakers that need amplifier help in providing control. It will produce 140 watts into 8 ohms and drive relatively simple 4-ohm cone speakers at 80 watts with no trouble, but there is a tremendous loss of power and dynamics, and at least some clouding of its transparency, when driving speakers at less than 4 ohms.

The SA-4 is definitely not the amplifier for complex ribbon systems that drop much below 6 ohms (such as the Apogees), or a difficult load (the EMIMs and EMITs in the high frequency and midrange panels of the Infinity RS-1Bs). Try the Counterpoint SA-20 in those cases; it’s supposed to produce over 1000 watts into 2 ohms.

The practical problem in making a decision to buy is how to match the proper speaker to one of the sweetest and most transparent amplifiers ever built. The SA-4 is an amplifier you must audition with the given type and model of speaker you intend to use, and preferably in your own home. Find a dealer who knows and loves the amplifier, and let him demonstrate it.

I’d want good dealer support for a high-end amplifier of this price and class in any case, but you can’t simply plug in the Counterpoint SA-4 and expect to hear it at its best. You may also need help choosing the speaker, speaker cables, preamplifier, and front end which can live up to such an amplifier. With a good partner, however, the SA-4 can be made a key part of a truly superb and musically enjoyable system.

1 Are you kidding? They would have been making their own—or writing for high-end journals, with opportunities for “extended loan.” —LA
MANUFACTURER: Ken-Sabe. Importer: Sumiko, PO. Box 5046, Berkeley, CA 94705. (415) 843-4500.

You read that right: a cartridge demagnetizer. Does the world really need such a sophisticated device? It would seem so. Just as we've begun to recognize that the head demagnetizer may be superfluous (at best, perhaps, a "chicken soup" accessory), we are discovering the need to demagnetize our pickups; it's surprising no one made such a device before.

All magnetic cartridges contain magnetic material; not just the magnets (moving or stationary), but the iron, located in the coils, which channels the magnets' flux, thereby increasing output. It's common knowledge (and common sense) that moving-magnet and moving-iron pickups contain fairly large chunks of iron or other magnetically permeable material. What came as a surprise to me is that many low-output moving coils also have some.

At last summer's CES, Dr. T(ominari) of Dynavector explained the reason. Most low-output MCs run about 0.2 mV, usually considered the lowest practical level. It seems that the coils and magnets in most pickups cannot produce even this much signal unaided. Dr. T. had to choose between a small coil with a tiny iron core, and a larger, "naked" coil. He opted for the former because it had lower mass. He felt the slight increase in distortion from the iron was outweighed by the improved tracking and transient characteristics of a lower-mass system.

In any case, the iron, wherever it's located, gradually magnetizes, due to the magnet's propinquity! One might expect this to produce audible distortion, or high-frequency grain (you may remember the problems Grado had with its cartridges due to cantilever magnetization), but Sumiko also suggests such defects as loss of ambience and degraded imaging. I didn't know quite what to expect, so, gadget freak that I am, I took a chance and bought one.

1 Who can forget the episode of Dobie Gillis where Dobie first meets Zelda Gilroy in biology class? She explained that since their last names were so similar, they would often be seated next to each other, and had to fall in love, due to propinquity. John Ciardi, eat your heart out.
Besides, I could always return it.

I was frankly afraid of blowing my Dynavector's coils. The FluxBuster's output is at 30 kHz, with a peak amplitude of 6 volts. The output impedance is, however, around 125 ohms; since most MCs are 30 ohms or less, this limits the current. (Most MMs have a much higher impedance, so the full 6 volts appears across the coil, permitting sufficient demagnetizing current to flow.) A bit of calculating revealed the peak power dissipation would be a trivial 3 mW.

I listened to the pickup, demagnetized it, then listened again. Much to my surprise, the demagnetization made the pickup sound less bright (not duller; less bright). There was no change in any other sonic characteristic. I judged the change to be an improvement in naturalness.

Of course, I can't prove this, because I neglected to make before-and-after recordings, as Gordon has suggested. I'm reluctant to remagnetize the pickup, partly due to the slight chance it might be damaged, but mostly because that wouldn't prove anything. After all, the question is not whether the FluxBuster can demagnetize a pickup, but whether there is any residual magnetization in need of removal. As far as I'm concerned, there is. In any case, I'll try demagnetizing again in a few months to get a feel for how long it takes magnetization to build up. Those with access to a FluxBuster should use it about once a month.

There is a minor disagreement between Sumiko and myself as to the proper use of the FluxBuster with moving-iron (variable-reluctance) pickups. Since their coils are wound 'round the magnet, there seems to be a chance of weakening the magnet without demagnetizing the iron on the cantilever, which is what really needs demagnetizing. Sumiko feels the magnet-coil coupling to be so loose that there's little likelihood of harm. They have more experience in these matters, so I'd suggest you contact them before using the FluxBuster on a Grado, ADC, or B&O pickup.

Sumiko is not pushing the FluxBuster as a consumer item. My guess is that they want dealers to use it as the equivalent of Radio Shack's "free battery" card. You know, bring your pickup in once a month for a degaussing, and maybe buy something while you're there.

Should you buy one? $100 is less than the cost of a couple pairs of high-tech cables, and if the FluxBuster educes another 6 months life from an expensive pickup, it's paid for itself. Don't be fooled by Sumiko's sneaky attempt to give you something for free that you could just as easily buy.

THE SUMIKO FT-3 TONEARM:
AN AFFORDABLE COMPROMISE WITH THE BEST

Anthony H. Cordesman

Sumiko FT-3

Stereophile 103
Pivoting tonearm with overall length of 305mm, effective length of 239mm, overhang of 17.3mm, offset angle of 23 degrees, record center to pivot point distance of 221.7mm, cartridge weight range of up to 14 grams with extra weight, nominal effective mass of 12 grams. Price: $475. VTA-adjustment base: included with FT-3 arm, $100 option (VTA-16) for Premier MMT. Interconnect box: included with FT-3 arm, $70 option (TIB-1) for use with any tonearm. MANUFACTURER: Sumiko, PO Box 5046, Berkeley, CA 94705. (415) 843-4500.

The competition at the top in tonearms is getting so strong and expensive that it is a pleasure to see a new, relatively affordable tonearm of sufficiently high quality to be used with even the best cartridges and turntables. The Premier FT-3 is a logical upgrade of the Sumiko MMT, with some of the features of David Fletcher’s "The Arm."

The FT-3 is similar to the MMT in many ways. An upgrade of a standard Japanese arm improved to Sumiko’s specification, the FT-3 is designed as an "audiophile model." It is a fixed headshell arm with improved cone and ball race bearings, a magnesium headshell, and anti-resonant treatment. The tonearm tube is relatively large in diameter for an arm at this price, and is filled with the same damping foam as "The Arm."

The result is not up to the manufacturing standard of an Alphason or Syrinx in terms of finish, which is rough, or quality of machining. I also would like to see dual setscrews on the base mount. The FT-3 does, however, seem very well built where it counts: the bearings are tight and without play, the lift device functions smoothly, without drift, and the alignment of all parts is excellent.

The FT-3 allows for very precise setup. Its geometry allows easy use of any of the standard protractors, and there is ample range of overhang adjustment. The mildly infuriating azimuth adjustment must be set with a small Allen wrench below the tonearm tube, but at least there is an azimuth adjustment! Far too many expensive pivoting tonearms (the Syrinx is an exception) lack this extremely important feature. Few turntables preserve an exactly even plane between platter surface and tonearm mount, not to mention the fact that many clamping devices alter the effective surface angle of the record by several degrees. Unfortunately, even a 5° deviation in cantilever perpendicularity can ruin the separation of a cartridge and alter soundstage performance. It is essential that the cartridge bottom be parallel to the record surface to get the best performance, particularly when using cartridges with line-trace, Shibata, and van den Hul styli.

The FT-3 comes with a VTA-adjustment accessory that can also be purchased separately for use with the Premier MMT, or any other tonearm with a 16mm mounting post. It is not particularly elegant; some care must be exercised to avoid stripping one of the setscrews out of its socket. It is, however, completely functional. Unless you are exceptionally ham-fisted, you can set VTA/SRA while you are playing a record—which is virtually the only way the average audiophile can get the best performance out of a cartridge in his own system.

The problem with VTA and SRA is that there is no one "right" setting. There is a fairly wide band of tonearm height (and hence VTA) in which you trade one kind of distortion for another. You hear a slow shift from relatively dull, damped sound to hard or fatiguing highs. Adjusting VTA by guessing at tonearm height, stopping the record to raise or lower the arm, and then listening makes it very hard to zero in on the right setting.

Few dealers give much support in this area, and what they offer may well be irrelevant. VTA/SRA must be set to yield the best sound in a given system in a given location; the best VTA/SRA in a dealer’s showroom may be wrong in your home. Further, unless the dealer's ear is your ear, you may get too controlled a sound or, more likely, one that is hard and over-etched (because it sounds more dramatic, giving the illusion of transparency).

With the FT-3, and a few other arms,
you can begin with the damped-sounding VTA/SRA adjustment by starting with the cartridge tilting back. Then slowly raise the cartridge to the point where it is parallel to the record, then to the point where the cartridge is tilted up. At some point in this range of adjustment, you will hear the cartridge begin to lock in to your system. Once you’ve found this point, you can make minor adjustments to get just the right VTA/SRA.

Exactly how quickly you will hear these differences depends on your ear, the cartridge, and your speakers. Many listeners hear no major difference at first, but notice more life and detail several minutes after raising the cartridge from the “tilt down” position; then, as the cartridge is raised toward parallel and above, prolonged listening gets to be tiring or edgy. Bringing a woman into the act (unless you are a woman) will save a great deal of time: many women hear these differences much sooner than men.

Fortunately, the Sumiko FT-3 has the general sound quality to justify all this effort. Like all arms, it has a slight sound character. It is a bit soft in the highs compared to the Alphason, and less dynamic than the Syrinx, new SME, or Dynavector arms. The sound is rather well-controlled and even, with just a slight loss of transparency in the top octaves. Bass is good, though not as good as the new SME or Dynavector.

Much, of course, will depend on the turntable and exact cartridge used with the arm. The match between cartridge body and tonearm is never easy to predict, nor is the interaction between cartridge compliance and tonearm mass. The FT-3 does, however, work well with any moving coil or Grado moving-iron cartridge; its damping feature makes it also one of the few arms suitable for the Decca or Decca Garrot. The VTA device is massy enough to give the FT-3 a little better deep bass than most of its competition.

This makes the FT-3 very much a “price point” arm. If you happen to have $850 in small change you’ll be better off by far with a top-rated arm (see my mini-survey in Vol. 8, No. 7). At the same time, the FT-3 gives you your money’s worth. The FT-3 is audibly superior to the Sumiko’s Premier MMT, and comes very close to the best pivoting arms. It allows ordinary audiophiles to get the best out of their cartridge, and the $250-$350 in savings over the most expensive arms can help buy a much better cartridge!

Two cautions, however, before you leap down to your dealer’s to buy a sixpack of FT-3s: First, the VTA-adjustment accessory requires a trick cutout in the tonearm board. Get your dealer to do it, or, better yet, get a pre-drilled board from the turntable manufacturer. This is definitely not for most do-it-yourselfers. Second, you’re not likely to get much benefit from the TIB-1 interconnect box. The device isn’t bad—it’s very well-made, in fact—but the basic concept is bad. (I recommend it even less for use with other arms, where it costs you extra.) Even the best connectors and Litz wire add a faint sound character, and this will be in addition to the regular tonearm cable you use. No one should mix cables and add extra phono plugs and jacks at this low a signal level. Use a top-quality tonearm cable that plugs directly into the arm!

That aside, Sumiko should be congratulated for a good mid-priced arm well suited to a top-quality turntable. The FT-3 is solid value for money, and should provide years of good performance. Sumiko also has an excellent reputation for quality control; this means you’re likely to get a sample as good as the one I’ve reviewed—something that few competing manufacturers and importers can promise.

[4 Having never heard the TIB-1, I can’t comment on the seriousness of its sonic effect. The effect of the problem it’s intended to solve—defeat of turntable suspension through overly stiff tonearm cable—is well established. —LA]
I'm not quite sure why turntables inspire more passion than electronics or speakers, but somehow they do. Perhaps it's the Hiberian-Slavonic legacy of Ivor the Tempestinateapottenbottom, or the Sicilian heritage of Robert the Irascible, but many audiophiles find ranking turntables more important than listening to them. The status of owning the best seems more important than the music.

**Several Important Caveats:**

- First, and most important: while some of the sonic differences between the best turntables are important, they are not as important as the differences between cartidges and speakers; they may not be as important as the differences between tonearms. If you can't afford the very best cartridge and speakers, you needn't buy the very best turntable.

  The fact that Linn Sondek's advertising has made a British cult out of buying a comparatively high-priced Linn turntable—even for comparatively low-grade components—has no justification other than profits for Linn. The fact is that Acoustic Research, Ariston, Mitchell, Micro Seiki, Mission, Onkyo, Rega, Sonographe, Systemdek, Thorens, and Walker all make very good and quite musical turntables at very reasonable prices. No one need sneer at cheap analog record players like the Dual 505-II; the sonic returns diminish rapidly after you've spent enough to buy an Acoustic Research EB-101 (or ES-1) or Sonographe SG-3.

- Second: there is something a little pathetic about the audiophile who wanders endlessly through the wilderness searching for heavenly guidance as to whether Goldmund, Oracle, SOTA, or VPI is top dog. The truth is that all these manufacturers make a fine product. If most of these same audiophiles devoted equal attention to upgrading any of these makes of turntables to the latest model, buying the most suitable associated arm and cartridge, and ensuring proper setup, he or she would be much happier and get far better music.

  - Third: the best CD players are now even closer to the best turntables, tonearms, and cartridges. You may need to consider this in allocating your budget. Neo-Luddites and digital crackpots aside, CD can now survive direct comparison using top-ranking recordings that exist in both CD and analog (see elsewhere in this issue).

  Take a CD like *Jazz at the Pawnshop* (Proprius) or *River Road* (Opus 3), and use it to compare any analog front end you want with such CD players as the Mod Squad version of the Meridian Pro, or the Discrete Technology. You still lose some of the euphony, warmth, and sweetness of cartridges like the Kiseki and Koetsu—but no one has ever argued that these are technically accurate transducers. You will get from CD the sweetness, air, and depth to match some of the other top cartridges, like the Monster Cable Alpha 2 or the van den Hul MC-10.

  This said, there are still sonic differences between the sound and features of the best turntables, differences worth your consideration when you make your choice. Further, if you have the money, the best turntables are still worth buying. Far more of the best recordings and performances are only available on records. Even if you ac-
except the alarming idea that the purpose of a turntable is to enjoy music—rather than to watch manufacturers and reviewers fight—the best available turntable front end is still a cost-effective part of the best possible system.

**The Improved SOTA Star Sapphire ($1600): The Last Turntable You Will Ever Buy?**

The competition at the top has been pretty stiff in recent years. The Entec Granite ($6000), Goldmund Studio ($2900), Goldmund Reference ($14,900), Micro Seiki SX-5000 II ($5000), Oracle Delphi II ($1250), and VPI HW-19 Mark II ($885) are all superb turntables. Any of them would grace any system to the point where even the most demanding audiophile (though not divinity) could live happily with the result for years.

Nevertheless, if I were going to invest in my last turntable, I would currently invest in the SOTA Star Sapphire with the acrylic Supermat ($1600), and the SOTA Electronic Flywheel ($300) or VPI Powerline Conditioner ($300).

Combining the SOTA Star Sapphire's vacuum record clamping with the new acrylic "Supermat" has produced a turntable which is more neutral on more records than any other turntable I've tried at any price. I must admit that I have to make this statement on the basis of listening to the top foreign competition—like the Goldmund and Micro Seiki—on other systems. Nevertheless, I think the sonic differences are clear. You can hear more musical detail and transparency, with less coloration and noise, using the Star Sapphire and an arm like the Eminent Technology Two, than with other turntables, even those costing over $10,000.

The key to the SOTA's success seems to be the combination of vacuum clamping with the kind of hard plastic surface/metal-filled turntable platter pioneered by Goldmund, and now used in different combinations by both SOTA and VPI. The result is superior to all the competition in its ability to couple the largest number of records to the platter in a manner that produces the best possible combination of detail, transparency, freedom from noise, and natural musicality. The damping of the record seems nearly perfect, without any loss of life and dynamics, or any noticeable addition of coloration—problems that emerge to a slight degree in the regular Star Sapphire, and to a significant degree in the regular SOTA Sapphire without its Supermat and an appropriate clamp.

The vacuum clamping also seems to
make a small but significant difference in
terms of the geometry presented to the
tonearm. Turntables without effective clamp-
ing are much more prone to at least mild record warp, which drives the tonearm up
and down as it tracks the record—a hill and
dale effect which adds unnecessary distor-
tion with all cartridges. While the VPI,
Oracle, and Goldmund largely solve this
problem with mechanical clamps, they do
not solve it as well.

There is no change in the character of
the sound from the outside to inside of the
groove, as often happens on turntables—
like the Linn and AR—which lack an effec-
tive clamping system. Further, the SOTA
Star Sapphire does a better job of keeping
the record flat all over its surface. The VPI,
Oracle, and Goldmund never permit you to
set up as consistent a cartridge azimuth ad-
justment with as wide a range of records as
does the SOTA Star Sapphire; clampless
designs like the Linn and Pink Triangle
don’t even come close. With today’s stylus
designs and straightline tonearms, this
superior geometry seems to result in
notably more transparent sound.

The noise floor and dynamics of the
SOTA Star Sapphire and acrylic Supermat
are very good without any accessions, but
adding the SOTA Electronic Flywheel or
VPI Powerline Conditioner produces the
best noise floor and long-term speed stabili-
ty I have heard, except for a few custom-
made models not available to the public.

The difference between the Star Sapphire
and the other contenders is small, but
nevertheless noticeable after prolonged
listening; it is worth considering for those
who seek the very best.

As for overall sound character, the SOTA
Star Sapphire and VPI HW-19 II both have
excellent bass, equal to the best high-mass
Japanese designs and to the most expensive
Goldmunds. The VPI may be slightly better
than the SOTA in terms of its resolution of
deeb bass, but the SOTA Star Sapphire
experiences no loss of low bass, as do the
Oracle Delphi and virtually all British suspen-
sion turntables.

The SOTA Star Sapphire and acrylic Super-
mat combination suffers no loss or exag-
geration of detail or timbre in the critical
transition area from midbass to midrange.
The sweet, open midbass is slightly less
dynamic or "live" than that of the VPI
HW-19, but the difference is small, and the
issue of accuracy is one no one can honestly
resolve; both seem equally convincing.

This corrects a chronic weakness in the
SOTA Sapphire and regular Star Sapphire.
The Star Sapphire/acrylic Supermat com-
bination provides clean, flat, detailed upper
midrange and treble without any hardness
or ‘etching’ of low-level harmonics. The
result is worth hearing if you have criticized
other SOTAs in this regard. Some audiophiles
may find the resulting upper octave balance
a bit "mid-hall," but few are likely
to criticize it. The result is well-suited to
most records and cartridges, and still seems
to preserve timbral accuracy (at least to the
extent that you can judge by comparing the
turntable to the same performance on CD).

The speed adjustments and ergonomics
are also good—with the exception of a low
and clumsy dustcover which is incompati-
ble with many of the best tonearms. The
vacuum pump is very quiet and acceptably
styled. The cabinet work can be very good,
although there is some sample-to-sample
variation. Check your sample for quality
before buying it.

Further, the various SOTA models remain
freer of acoustic breakthrough problems
under real-world installation conditions
than any other turntables I know of—at any
price. This is critical in many listening
rooms, particularly where the turntable
must be in the same room as full-range
speakers. The VPI, Oracles, and Gold-
mund are also quite good in terms of
acoustic breakthrough, but never quite as
good in difficult rooms. Most British turn-
tables—including the Linn and Pink Triangle
—simply don’t come close.

Most of these advantages are retained
even if you do not buy the VPI Powerline
Conditioner or the SOTA Electronic Fly-
wheel. Either accessory does, however,
make a significant difference. This differ-
cence is hard to explain in terms of measure-
ment, and only shows up after prolonged
listening, but it is reflected in the superior
apparent signal-to-noise ratio I mentioned
earlier, and in what I can only call long term
"stability." The improvement is not simply a matter of wow and flutter, speed variation, or pitch—at least to the extent ordinary test gear reveals. It is rather a feeling of almost subconscious credibility: the music seems to emerge without a degree of low-level mechanical change that's otherwise present. For some reason, record surface noise is also reduced; I don't know why, but it is.

As for the choice between the SOTA Electronic Flywheel and VPI Powerline Conditioner: I prefer the VPI because it produces virtually the same sonic effect as the Electronic Flywheel, but is a lot smaller and can be used with most other turntables, and some CD players. While some audiophiles may like two large boxes worth of outboard equipment (the pump and electronic flywheel), I don't. If you want an all-SOTA approach, however, rest assured that only the tweakiest of audiophiles will hear the difference. Don't use both devices; it improves nothing. If you already own one, there is no reason to buy the other.

I only recommend the SOTA in its current version with the acrylic Supermat. The older SOTA Star Sapphire simply did not have the same neutrality. It seemed to lose upper octave detail and overdamp the record; too much of the music's life is lost. The regular SOTA Sapphire now shows its age. It is still a very good turntable, but the warmth in the upper bass and lower midrange, and loss of air and life in the highs, are significant. The VPI HW-19 II is superior to both the SOTA Sapphire and Star Sapphire without its Supermat. Many other turntables now make up for their inferior low bass and vulnerability to acoustic breakthrough by providing linearity, air, and dynamics superior to the "regular" SOTAs.

Adding the regular acrylic Supermat ($135) and Reflex Clamp ($95) to the SOTA Sapphire makes a major improvement, but also raises the price to about $1130, and the VPI HW-19 II still provides slightly more linearity over the entire frequency range and slightly more realistic dynamic contrasts. Fortunately, present owners of the SOTA Sapphire can deal with this problem, although at a price: they can convert any Sapphire to vacuum clamping for $600.

The VPI HW-19 Mark II: A Superb Reference For Only $885

You will already have gathered that I feel the VPI HW-19 II is a superb turntable. Let me go further: I feel it is unquestionably the best buy in high-end turntables, very close to the SOTA Star Sapphire/acrylic Supermat combination. Harry Weisfeld continues to make steady improvements: the Mark II has an improved turntable platter, a better belt, a slightly better motor, and more shock-resistant tuning of its suspension. You can also buy a acrylic top plate ($115) that improves the VPI's looks and produces slightly more life and air. If you want to gild the lily, buy the new VPI Power Line Conditioner ($300): it makes the same improvement in the HW-19 II's stability and signal-to-noise ratio as it does in the SOTA's.
The HW-19 II retains all of the virtues I described in my original review (Vol. 8, No. 4). It is now, however, more than "a straightforward turntable design that offers you a solid middle ground between the sonic virtues of the SOTA and the Oracle." It sounds better in enough small ways to clearly outperform the SOTA Sapphire, even with Supermat. The VPI provides better and more extended bass than the Oracle Delphi II, better dynamics and musical life, and equally good upper octaves. The HW-19 II is equivalent to any of the Goldmunds I've heard, although I can't speak for the latest production runs.

The HW-19 II also continues to improve in finish. It now matches the SOTA in quality of styling, although neither approaches the superb sculpture-like look of the Oracle Delphi II. It also remains easy to set up—perhaps the easiest of all turntables for anyone wanting to swap arms. Suspension adjustments are only needed for a few of the very heaviest arms; and the HW-19 II stays set up if moved. It can be moved without tightening of bearing retainers or special shimming.

Only the SOTAs, and possibly the Goldmund Reference, exceed the VPI HW-19's ability to perform well in virtually any location on virtually any furniture. Vulnerability to acoustic breakthrough is notoriously difficult to measure, but I generally move turntables into some of the standing wave areas in my listening room and let all hell break loose to see what feedback develops. The HW-19 II is now greatly improved over the early models of the HW-19; it's highly resistant to acoustic feedback.

As for features, the VPI HW-19 Mark II uses a heavy duty AC synchronous motor with good compatibility to any 60-Hz line, and has enough torque for fast start-up and avoidance of stylus or record-brush drag problems. I wouldn't say that its powerline compatibility is audibly better than the SOTAs or Oracle Delphi II's in any way—I played around for some time with some trick computer power supplies to vary voltage and frequency supply, and all three did very well indeed. The point is that they did do splendidly. Other turntable designs give you slight changes in sound character with even small shifts in AC line quality.

You get a superb platter with the HW-19 II, with no charges for deluxe mats. The platter is machined from a block of 1”-thick acrylic with a six pound ring of lead on the bottom. VPI claims it's equivalent to a twenty pound aluminum platter. More importantly, the VPI platter follows the precedent set by Goldmund, and now the SOTA Supermats: it uses a platter whose surface material roughly matches record vinyl, which allows tight clamping and damping of the record without air pockets or resonance. The lead weighting is heavy enough to provide good speed stability, feedback resistance, and excellent bass.

The VPI also uses a clamping system which may help explain its sonic superiority to the regular SOTA Sapphires and Oracle Delphi II. The spindle is threaded; a small, internally-threaded knob screws down over a plastic clamp that locks the record to the surface better than the Goldmund or Oracle devices. It's surpassed only by the SOTA vacuum system. The result is excellent coupling of the record to the turntable, and a remarkably flat playing surface. The VPI HW-19 II seems to do a better job of damping external resonance than the SOTA Star Vacuum without Supermat—a considerable tribute to the quality of the VPI design.

Like all good turntables, you get a well-machined spindle and bearing. If you raise the turntable up on wooden blocks, you can even, from the bottom, alter the bearing height for VTA/SRA adjustment. If this sounds a bit inconvenient, it is superior to trying to guess at the height adjustment of tonearms without a precise VTA/SRA adjustment, is slightly superior in terms of geometry, and allows you to make adjustments while the record is playing—with any tonearm.

The VPI uses a very heavy (30 lb) floating chassis with two layers of 10-gauge steel

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2 If only Stereophile had an in-house graphic artist, the illustration of AHC lying on his back adjusting the VPI platter up and down to get the right VTA would be priceless. An alternative would be to have an automotive hoist installed in your living room to make the job of getting underneath the VPI a little easier.

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LA

Stereophile
bent and welded together. It is as well damped as any other turntable I've tried to excite in my living room—-including the super high-mass Micro Seikis. The base is ¾” solid walnut, and the overall result is the heaviest and best-built suspension-turntable assembly I've seen for under $2000.

Like the SOTA, VPI uses a four-point suspension. It is tuned to about 3.5 eps (Hz), VPI feels this makes it resistant to building vibration, subsonic air conditioning noise, etc. The fact remains, however, that the SOTAs seem more immune to such effects, and can take far more furniture movement. The SOTAs are so good in this respect that they remain the product of choice for anyone who has problems with furniture movement and vibration, or floor movement and room vibration.

I have already described many of the sonic differences between the VPI HW-19 II and the SOTAs. I should emphasize, however, that the best turntables are very hard to characterize sonically, except in general terms. So much is dependent on the interaction between the elements of the turntable system, including cartridge, arm, tonearm mounting board, and placement, that there is no clear way to separate the sound of a turntable from the other variables.

In broad terms, however, the VPI is very flat from deep bass to the highest octaves. It is live and dynamic, without exaggeration or the kind of presence-region rise that I still hear in the Linn. It reaffirms the importance of a top-quality turntable by sharply reducing what most of us think of as record noise, and by providing most of the real-world advantages in signal-to-noise and dynamic range available from the best compact discs. With the exception of the SOTA Star Sapphire with the acrylic Supermat, it is the most consistently neutral and musical turntable that I have heard.

As for soundstage, the HW-19 II is as good as you can get. It allows records to provide notably more natural depth and hall effects than the Oracle Delphi II, which tends to bring performances slightly forward. The SOTA sounds slightly farther back in the hall, and its soundstage is slightly smaller and not quite as good in depth. Cartridge and tonearm differences in both timbre and soundstage are clearly revealed.

Only the SOTA Star Sapphire/Supermat combination is occasionally more transparent; this seems to occur in those cases where vacuum clamping has a special advantage. The Oracle Delphi II occasionally seems more detailed in the highs, but this may be more a function of its loss of deep-bass information rather than better resolution in the highs.

The VPI HW-19 II not only has more convincing and solid bass than the Delphi—the latest version of the HW-19 II provides a bit more smoothness than the Oracle Delphi II, and slightly more convincing midrange dynamics. This is a reversal of VPI's midrange performance before the HW-19 II appeared. The VPI's upper octaves are distinctly better than the "live," but less detailed, upper midrange and highs of the Linn, and the VPI's bass pitch is far more convincing than that of the Pink Triangle.

I have already mentioned the Powerline Conditioner in discussing the SOTA. Once again, it is a useful accessory, but not a vital one. The $300 cost is only worth it for audio purists, those who need a wide range of speed variations (including all flavors of "78" RPM), those with real powerline problems, or who are exceptionally sensitive to pitch or speed variations.

The VPI Powerline Conditioner eliminates the impact of transient voltage spikes, low-level voltage swings, RFI, and short-term frequency variations, by substituting a digitally generated waveform for the standard sinewave from your power company. It stabilizes voltage inputs of 70 to 140 volts at 125 volts, and has a front panel frequency control that varies turntable speed from 50 to 99.9 Hz within 0.02%. Even if you have a good AC line, the Powerline Conditioner will still help lower the apparent turntable noise level, improve the bass and transient attack, and open up the soundstage slightly. It can be used with most other turntables and CD players, provided they draw no more than 25 watts.

To sum up, the improved HW-19 II is the

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"affordable" choice in high-end turntables. It costs about half as much as the SOTA Star. Sapphire with the acrylic Supermat, outperforms the Oracle Delphi II, and is at least as good as the versions of the Goldmund Studio I have heard so far. I would not sell my grandmother, BMW, or another top-ranking turntable to buy one, but if you’re looking for a new turntable, this is a product I’d be sure to audition.

The Oracle Delphi II: A Turntable and Work of Art For $1250

This brings us to the Oracle Delphi, and if it has come up third in this review, I should again stress that the sonic differences are slight. The Oracle Delphi II is also a visually stunning product, retaining a level of styling that, in my view, has never been equalled by any other audio component. It also adds enough sonic improvements to the original Delphi that it ranks close to the VPI HW-19, and is superior, in naturalness of sound quality, to the SOTA Sapphire.

These improvements include much easier setup procedures (although far more fuss and bother than the SOTAs and VPI), and a better motor, suspension, and top plate. Earlier Delphi motors were noisy or had quality-control problems. Some had audible long-term wow. The DC motor on the Delphi II is now a Pabst motor, the motor first used on the $2500 Oracle Pre-

miere; its drive is smoothed by a capacitor bank, and the motor has a one-lb flywheel carefully balanced at the factory; the inertia provides better speed accuracy.

The Delphi II uses a slightly thicker base, and has a new spring suspension system which does a better job of preventing acoustic breakthrough. It also uses a new molybdenum disulphate oil. I can’t advise you on the merits of each of these features, but the overall result is significant. Anyone who, in the past, found the Delphi to have wow and flutter problems, or vulnerability to furniture vibration or floorboard movement, will find it has improved significantly. The SOTA and VPI are better, but not by much.

Audiophiles who change tonearms can now select the precise set of springs to tune the turntable to a particular tonearm, and the instructions for doing so are now very well-written indeed. Audiophiles will be equally pleased by the combined cartridge alignment protractor and stroboscope for setting turntable speed, which can be set precisely at the back of the turntable.

As for the sound, the only real weakness lies in a loss of deep bass, and a problem with record damping: the Delphi II cannot damp the record without losing a slight amount of life and dynamics. Like most freely floating suspension turntables I have tested, the Oracle tends to reduce bass energy in comparison with other designs. Unlike the Linn, however, it also seems to
lose a slight amount of natural midrange life or dynamics. This can be minimized by use of the manufacturer’s metal tonearm mounting plate, clamping it as hard as possible to the turntable subchassis. The tonearm mounting should, however, be filled with a \( \frac{1}{8}'' - \frac{1}{4}'' \) layer of mortite under the plate. Without such damping, the metal plate tends to rob the sound of some of the sweetness provided by the acrylic tonearm mounting plate (which cannot be rigidly clamped).

Otherwise, the Delphi II provides an exceptionally neutral and musical sound. The speed regulation and stability problems common to many belt-driven turntables are minimal, and the Delphi II provides consistently more musical low-level harmonic and transient information from the midrange up than most competing designs. The soundstage and imaging are stable and musically convincing, though a bit lacking in depth. The dynamics and musical life may not equal the very best, but they have excellent transparency, with little of the hardness or extra record noise common to most competing designs.

In fact, the slight loss of dynamics may have its advantages. The Oracle Delphi II is very easy and pleasurable to listen to because of its sweet and unfatiguing upper midrange and highs. Its midrange coherence—the ability to provide a consistently musical and convincing sound over very long periods of time—rivals any turntable at any price.

In short, the Oracle Delphi II is the kind of turntable that makes many audiophiles feel that analog disc is still the most pleasurable source of music in the home. It does impose some tradeoffs between exceptional sweetness in the upper midrange and upper octaves, and a reduction of energy in the lower bass, but none of the competition is free of tradeoffs. The Delphi II can give you years of musical pleasure and excitement.

Making Your Decision to Buy
I have not heard all of the world’s turntables, and other manufacturers constantly improve their products. I’d listen to the latest Entec Granite and Goldmunds before I made my own choice. You should regard my comments strictly as a guide for your own auditioning.

I would also stress that you should never buy a turntable except as part of a carefully considered front-end “system.” Always listen in depth to your preferred combination of turntable, cartridge, and arm before you buy in this price range. You should be able to hear your arm and cartridge with the turntable you’re considering buying. This may take some time, but it’s worth it: a dealer’s arm and cartridge can sound different because of setup, and changes in cartridge and tonearm. You should, however, consider a new cartridge or tone arm if your dealer can clearly demonstrate its merits. You are, after all, in search of synergy, and an old arm or worn cartridge may make it impossible to audition anything fairly.

I also advise close inspection of the specific turntable you buy and insistence on a return or exchange privilege. The high-end turntable business is filled with products made in small production runs, and many involve hand finishing. Listen for audible wow and rumble, and check your unit at the dealer’s to make sure you do not start out with problems in mechanics or finish.

I’d push hard for a home trial if your dealer is exceptionally tolerant. While acute wow and flutter, rumble, and speed stability problems will be apparent at the dealer, low-level problems often show up only after a week or so. It’s rough on the dealer, but I’d generally insist on a swap of any turntable with a problem, not repair. It’s difficult or even impossible to fix many of the minor sound problems in turntables without a whole new platter or bearing assembly, even then the result may not be as good as a factory fit.

As for setup and system integration, a further improvement in the bass is possible with virtually all turntables by replacing the standard feet with spiked feet or Tiptoes. These will “fix” the turntable firmly to cabinet or shelf. This seems to consistently improve the clarity and “life” of the bass and lower midrange.

The SOTA, VPI, and Delphi also work
synergistically with the new air bearing arms. The Eminent Technology Two, for example, provided outstanding performance with all three turntables (there is a special mounting kit for the Oracle). In fact, I'd urge you to audition this combination. I've not had the opportunity to test the new SME or the latest Goldmund arms in my system, but the few people I know who've experimented have all felt the Eminent Technology to be at least as good, and $700 to $2200 cheaper.

More generally, tonearm choice is at least as important as turntable choice. The tonearm often has more immediate effect on sound quality than the relatively small sonic differences that emerge between turntables like the VPI, SOTA, and Oracle. A tonearm produces more shifts in the midrange in terms of speed, resonant coloration, and soundstage characteristics. Tonearm choice can also be critical in terms of bass performance—few tonearms can really reproduce the deep bass.

Make sure the cartridge you love will work well with the tonearm you love in the turntable you choose. Ironically, the best tonearm I know in terms of the ability to switch cartridges (the Dynavector 507 with the Grado or Audioquest plug-in heads and a top quality tonearm interconnect) will only work on the VPI. While it's a more minor point, the SOTA's dust cover will not clear many tonearms; the optional dust cover on the VPI ($40) will clear virtually all tonearms.

Most turntable designers are also beginning to discover that the tonearm mounting board material can make a surprising amount of difference. Wood and composites usually produce a damped, controlled sound with good bass and the impression of some loss in transients, dynamics, and life. Heavy plastic can give you more transient life, dynamics, and bass, but the VPI turntable is the only one I've found so far where the acrylic plate is better than the metal. Metal mounting plates tend to give you lots of life and bass energy but also a touch of hardness, resonance noise, and exaggerated dynamics. Mortite helps in some cases, but not all. The Oracle Delphi provides the benefits of a metal plate without added resonance or loss of bass control.

I've tried a lot of so-called isolation boards that fit under the turntable. Some help with lighter suspension turntables like the Linn or AR, but none helped consistently with these top-ranked turntables. Placement turned out to be far more important than special isolation boards.

The VPI, SOTAs, and Oracle have relatively low vulnerability to acoustic breakthrough, but I have heard slight improvements in transparency and bass by moving them a few inches further away from the wall or by shifting them over the surface of vibrating furniture. Placement in an area away from standing waves or high bass energy nodes will improve their sound more significantly.

And Now for the Gentle Art of Prophecy

I can't tell you whether another manufacturer will come out with a better turntable tomorrow. I can tell you, however, that all three of the products that are the focus of this review outperform any of their British rivals that I have yet heard, as well as the Japanese competition that has come my way. I feel safe in predicting that each will produce many years of excellent performance—and that any serious audiophile will still need a good turntable in 1996, regardless of what happens with CD, DAT, PAC-MAN, or what have you. Serious music collectors and listeners will need access to records for many years to come.

If you've gotten over the initial shock of CD, it may well be time for a SOTA Star Sapphire and acrylic Supermat, a VPI HW-19 II, a Delphi Oracle II—or an Entec Granite or Goldmund. After all, CD players lack sport. You plug them in and have nothing to do! A beautiful turntable is a toy forever!

Notes

I should note that while it has been easy for me to obtain the latest models of most turntables, I have not had the loan of the Granite, the latest Goldmunds, or of the most expensive Micro-Seiki to try in my own system. My comments on them are based on listening to these units in friends' systems. Nor have I tried the Michell
THE FOSGATE 3601 SURROUND SOUND DECODER

J. Gordon Holt

Full-logic surround-sound decoder with stereo synthesis and fixed rear delay. Frequency response: +0, -1dB, 5 to 40,000 Hz. THD: 0.05% front, 0.5% rear. Dimensions: 17 3/4" W by 2 1/2" H by 9" D. Price: $550; $625 with wired remote. MANUFACTURER: Fosgate Research, Inc., PO Box 70, Heber City, UT 84032.

Publisher's note:
This review should have been published with Bill Sommerwerck's reviews of three surround-sound decoders in our last issue. An earlier version of the Fosgate 3601 was reviewed in that survey. JGH comes at surround from a somewhat different perspective, though, and a lot of experience.

Anyone who has ever watched a blockbuster film at home with a high-quality audio system and full surround sound will find it difficult to ever again enjoy it in ordinary stereo. Surround-sound effects can put the snarling leopard somewhere behind you, or surround you with forest fauna, or street traffic, or a howling blizzard. It can immerse you in the scene, greatly increasing your involvement with and enjoyment of the film. Home-type surround-sound decoders have been available for several years now, but the latest crop of them, from SS1, Fosgate, Phoenix Systems, Shure, and Aphex, are much more sophisticated than their predecessors.

One of the more expensive units available, the Fosgate 3601 is a full-featured SS decoder intended primarily for the extraction of rear-channel information from Dolby Stereo-encoded film sound tracks, but also including provision for spatial enhancement of monophonic and conventional stereo sources.

The 3601 bears the Dolby Surround logo on its front panel, indicating compliance with all of Dolby's requirements for S-S reproduction: L-R matrixing, a rear-channel delay, rear HF filtering above 7 kHz, and modified Dolby B noise reduction for the rear signal. The 3601 also includes a refinement which Dolby licensing for home applications does not require, but which is nonetheless used in most theaters equipped for showing Dolby Stereo films: so-called logic steering.

Logic steering is a technique for enhancing the apparent separation of multichannel matrixed program material, through automatic computation of where a signal belongs on the basis of its distribution between opposite (left/right, front/rear) and adjacent (left/front, front/right) channels.

Stereophile
Program material sensed to be unwanted in a given channel is extracted and added, out-of-phase, to what appears in that channel, to cancel the unwanted material. (Another way of accomplishing much the same thing is by "gain riding," where channel dominance at any given moment is established by boosting gain in the desired channel, and reducing gain in the channels carrying material that doesn't belong in them.)

Fosgate's optional remote control unit for the 3601 is rudimentary. It is a wired type which plugs into the rear of the decoder, deactivating its front-panel Output Volume and Front/Rear Balance controls. The remote's cable is 20 feet long, and the remote itself has only master volume and front/back balance controls on it. It does, however, include two rows of LEDs to show (in the dark) the control settings. The only thing I really missed on Fosgate's remote unit, after using the Surround Sound 720 (to be reviewed in a future issue), is a mute switch. Anyone into video at all knows what a perverse pleasure it is to zap out the sound during commercials and some film lead-ins.

Most of the 3601's operating controls are on the front panel of the decoder. These include switches for Tape Monitor, Bypass, Dolby Surround, Ambience, Panorama, (stereo-synthesized) Mono, Center Channel, and AC power. Potentiometers are for input level, input balance, surround sensitivity, bass equalizer (front-channel boost centered at 40 Hz), and output balance. LEDs indicate input-signal balance, proper input signal level, AC on, and surround-sound activity. There are also internal presets for front and rear, left and right, and front-center levels.

The Ambience and Panorama switches provide L-R ambience extraction from conventional, un-encoded stereo sources. The Ambience mode has no effect on front-channel soundstaging, but separates out the hall ambience (derived from the recording, not synthesized) and routes it to the rear. The Panorama mode spreads the entire stereo image outward and toward the rear, acting to wrap the soundstage around the listener, while feeding stereo ambience to the rear. I emphasize the "stereo" here because the Fosgate 3601 is the only surround decoder I have found that can provide a stereo rear signal, although it does this only in its Panorama mode (about which more later).

The Mono switch combines the two input channels, then mixes into them a controlled amount of out-of-phase signal to broaden the apparent soundstage. Some of that out-of-phase signal is also fed to the rear, although not through the delay line. The delay is operative only in the Dolby Surround mode, where it serves to further increase the apparent front/back separation.

For large-screen video projection systems, it is recommended that a center-channel loudspeaker be located directly beneath the screen. Driven by its own mono amplifier from a special switch-selected output on the 3601, this serves to anchor dialogue firmly at the center of the screen, which is the way all stereo film tracks are supposed to be reproduced. All dialogue is mixed as L+R information, and when the 3601's Center switch is depressed, this information is extracted from the L and R channels for delivery to the center speaker, allowing the L and R speakers to be widely spaced for maximum spatial effect without sacrificing dialogue localization. Note, however, that if there is no center speaker, depressing the Center switch will remove most of the dialogue from the front-channel signals.

The bass control provides up to 18 dB of boost centered at 40 Hz—and is very useful for film soundtracks, many of which lack the bottom heft we are accustomed to hearing on a good theatre sound system. Nearly all linear-track videocassettes need low-end boosting, as do many LaserVision discs.

As of this writing, the Fosgate 3601 is the only full-logic surround decoder that includes its own built-in power amplifiers. Surprisingly clean-sounding for critical listening through good speakers, they are better than one needs for the rear surrounds. But their 40 watts/channel power may not be adequate under certain conditions.

Some surround-encoded program material has strong, deep bass assigned to the rear (Close Encounters is one of these),
so if you are inclined to listen to film tracks at movie-theater-type levels of up to 108 dB, these amplifiers just won't do the job. You'll need a minimum of 60 watts per channel. If you can hold your listening levels to below that, Fosgate's rear-channel amps will be at least adequate. (Any reasonably good small-box systems will do fine at the rear, but Technics' little SB-R100 "honeycomb disc" speakers are ideal, as they not only sound good but can also be wall-mounted.) Rear-channel line outputs are provided on the 3601 for the amplifier of your choice.

Before trying this decoder with my (borrowed) projection video system, which has a less than superb audio setup right now, I auditioned the 3601's front channels through my reference audio system, at that time consisting of Infinity RS-11s driven by Conrad Johnson Premier Five amplifiers on the high end and an Electron Kinetics Eagle 2 on the bass. Unlike the Fosgate's previous decoder, the 101A, the 3601 has virtually no effect on the sound through the main channels. Only a very subtle dryness is added to the sound, not nearly enough to roughen it or add overt edginess. The difference between a straight-in signal and that coming out of the main front channels was so slight that it was noticeable only with prolonged listening, and not on direct bypass comparison. It was easy to ignore, and, needless to say, not at all audible through the video system's speakers and amps.

On good Dolby Surround material, stereo separation in all directions was subjectively complete; the imaging sounded almost like a discrete four-channel source. The (fixed) rear delay was unnecessary most of the time, as one could sit right next to a rear speaker and still hear no dialogue leaking through it. But not all films behaved that well; some, which had more HF output in one front channel than the other, provided incomplete rear cancellation, and it is almost certain that the resulting slight sibilance from the rear speakers would have been more obtrusive had there been no rear delay.

One thing that really amazed me was the spaciousness of the rear sound field. I mentioned earlier the 3601's independent rear outputs: in both the Ambience and Dolby Surround modes, the rear outputs are identical (mono) signals, but are are out of phase with one another. That misphasing prevents the rear signal from ever producing a firm center image, but since rear effects are rarely supposed to be centered, this is hardly relevant. More importantly, the misphasing acts to "open up" the rear, producing a wide panorama of sound from all ambient effects, which is particularly effective for such environmental sounds as rain, wind, forest birds, and so on.

The rear speakers are, however, in phase with the front speakers.1 and this allows panned effects to image with remarkable specificity at the sides of the room, which is something you rarely hear even in theater sound systems. The 3601 is literally capable of zooming a sound right over your shoulder—a startling experience, to say the least. This device produced the most impressive surround effects I have ever heard from films.

The Ambience mode, for L-R extraction from stereo recordings, was less effective, but still produced a real feeling of space around me. With most recordings, the rears had to be kept at a very low level to prevent front sounds from being audible from them. I have a feeling rear delay would help here, but, in the Ambience mode, there is no way of switching it in. But even a barely audible rear signal added a surprising amount of warmth and spaciousness to the sound, and made instruments sound more natural. I felt it to be substantially more realistic than the "raw" stereo. O heresy!

As for the Panorama mode, I could never decide whether or not I liked it. Partly because of the stereo rear, this mode gave a more spacious presentation of stereo recordings than did the Ambience mode; along

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1 If you are wondering how they can be out of phase with each other but in-phase with both front speakers, remember how their signal is derived by L-R subtraction. The rear signal is mono, and represents the sum of a plus Front Left and a minus (reversed-polarity) Front Right. If this mono signal were fed in-phase to both rear speakers, it would be in-phase with the left front speaker and out of phase with the right front speaker. Reversing the connections to the right rear speaker puts the rear speakers out of phase with each other but in-phase with their respective front speakers. While!
with a dramatic increase in the "roundness" of instrumental sounds, but it shot the frontal soundstage down in flames! Violins were out to the left of the left speaker, cellos and basses were similarly extended to the right, and everything else across the front was stretched to about three times its normal width. A piano sounded as wide as a pipe organ! The effect was very impressive, and lots of fun with pop music, but ludicrous with classical material.

I shouldn't have been too surprised, however, to find that the Panorama mode did fairly well with SQ-encoded recordings (which include most recent-vintage EMI classics). They may not have localized exactly as intended, but they sounded very convincing nonetheless, with good localization of panned sources at left/right rear as well as to the sides. Many SQs sounded almost like discrete four-channel recordings!

In summary: The Fosgate 3601 is the best surround-sound decoder I've had the pleasure of using, and it's the fourth I've tried.

Addendum:

After reviewing the Shure HTS-5000, I have to say that the Fosgate and Shure must vie with one another for top honors. BS, in "Three Surround Sound Decoders" (Vol. 9, No. 2), preferred the Shure over an early version of the Fosgate. Though I think my Fosgate is quite a bit better than BS thought his, I am still leaning toward the Shure, though the difference is small.

—JGH

Further Addendum:

Jim Fosgate took such strong issue with two of our conclusions about the 3601 that he invited JGH to visit him in Heber City, Utah for a first-hand demo of what the 3601 can do. —JGH accepted.

Heber City, home of Fosgate Research, is a small town (pop. 8000) about 20 minutes' drive from Salt Lake City, and geographically isolated from it by a range of picturesque snow-capped mountain peaks. Like the proverbial town that time forgot, Heber City is laid-back, quiet, and almost completely free from the crime, pollution, and mutual suspicion that afflict every big city in the U.S. It doesn't even have a fast-food facility—no golden arches.

The Fosgate factory and offices occupy a modest single-story frame building half a block off the town's shopping thoroughfare. All the design work is done several miles away in Jim Fosgate's home—a three-level frame structure nestled on the side of a hill overlooking a quiet wooded valley complete with meandering stream.

Half the bottom level of Fosgate's home is a "lab" with a test bench, two large drafting tables, and myriad assorted but neatly organized bins and shelves of resistors, capacitors, hardware, and a number of breadboarded prototype devices, not to mention a plethora of old amplifiers, power supplies, and unidentifiable electronic doodads. Jim is an avid collector of electronic memorabilia; his garage is a veritable treasure trove of classic tube amplifiers (many in working order), early loudspeakers and film projectors, and working mockups of audio gadgets that may or may not be produced in the future.

The other half of the lowest level is an acoustically treated room about 13 by 16 feet, equipped as a small screening room with a Kloss Model 2 projection TV system and six of Fosgate's own loudspeaker systems. The main speakers, located in the room corners, were unusual-looking modular units, each consisting of a rather squat woofer section (transmission-line loaded) topped with a separate mid/high module containing an 8-inch Gauss cone driver with a Helix tweeter on top, and mounted together on a gracefully contoured open-back baffle that reminded me of a primitive African sculpture of a bust. Under the projection screen was a subwoofer module the size of a large coffee table, topped by another mid/high module. The amplifiers were modified Heath 5s—that's right, tube power amps.

Bill Sommerwerck's report on the 3601 (Vol. 9, No. 2) had faulted it on several counts, one of which (a slightly steep high end) has already been solved in the latest version of the 3601 (the one I have reviewed above). The other three—the inability to
produce firm sidewall images or a continuous ambient field, and a thinning of bass response from the front side channels when the center channel is switched in—remained as points of disagreement with Fosgate, whose aim now was to prove to me that they were not valid criticisms.

At the start of the listening tests, I was impressed with what I heard but not much more. Being completely unfamiliar with the sound of the room and all the equipment in it, it was some hours before I could begin to listen through the unfamiliar system to what one specific component—the 3601—was doing.

Like most other surround-sound decoders, the Fosgate 3601 is marketed primarily as a device for use with video systems, to extract the Dolby-encoded surround information that, in movie theaters, is fed to loudspeakers ranged around the back of the seating area. Thus, it was the 3601's performance as a Dolby surround decoder that I was most interested in. Jim, however, seemed bent on proving to me how much better it performed with films when operated in what Fosgate calls its "Panorama" mode.

Conventional Dolby surround provides only a mono signal for the rear speakers. Thus, while it can throw a small image to the rear, it is inherently incapable of providing a convincing spatial field across the back. Fosgate's Panorama mode, intended to correct this deficiency, is the only one in which the 3601 provides full channel separation at the rear. The Panorama mode expands the L-R difference signal in the stereo source in a manner not unlike that of Carver's Holographic Generator. This difference-signal boosting acts to increase front-channel stereo separation, thus widening the apparent soundstage, but the addition of rear channels "pulls" the front signals towards the rear of the room, providing a wrap-around effect that some people (Jim Fosgate) find exciting, and about which others (me) have mixed feelings.

The Panorama effect has no place in high fidelity, as it completely changes the stereo staging of the recording, and has a tendency to exaggerate the width of frontal images. Even Jim admits it is not recommended for minimally-miked classical recordings whose object is to recreate an actual musical event. But with multi-miked and panned pop recordings, where startling effects rather than realism are the goal, Panorama mode throws some sound sources all the way to the rear left or right, as well as to intermediate locations to the sides. Yes, I did hear solid imaging at the sides, between the front and rear speakers, which is one of the things both BS and I have reported the 3601 unable to do.

Most remarkably, the rear images were solid and definite—so much so that I could turn and face either rear corner and hear no front sounds at all coming from the rear. Separation was almost as complete as from a discrete four-channel system! (A prototype decoder, with digital logic, produced even more impressive front/rear separation. It's slated for future production.)

My reaction to the Panorama mode was ambiguous with Dolby-surround-encoded film material. As Fosgate pointed out, few producers take full advantage of the system's capability, utilizing it only occasionally like an exclamation mark, rather than as a means for establishing an aural viewpoint. An example, which we auditioned at some length, was a scene from Romancing the Stone, where Douglas and Turner stand in a forest under heavy rain outside the shell of a downed aircraft. In Dolby surround mode, the rain sound is all across the front; the rear channel is unused. Only when they climb inside the craft is the surround channel switched on. The effect of the change, if one pays attention, is unnatural. In the Panorama mode, you are surrounded by the rain outdoors (another effect that both BS and I were unable to elicit from the 3601), while the sound from inside the craft is even more encompassing but also more muted (a drumming rather than splashing), because of the aircraft's intervening skin.

Parts of several other films were sampled, convincing me that the Panorama mode did add a great deal to the impact and excitement of most film sound tracks. The first part of Apocalypse Now, whose surround effects are more inadvertent than intentional (a result of random phase information), was hair-raising in Panorama mode,
much less so with Dolby decoding. But the added impact of the Panorama mode was often gained at the expense of audio/video directional congruence. Sound sources which were visible to left or right of center on-screen were audibly displaced by a greater angle off-center—something that an old-hand purist like myself found rather disturbing. (The fact that most home viewing of films with stereo sound and a small screen exaggerates this disparity even more is beside the point.) But for those not bothered by this, the Panorama mode envelops the listener/viewer so effectively in the sound field that one’s emotional involvement with the film can be even more complete than in a movie theater.

Fosgate’s instructions for the 3601 strongly advise the use of a front center channel, to keep dialogue anchored on the screen. Jim’s demo proved that this worked admirably, allowing anyone sitting ‘way off to one side of center to hear dialogue from the screen while stereo effects were spread from one side to the other and to the rear.

Neither BS nor I had been able to give this alternative hookup a fair try, because neither of us had on hand any small speakers whose middle and upper ranges were even similar to our side front speakers. But both of us noted what sounded like a moderate loss of low frequencies from the side channels when the Center button was activated. This was the one thing I was unable to check out at Fosgate’s, because Jim’s center speaker crossed over at the low end to the subwoofer it was perched atop. Switching the center in and out caused no detectable loss of lows, but the implication of this is questionable. The presence of a subwoofer, which is (I was told) fed from a conventional crossover network from the center channel, would imply that the center speaker is getting the full audio range. If true, this is a serious design error.

In home video systems, the center speaker must be physically small, since it must be placed above or (preferably) beneath the video screen, and smallness in a loudspeaker always goes with limited LF power-handling capability. Blockbuster films must be played with the audio quite loud (up to 105 dB on peaks from a seat in a movie theater) for their full impact, and there is often very strong bass on film sound tracks. Feeding the full low end to the center channel will cause overload of that channel. Period. (Very few systems will have a huge subwoofer like Fosgate’s to handle such bass.) The center channel output should have a high-pass crossover built into it, to limit the center signal’s low end to around 80 or 100 Hz.

In view of what I heard, it is necessary for us to revise our assessment of the Fosgate 3601. I was simply blown away by what I heard in Fosgate’s demo room; I almost suffered from sensory overload! Contrary to what I report above, and Bill reported earlier, the Fosgate 3601 can produce solid side imaging, can produce a convincing 360° ambient field (including sounds from overhead!). But it would appear that it cannot do these things under the same conditions that the Shure can—that is, with the front/rear speaker spacing appreciably greater than their left/right spacing. If we think of the front/rear space in the same terms as we normally think of left/right loudspeaker spacing (where increased stereo separation requires smaller speaker spacing in order to provide centerfill), this would seem to suggest that the Fosgate provides greater front/rear channel separation than does the Shure. Unfortunately, the logic action of both devices makes it impossible to verify this difference via steady-state measurements. But, subjectively at least, it appears that the Fosgate does best with the four speakers arranged in a square, while the Shure is better with front-to-rear spacing substantially greater than left-to-right spacing.

Which surround decoder would I name The Best? Frankly, I can’t decide. I still get better results from the Shure in my home than I can get from the 3601. On the other hand, I have not (as yet) gotten nearly as good performance in my home from either of them as I heard from the 3601 in Fosgate’s “screening room.” Although I find them both to be superb, I suspect that the next few years will produce surround-sound products—like the Fosgate digital processor mentioned above, or the new digital one from Sony—that provide both a closer approach to multi-channel reproduction and enhanced realism.
THE AUDIO RESEARCH SP-11
PREAMPLIFIER

J. Gordon Holt

Hybrid preamplifier with separate power supply. Inputs: Phono (high-gain MM), Tuner, CD, Video (sound only), Tape 1, Tape 2. Outputs: Tape 1, Tape 2, Main 1, Main 2, Invert, Direct. Controls: Gain, Level, Balance, Mode (Mono, Reverse, Stereo, Left, Right), Input (All but tape), Impedance (cartridge loading), Tape Monitor, Copy switch, Copy mode (1-2, 2-1), Manual Mute, Polarity (Invert/Normal), Bypass, Subsonic Filter. Frequency response: High level ±0.5 dB, 1 to 100,000 Hz, -3 dB at 0.2 and 250,000 Hz. Phono: ±0.2 dB RIAA accuracy, 20 to 40,000 Hz. Harmonic distortion: .005% @ 2 V out, 5 to 30,000 Hz (typically .001% midband). Gain: 30 dB line level, 76 dB phono. Noise: -110 dB 2 V out, gain down. Line Input: high level, gain max, 106 dB below 1 V in. Phono Input: 74 dB below 1 mV in. Dimensions: Power supply and Preamp: 19" W by 5½" H by 15½" D, overall, including front handles and rear interconnect clearance. Price: (Hold your breath!) $4900.


If there is indeed a renaissance of tubes in high-end audio—and it is clear there is—much of the blame lies with Audio Research Corporation.

Audio Research president William Johnson was custom-building tubed power amplifiers for the carriage trade as far back as 1949, which means he has been making tubed equipment at least as long as anyone else currently in audio. In 1951 he started a modest manufacturing enterprise called Electronic Industries, which was subsequently bought out (along with its proprietor and chief designer) in 1968 by...
Peploe, Inc., a marketing firm with an interest in "breaking into" the burgeoning audio market.

In 1970, Bill quit Peploe, bought back his patents from them, and restarted his own manufacturing facility under the name of Audio Research Corp. That was five years after the first solid-state audio electronics had started to appear; by 1970 there was hardly a single tubed component to be found in Stereo Review's annual Equipment Directory. (Actually, Audio Research wasn't even to be found in that Directory until the 1983 edition.)

ARC has always been unduly reticent about touting its own horn. With relatively few dealers nationwide: a modest, understated advertising campaign, and a commitment to an "obsolete" technology that everyone "knew" was dead (the old, overheating, mortal vacuum tube), Bill's products did not really begin to attract audiophile interest until The Absolute Sound "discovered" them in the mid '70s.

At that time, when even the best solid-state equipment was still doing nasty things at the high end, Bill's no-holds-barred tubed gear was a revelation! The embodiment of what we now think of as "the tube sound," they were rich, warm, liquid, and silky-smooth where the solid-state competition was stark, steely, wiry, taut, and lean, with an overlay of fuzzy grunde at the top. TAS's enthusiasm for this kind of sound was soon echoed by Stereophile, and suddenly ARC started getting the recognition it should have had all along.

The honeymoon lasted about two years. Presumably under pressure from his dealers to "come into the 20th century," Bill introduced two solid-state products: the SP-4 preamp and D-100 power amplifier. The dealers probably loved them, but TAS and Stereophile did not. I've related what happened elsewhere in this issue, so I won't reiterate. Suffice it to say it was not easy borrowing an SP-11 and two D-250s for my own tests, but it finally happened. The power amp will be reviewed in the next issue.

The SP-11 is a design departure for Audio Research. Like the Berning TF-10, it is neither a tube nor a solid-state preamp; rather, it is both at once. Each active stage is a combination of a triode tube and a FET—devices whose dynamic transfer (input/output) characteristics just happen to be very close to complementary. The result is an amplifying "stage" whose distortion is inherently lower than that of either a single tube or a single FET. (The distortion figures for the SP-11 are dramatically lower than for any other available tubed preamp.)

The control lineup on the SP-11 is awesome. The listing at the head of this report is pretty much self-explanatory, but some control functions need explaining. First, note that there are two "volume" controls—neither of them called that. One of these is ahead of all high-level amplifying circuitry, at which point its judicious use prevents input overload no matter how strong the signal. The second, just ahead of the output buffer, can prevent any background noise originating in the high level stages from being audible through very efficient loudspeakers or in extremely quiet rooms. No instructions were provided with our sample SP-11, but I would assume one initially adjusts the second control (called "Level") as high as one can without incurring any audible hiss, or, if noise is no problem, all the way up. The other control (called "Gain") should then be set so the listening volume is a few DB higher than it will be for most listening. The Level control is then used for subsequent volume adjustments.

Both volume controls are actually 32-position detented potentiometers, with the smooth, silky action I generally associate with Japanese products. (The Japanese are noted for their attention to ergonomics: designing things to interface well with people.) Oddly, however, the farther to the right across the SP-11's front panel you go, the worse the switch action. The "Impedance" switch has a truly abominable action. It's hard to turn, and the detents are so abrupt you have the feeling you're going to break something every time you operate it. (Which, thankfully, you won't have to very often.) This seems somehow out of character, from both the preamp's gorgeous appearance and Audio Research's reputation for luxurious quality.

The level-change increments of the
volume controls are quite large at reduced settings, becoming increasingly gradual as you turn them up until, near full-up, the increments drop to about \( \frac{1}{2} \) dB per step. For this reason, at least one control (preferably the "level") should be operated most of the time near its full-up position, the other turned down appropriately. Running both at about half rotation causes excessive incrementing, which will usually mean the volume setting you seek is halfway between one setting that's too loud and one that's too soft.

I should draw attention to the Mono position on the Mode switch. A boon to serious record collectors who still treasure many mono discs for their performances, this is a welcome inclusion on a preamp otherwise clearly aimed at people who play only the best, most recent recordings.

The "Impedance" switch isn't really that. It's a resistance switch, selecting different values of cartridge loading for MM cartridges and a variety of MCs. The preamp gain, by the way, is high enough, and its noise low enough, that it will work fine with any but the lowest-output MC cartridges, without the need for a signal-fouling step-up device. Thus, there is no sound quality sacrificed through one's choice of MC rather than MM cartridge.

The "Invert" switch is, of course, an absolute-phase (polarity reverse) switch. The Bypass switch bypasses essentially the balance control and the Mode switch (mono, stereo, stereo reverse, etc.). The Direct outputs bypass the polarity reverse switch, but you can still have reversed polarity by using the inverted outputs. The Direct outputs do make the sound a hair more transparent, but don't have as much effect as the Bypass switch.

The unit is extraordinarily quiet! With the moderately efficient Infinity RS-1Bs, and both volume controls all the way up (nothing plugged into the inputs), there is simply no noise from my listening seat. With my ear a couple of inches from the tweeter strip there was an exceedingly faint, smooth hiss—that was it. From phono, with inputs shorted, full up on both controls yielded a moderate amount of hum—primarily 120 Hz, and a bit less muted hiss—at a volume setting that would blow the system apart with a 1-millivolt MC cartridge feeding it. Yet there was never any evidence of strain when feeding the preamp with a typical 5-mV-output MM cartridge (the Shure V-15). That input stage must have truly astonishing head room!

Okay, okay. So what do you really get for your almost-$5000? Does it sound like what $5000 should sound like? Oh boy, does it!

First, it must be said that the SP-11, more even than most other preamps, does not like a cold start. After 15 minutes' warmup, it sounds very good—ho-hum. After an hour it starts to pull ahead, sonically, of any of its known competition. After two hours, it is head and shoulders better than anything I have ever heard!

This preamp sounds like nothing! The high-level section is the closest thing to a straight wire with gain that I have ever encountered. (I've heard capacitors that degrade the sound more than the SP-11!) Processing through the phono preamp seems to add nothing more. The sound is just simply neutral. It is indescribable. I can only lamely say that everything you think is superb about your present preamplifier won't be when you hear the SP-11. Highs are unbelievably sweet, delicate and effortless, yet superbly detailed and focused. Surface noise separates out from the music and becomes one-dimensional, assuming a degree of unobtrusiveness that I did not believe possible.

Bass, through phono and line-level inputs, is unobtrusive most of the time, but positively awesome when the music calls for it. (My initial reaction was that it is a little weak. I was just accustomed to it being a little loose.) Bass drum, foot poundings on a stage, subterranean hall rumble, and the deepest organ pipes are reproduced effortlessly and with a sense of power I had not heard from my system before (except when feeding CDs directly to the power amp).

It's all there—remarkable depth and soundstage breadth, stable, pinpoint imaging, prodigious inner detail without the false edge that often passes for detail—the most breathtakingly musical sound I have.
ever heard from any preamplifier. (I have heard a direct comparison between this and the SP-10. The 11 was noticeably better in every respect. I have asked myself this before, but I ask again: How much better can preamps, and power amps, get?) It somewhat embarrasses me, but to date I have not been able to find anything to criticize in the sound of this preamp.

Interestingly, while the SP-11 passes a bypass test so well it is impossible (for me) to tell which I'm listening to, it does not have any of the coolness or subtle dryness I have observed in other preamps that I have characterized as "mercilessly accurate." The SP-11 is both accurate and "musical," if you can imagine such a combination.

There are two bits of bad news, though. One is its formidable price. I have looked inside the SP-11, and I am damned if I can see why it should have to sell for as much as it does. $3000, yes; $3999, maybe. But $4900? Unfortunately, ARC is never going to sell enough SP-11s at that price to justify producing the LSIHs! that might effect a dramatic reduction in their production cost and thus their price. Nonetheless, I must admit that the SP-11 is enough better than any other preamp I know of—or have even heard of—to justify its purchase by anyone who can afford it.

The other bit of bad news is that, after about 12 hours of warmup, the damned thing sounds even better! Noticeably. Every time I listen to it, after it's really charged up, I get two consecutive gut reactions. First, my jaw hangs slack. Second, I get chills and goose bumps. Sometimes I stand up and wave my arms in time with the music and shout the way some well-known conductors are known to do. In a word, I get involved.

The reason this is bad news is that I cannot recommend leaving the SP-11 turned on all the time, as ARC implies (but does not come right out and recommend), because estimated tube life under constant-on con-

---

1 Large-Scale Integrated Hybrid.

2 Interestingly, sales of the SP-11 have been brisk since it was first introduced, making it one of ARC's best-moving products. I figure just under $1M sales for the first year, to the factory (the factory tells me it's just under $2M). The measure of the U.S.'s (and the world's) willingness to really shell out for the best has yet to be taken.

---

The Audio Research SP-11 is an incredible preamplifier, very probably the best preamp that any amount of money can buy today. If it does not sound as musical as some loudspeakers currently in my house than some other preamps I have, I am willing to blame that on the loudspeakers and look for other ones. And I don't usually make that kind of excuse for any product. This calibre of sound quality is what high-end audio is all about!

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The Myth and Reality of the British Pressing (Part I)

The maxim that the grass looks always greener on the other side is as true in audiophile record collecting as in any other endeavor. Serious audiophiles will pay a hefty premium and go to ridiculous lengths to obtain imported pressings of recordings readily available on domestic labels. British pressings have always been a favorite of devout collectors, and one friend of mine supports himself nicely by importing U.K. releases of popular recordings on a special-order basis.

Ironically, many of these recordings aren't pressed or even mastered in Britain. Most British releases on WEA labels are pressed in West Germany and many Polygram LPs are pressed in The Netherlands or the DFR. Even more ironic, many British audiophiles actively seek U.S. pressings because—you guessed it—they believe the U.S. pressings sound better than the domestic releases.

My experience with British pressings has yielded mixed results. Quite often the tish pressing was clearly superior to the U.S. version; just as frequently, the U.S. release was preferable. Sometimes there was no significant difference. Mostly to satisfy my own curiosity, I undertook to subjectively compare and evaluate the British and American versions of ten LPs of above-average sound quality. I was assisted by a number of friends selected for the quality of their ears—and their ability to supply missing versions of some recordings (for which I thank them).

Some clear patterns developed during the course of the listening. Although hardly conclusive, I have a much better understanding of when to cough up the extra bucks for the British pressing. This first review will compare five recordings, the second (in Vol. 9, No. 5) will include the other five and my conclusions.

Phil Collins
Face Value
Atlantic SD 12069 (U.S.), Virgin 2185 (U.K.)

There wasn't a great deal of difference between the domestic and U.K. versions: the British copy had slightly more background surface noise, but the U.S. release made up for this with an occasional moderate attack of "Rice Crispies." The reverb on Collins' voice was a little excessive on the U.S. release, and there seemed to be too much upper midrange energy on most cuts. "Behind the Lines" sealed the victory for the U.K.—the treble on this cut sizzles on both versions, but is at least listenable on the Virgin pressing. The U.S. release had a little tighter midbass and slightly more bass impact on "In the Air Tonight," but this was too little too late; the British pressing wins in a split decision.

Peter Gabriel
Security
Geffen GHS 2011 (U.S.), Charisma PG4 (U.K.)

Another close contest, but here the nod goes to the American pressing on the strength of better dynamics and cleaner sound, particularly on the second side. There were no great differences between the two pressings—tonal balance, performance at the frequency extremes, and detail varied no more than I've encountered in two different copies of many U.S. pressings.
But the Geffen had more life-like dynamics and less surface noise. These advantages were particularly noticeable on "Shock the Monkey" and "Lay Your Hands on Me."

**Pink Floyd**  
*The Final Cut*  
Columbia QC 38243 (U.S.), EMI Harvest shpf1883 (U.K.)

No contest here. I suspect the difference would be obvious on a small table radio. The British EMI pressing is outstanding. The Columbia EMI pressing provides at least a partial explanation of why record sales are down—it's pushing it to call the U.S. pressing hi-fi. The EMI offers more detail, better dynamics, tighter and deeper bass, more extended highs, and the holographic image for which the Floyd is famous. In comparison, the American pressing sounds flat, mushy, and distant.

**Sade**  
*Diamond Life*  
Epic BFR 39581 (U.S.), Epic EPC 26044 (U.K.)

Closer this time, but not close enough to leave any doubt that the British pressing was superior in almost every respect. Both versions were quiet, with about the same level of detail, but the U.S. pressing was bright and thin, with noticeable upper midrange/lower treble prominence. The British pressing again had superior bass and HF extension. Both pressings had a somewhat jumbled front-to-back soundstage, with instruments, or parts of instruments, frequently sounding as if they were in front of the vocalist. For example, most of the drum set was securely placed in the back of the soundstage, but occasionally selected parts would jump right out and begin tapping away several feet in front of Sade. This was disturbing enough on the British pressing; it was so exaggerated on the American version that it made you want to put your hands over your face to protect your nose.

**Yaz (or Yazoo)**  
*Upstairs at Eric's*  
Sire 9 23737-1 (U.S.), Mute STUMM 7 (U.K.)

This is a first-rate recording, and both British and American pressings do it justice. The American pressing has quieter surfaces, but both have good detail, soundstage, and frequency extension. The tonal balance differed dramatically between the two pressings, the British pressing being warmer, almost to the point of being heavy, while the U.S. version had considerably more HF energy, particularly in the lower treble. Since this is synthrock, it's impossible to say which version is right, but the American pressing was preferred by all.  
*To be continued.*

At half-time it looks like the Yanks are in some trouble, with the score 3 to 2 in favor of the Limeys. Both American victories were squeakers, whereas the British walked away with two of their three wins. Next time we'll see if the U.S. can come back.—**SWW**

**A Guide For The Serious Collector**  
*The Complete Penguin Stereo Record and Cassette Guide*  
Edward Greenfield, Robert Layton, and Iwan March  

This book contains 1387 pages of record reviews. If your cup of tea is classical music, I can think of no better resource. As in any other type of criticism, you won't always agree with the opinions, but the authors' criteria are consistent; if you disagree with them, you'll be able to read around their biases. For me, in most cases, they are right on. They may have an automatic love for Perlman and Janet Baker, and spend an inordinate amount of space on Medieval and Renaissance music, and deal with many records available only in England, but they've put a lot of effort into reviewing records available in the U.S., and always give a catalog number for U.S. releases if extant.

The book is organized by composer, then by work, which makes it possible to get comparative reviews. If, for instance, you wanted a luxuriously slow performance of the last movement of Mahler's Third Symphony, simply look it up: the authors give comparisons of such interpretive details. In addition, each work's performances are listed in the authors' order of preference.
While the reviews don't dwell on sonics as the single overriding issue, great sound will be noted, and poor sound will receive an understated—and typically British—adjective such as "rather harsh" or "slightly steely." But it is in their brief descriptions of interpretive differences that the authors truly shine. Also, they review each format a recording is available in: record, CD, and cassette.

All in all, an indispensable book for the serious collector.

—WM

The Most Exciting Label Debut in Memory:
Private Music Numbers 1101, 1201, 1301, & 1401

Sanford Ponder
Etosha—Private Music in the Land of Dry Water

Patrick O'Hearn
Ancient Dreams

Jerry Goodman
On the Future of Aviation

Ryuchi Sakamoto, Eric Watson, Joachim Kuhn, Eddie Johnson
Piano One

The four works in Private Music's initial release represent such a consistently high level of creation that it is remarkable to see them released all at once. The label's owner, Peter Bauman, was one of the founders of Tangerine Dream, the pioneering electronic music group from Germany. His influence infuses all of the releases.

*Etosha* is a Fairlight CMI tour-de-force. Ponder has spent many years in NYC studios doing session work for soul singers, rappers, soundtracks, and anything else that came along. The recording has occasional nature sounds which Ponder alters through his CMI. The music resembles a combination of Windham Hill, Vangelis and Ralph Lundsten's Nordic Nature Symphonies. Both silver and black discs enjoy exceptional sound, but watch out for the first track, "Watergarden"; it's a real woofer-buster.
This is one of the few CDs for which I push the repeat button, letting it track over and over. A necessity for anyone fond of mellow electronic music.

Asuch as I love Ponder's work, O'Hearn's is even better. He has been the keyboardist for Missing Persons, Frank Zappa,1 and Group 87. Structurally, they are similar to Robert Fripp's Frippertronics in that they build slowly but inexorably toward memorable conclusions. Tonally, O'Hearn puts out round, full, deep sounds with an incredible sense of melody. Sonically, there are transients here to test the best. One sound in the first cut sounds like a steel bar dropped on piano strings and I to bounce there for several seconds. This was more than a friend's Grado could handle. Again, as with Ponder, there is bass that is very deep, yet a delicacy to the high frequencies that might convert anti-digitalis. To put it mildly, Ancient Dreams is very highly recommended.

Jerry Goodman was guitarist and violinist with the late-sixties group The Flock. He then joined Mahavishnu John McLaughlin to form the Mahavishnu Orchestra. His record is the most conventional of the four, and my least favorite, yet presents so many interesting contrasts between electric and acoustic violin that it is still recommended.

_Piano One_ (I hope this means there will be more) is the mellowest of these Private Music releases. It features four different piano players, each with their own special style. Sakamoto is very well known in Japan as the leader of the Yellow Magic Orchestra; he costarred in, and wrote and performed the soundtrack for, the movie _Merry Christmas, Mr. Lawrence_. His two cuts on this record are standout tracks from his Japanese release _Coda_, a record you should move heaven and earth to find. Eddie Johnson has been in Roxy Music, King Crimson, Jethro Tull, U.K., and Curved Air. You will be quite surprised to hear his gentleness here. Joachim Kuhn, a famous European jazz pianist, makes music with more wit and style than the others, yet manages to maintain the mellow mood. Eric Watson is new to me, but his one contribution is one of the best things on the record.

All four recordings are available on CD, record, and tape; I would get the CDs, although the sound quality of both CD and LP is superb (I didn't hear the tapes). Extension at both frequency extremes is excellent, and, in the middle range, you will occasionally experience what JGH refers to as aliveness. The acoustic spaces have been manipulated so that the imaging becomes one of the most enjoyable parts of the experience. If you have trouble finding these recordings, call 212-684-2533 for direct sales.

WM

**Liszt**

_Sonata in B Minor, Après une Lecture du Dante_

_Sonetti de Petrarca, Nos. 47, 104, 123_

John Browning, piano
Delos D/CD 3022

This is a fine recital, but John Browning's Liszt will not be to everyone's taste. He avoids overdramatizing the music—no virtuosity for its own sake. These are thoughtful, very carefully considered performances, with some truly exquisite phrasing, which I think will bear up well on repeated hearing. I particularly like the three _Sonetti de Petrarca_, which Liszt originally wrote as songs for high tenor voice. Browning captures the lyricism of these pieces in a way that seems just right.

For excitement as well as technical dazzle, listen to Browning play _Après une lecture de Dante, fantasia quasi sonata_. Here, Liszt would have the piano sound like an entire orchestra; it almost does. Only Liszt and Prokofiev were able to write for the piano this way, so far as I know.

Obviously, I recommend this disc, but with a caveat about the sound quality. The piano could have had more immediacy, and there are a few times when the sound seems congested—almost like bunching up of sound you get with a mediocre phono cartridge. On the very best piano CDs (and with good speakers, like Quad ESL-63s), you could swear the piano was in your listening room, the way you never could with an LP. Not here. Delos should try to do a better job next time they record.

1 Actually, O'Hearn was a bassist with Zappa. —Copy Editor RI.
Browning, which I hope they will (Prokofiev's "Romeo and Juliet," perhaps?). As with all new Delos recordings, this release is CD only (and 71 minutes long!). Ivor Tiefenbrun can go take a walk. —TG

Beethoven
Concerto No. 3 for Piano and Orchestra in C Minor, Op. 37
Concerto No. 4 for Piano and Orchestra in G Major, Op. 58
Murray Perahia, piano; Concertgebouw Orchestra, Bernard Haitink, conducting.
CBS MK 39814
Twice I tried to review this disc; twice I fell asleep. Bernard Haitink can do that to you—highly competent, but dull. Unfortunately, the same applies to Murray Perahia, at least in this instance. Yes, he plays beautifully. Yes, his technique is flawless. Yes, if I heard this live at a concert I would be satisfied. But to have these performances on CD, to listen to again and again? Uh-uh. There is just nothing exceptional about them. There's not enough drama—Haitink sees to that. Lacking, too, is the poetry that Claudio Arrau or the late Emil Gilels bring to this music. To make matters worse, the sound borders on the atrocious: the piano seems muffled, the orchestra distant, thin, and somewhat shrill. A most unsatisfying release. Wait for the Gilels/Szell recordings to show up on CD; they have already been reissued on digitally remastered LPs. —TG

Mozart
Symphonies No. 35 (Hafner) and 38 (Prague)
Bamberg Symphony, Eugen Jochum conducting.
Eurodisc CD 610277-231
Mozart conceived his Hafner Symphony as a sort of second Hafner Serenade. The symphony has much the same light, cheerful, almost carefree character: there's nothing heavy here. And the performance is in the best possible hands: Eugen Jochum, one of the last of the old generation of European conductors (which included Karl Bohm, Josef Krips, and Otto Klemperer). Experience shows. If the orchestra is not quite on a level with the Berlin Philharmonic, the conducting is superb. Tempos are well

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Stereophile 137
Once upon a time
the enjoyment of music in the home
was limited to the privileged few.
judged. The performance has life, air, and an almost chamber-like quality, even though this is full-orchestra Mozart.

The Prague Symphony, too, receives as good a performance as I've heard. Andante, with its G major theme introduced by the violins and then transferred to the woodwinds, is particularly lovely. Again, the textures are chamber-like in their transparency.

The recording is quite good, but with just a trace of hardness in the upper registers. Nice depth, good balance—the performances were not recorded up too close, nor do the engineers zoom in on particular instruments. Highly recommended; I hope there are more to come.

—TG

Mahler
Symphony No. 5
Philharmonic Orchestra, Giuseppe Sinopoli conducting.
DG CD 415 476-2
How nice to have Mahler's Fifth Symphony—all 68 minutes—on a single compact disc. This is value! With LPs, the work is usually spread out over three sides, meaning two round trips to the turntable in mid-performance. As Sam Tellig has commented, this is one of the great advantages of CDs—you don't have to turn over the damned record! As for the performance, this will not replace the great Sir John Barbirolli performance on EMI/Angel as my first choice (let's hope that one makes its way onto CD), but is nevertheless a very fine version. It would be my first choice on CD at the moment (over Levine on RCA). The performance is lean, energetic, not overwrought, which is all to the good—with the Fifth Symphony, Mahler moves toward a tighter, more closely knit symphonic style. The Adagietto—a "song without words"—is particularly fine, and eloquently played.

The silent CDs ensure that nothing destroys the mood. The recording is one of the best I have heard from DGG—their tonmeisters did not run amok with multi-mikes. There's good depth, and imaging is natural. The dynamic range, however, seems rather compressed. Still, a very worthwhile addition to a crowded Mahler catalog.

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Pacific Coast Laboratories Responds to JGH's "Miscellany" Note

J. Gordon Holt:

Your note "Trademark Ripoff" (Vol. 9, No. 2, p.124) demands a rebuttal! If you "urge Nakamichi, in the name of common decency, to find another name for their line of premium pre-recorded cassettes," why, "in the name of common decency," did you not contact us to check your facts before printing a damaging and erroneous article?

If you had, you would have found that Nakamichi initiated its Reference Recording Series in 1984, at which time the company, Reference Recordings, had not even trademarked its name! At that time, our trademark search on the name "Reference Recordings" and "Reference Recording Series" had turned up negative.

It is a matter of public record—which, as responsible journalists, you should have unearthed yourselves—that Reference Recordings did not file for a federal trademark application on the name until May 28, 1985, well after Nakamichi Reference Recording Series was introduced.

Had you contacted Nakamichi before dipping your pen in the venom of self-righteous indignation, you would have learned that, as "honest gentlemen," we decided to designate future products as the "Sound of Nakamichi Reference Cassette" series to avoid possible confusion with the Reference Recordings company without being forced to do so, and well before your poison-pen letter appeared.

So now, we ask you, "make honest gentlemen" of yourselves and publish this letter in its entirety. Your readers (as well as Nakamichi) deserve an explanation of such shoddy journalism.

Mike Strange
Sales & Marketing Manager
Pacific Cassette Laboratories
Torrance, California

Reference Recordings® Replies:

Thank you for the phone call with the latest information on "L'Affaire Nakamichi." Here is a brief clarification of our position.

Reference Recordings Ltd. did not have a registered trademark until after the problem with Nakamichi arose, therefore the facts as stated in the Pacific Coast Laboratories letter dated April 29, 1986 are correct. However, as a point of law, a trademark exists whether it is registered or not if it is used on an exclusive basis for a significant period of time by a company engaged in national commerce.

We have been using the name "Reference Recordings" in commerce since 1984, and our Registered Trademark Certificate reflects that fact. We are well known in audio circles, and find it hard to believe that Nakamichi was unaware of our use of the name "Reference Recordings." Before their line of premium-quality cassettes was introduced, in fact, we were approached by a representative of Nakamichi inquiring about the possibility of Nakamichi licensing recorded material from us.

We have had correspondence with Nakamichi going back to April, 1984 on this question of trademark infringement, escalating into repeated legal demands for Nakamichi to change the name of their cassette series. We are pleased and relieved that Nakamichi do plan to change the name of their cassette series; this should end the present confusion.

We at Reference Recordings® appreciate the support given us by the audio community in this matter, in particular the media coverage. Grassroots pressure can be as effective as legal action!

Tam Henderson
Reference Recordings®
San Francisco, CA
Stereophile apologizes for not checking with Pacific Cassette Laboratories prior to publishing JGH's critical note. There are almost always two sides to any dispute.

Nevertheless, we tend to side with RR®. As Tam Henderson states, it is very hard to believe that PCL or Nakamichi could have been unaware of Reference Recordings®' use of their own name, especially since they approached Reference Recordings® about the use of material (we wonder how they got the phone number and address without knowing the name). Reference Recordings® received their trademark on December 24, 1985. Though PCL has advertised since then using the name "Nakamichi Reference Recording" (see Stereophile, Vol. 8, No. 8, p. 125), this advertising was placed before the granting of trademark and is therefore technically defensible. We grudgingly commend PCL for reluctantly changing the name of their cassette series.

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Fosgate Research

Editor:

We at Fosgate appreciate the efforts of Stereophile to bring its readers up-to-date regarding the latest generation of surround processors. We have witnessed, especially over the last year and a half, a marked renewal of interest in surround sound. We feel vindicated in our long-term support of surround technology through thick and thin.

The 3601 which Bill evaluated was a very early unit. The 3601 supplied to Gordon is representative of current production. Current units have much improved spaciousness, with a more cohesive and uniform soundfield. Changes of certain components used in various audio signal paths have reduced sonic coloration. As Gordon noted in his footnote, “The latest version of the 3601 has virtually none of these problems, and has tighter and more punchy bass too.” We believe that because of the overall sonic improvement brought about by these changes, the 3601, in fact, is not surpassed by any competitive surround processor. A factory modification is available for $35 to update any earlier 3601 to current production standards.

There are some differences in sound character on the surround channels when comparing the 3601, in the Dolby mode, to the Shure HTS 5000, probably because of differences in the filter circuits used to create the 7 kHz roll-off. We subjectively judge the slope of the frequency response curve on the Shure to drop more rapidly than the 3601 above 7 kHz. Subjectively, on A-B comparison the Shure appears to have a slight bump in the curve before roll-off begins.

The 3601 has several different operating modes. Bill indicated to us that he did not fairly audition the Panorama mode. This was unfortunate because most owners of the 3601 prefer this mode for the same reasons Bill prefers his Minim AD10. In fact, when decoding surround-encoded program material the results are very similar to those which Bill described for the AD10, with the added advantage of better than 35 dB front-to-back separation.

The Panorama mode provides a spatially correct 360° panoramic expansion of Dolby Stereo and normal stereo. The Panorama mode provides separation across the back channels to enable spatial information to be localized into the back corners and along the sidewalls. Sounds at extreme right and left of the stereo soundstage will image at respective center-wall positions assuming speakers are properly positioned and reasonably well matched between front and rear. Intermediate positions will be localized around the front half of the room. Out-of-phase information will be panned around the back channels with the surround channel positioned in center back. This is in marked contrast to any of the other tested competitive units, which do not have similar operating modes.

In the Panorama mode, MP Matrix surround effects are reproduced with correct localization and with the expansion of the side stereo stage. The net result is a soundfield that is a more hemispherical soundfield. The 7 kHz filter and time delay are bypassed in this mode, providing full range frequency response on all channels.

We must also point out that Center Channel output on the 3601 is not “frequency weighted.” With a three-channel front system, there will be little, if any, difference in bass performance with or without the Center Channel engaged. Separation is reduced across the front channels at bass frequencies. In other words, low bass is not removed from the side speakers.

We emphatically disagree with Bill in his assessment and recommendation discouraging readers from adding a Center Channel. There are valid reasons for use of a Center Channel in theater applications, and these reasons are equally valid in the ma-

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writing earlier to express my pleasure with the review and Stereophile in general.

The excuses are as follows: I got married, went to Europe for business and honeymoon, and attended the PARA Conference. I've been out of the office more than in it. It wasn't until I sat down to go through the mail and saw the latest issue sitting forthrightly on my desk that I remembered. I slapped my forehead in dismay, cursing gods for not installing word-processing equipment into an already wonderful machine (the human body). I clutched my pen madly and had my secretary type this letter to you.

Thank you for the review. It summed up quite accurately how I feel about the B215. It really makes incredible recordings. Try A/B between disk and tape. Unbelievable!

The book looks great. Congrats!

Lawrence G. Jaffe
Nashville, TN

VMPS Audio Products
Editor:
There is little to add to AHC's detailed and accurate description of the VMPS Super Tower IIa/R speaker system. I should note that the flexibility designed into the speaker is deliberate: 50 dB of control over mid, treble, and supertreble; bi-amp capability without an external crossover; and (most importantly) adjustable bass damping. It has been pointed out that so much adjustment range permits the user to ruin the sound totally; I agree. It is equally true that without such adjustments, the audiophile is stuck with whatever constraints his listening room and ancillary equipment impose. All speakers are "amplifier-sensitive"; they are also speaker-wire-sensitive, flexible-wooden-floor-sensitive, room-volume-sensitive, etc. Users should take advantage of the STIIa/R's flexibility to optimize the system for where and through what they listen. Owners whose taste runs to "lean and clean" can lower system Q to about 0.5; the "boom and thud" brigade can revel in warmth in the 2.0 total Q range. The factory setting of approximately 0.7 presupposes nonflexible floors, Tiptoe-mounting, and low source impedance (high damping fac-
tor solid-state amp). Owners of tube gear would add mass, as would occupants of rooms with wooden floors, very large rooms, or those who don't use Tiptoes.

The STIIa/R is available in kit form with assembled cabinets in black ($1099 each), oak or walnut ($1299 each), or without cabinets ($859 each, plans supplied).

My main problem with AHC's report is ego bloat and hat-size enlargement (colleagues have told me that neither was needed). Oh, well.

Brian Cheney, President
El Sobrante, California

Music & Sound Imports
Editor:

We would like to thank Don Scott for his straightforward and thorough review of the Creek 3040 FM tuner, with which we are in full agreement. The 3040 has now been replaced with the 3140, which has a redesigned RF front-end using a special bipolar IC that provides novel capabilities aimed particularly at those who live in difficult reception areas.

The new tuner has different front panel controls, providing switchable narrow-band IF filters and Local/DX selection. This function does not affect the sensitivity, but only shifts the thresholds of the muting circuits and the on-tune indicator, to prevent reception of marginal signals.

Also new is the indication of relative signal strength by changing brightness of the Frequency Display.

With this latest tuner, Creek maintains their position as a manufacturer of British hi-fi who achieves sound quality as good or better than equipment costing several times the price.

Stu Wein
Huntington Valley, PA

Win Laboratories, Inc.
Editor:

Thank you for the review of the Win Laboratories' Win Jewel moving coil cartridge and matching preamplifier.

Our moving coil and preamplifier are not new technologies, but merely an extension of what is currently on the market. The dif-

PERFORMANCE

When discussing specific performance, we at Electron Kinetics avoid reference to cost because it is not relevant to the topic.

With this understanding I invite your direct comparison of my system, the Eagle 2A driven by our new Eagle 2000 preamp, with any assemblage of other ultra-high quality components offered by any individual or manufacturer—world over. My best vs. another best. Performance vs. performance.

John Iverson

Dealer inquiries encouraged.

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ference is that they are developed with proper limitations and constraints within the scientific discipline.

While most of us in the field of audio think that creativity is at its best when it is free to roam without having to follow any set of rules, precisely the opposite is true. The constraints, limitations, and criteria for the best sound a moving coil and preamplifier can produce are studied in advance; they are achieved not by running willy-nilly to explore a myriad opportunities and ideas, but by solving problems that others have ignored or forgotten.

Form is the precursor of function; the same holds true in the development and design of the Win MC and its preamplifier. Had there been no set of rules and no preconceived expectations (which, in fact, the products generally exceeded), the excellence of the Win Jewel Moving Coil and its preamplifier would be unrecognizable from other moving coils and preamplifiers on the market. But, as Dick Olsher plainly states, it is "the finest-sounding phono system I have heard."

Sao Saw Win, President
Goleta, California

Kindel Audio
Editor:

Thanks for sending me an advance copy of JGH's review of the Kindel P-200 Mk II. We are delighted that Mr. Holt has taken the time to evaluate one of our products.

There are a few points raised in the review which call for an answer. First, with regard to the foam blanket used to cover the front baffle of the P-200 Mk II: the review answers one of your questions. The drivers are firmly screwed down, fully compressing the foam. This provides an airtight gasket, and ease of service in case the drivers should have to be removed. The "resilience" spoken of in the brochure refers to the suppression of vibrations on and in the front baffle. The foam blanket damps the front baffle in much the same way as the bituminous felt used inside many English speakers. In addition, the foam blanket suppresses airborne waves, and is mated to a ring of foam lining the inside edge of the grill. This results in a reduction of frequency- and time-related colorations. So the foam blanket serves three purposes: airtight gasketing of the drivers, suppression of vibrations in the front baffle, and the suppression of secondary reflections from the baffle and grill.

I am surprised that you were able to get the woofers to bottom. They are designed to be very difficult to bottom: i.e., the suspension is fully extended (stretched) before contact with any metal. In the event that a woofer does bottom, it is designed so that the spider will rub on the magnet structure's front plate while there is still \( \frac{3}{4} \) " clearance between the fragile voice coil and the back plate, so the woofer's bottoming, should it occur, is indeed nondestructive. This is confirmed by JGH's experience with the Telarc bass drum.

Kindel Audio has never been comfortable with the speaker power ratings used by most companies. These ratings try to reduce a complex figure into a single number in watts; the idea that speakers can be rated in watts leads to no end of confu-

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sion for consumers. Kindel does issue watts ratings on its speakers (see Audio's Annual Equipment Directory, for example) but it is not a concept that we are comfortable with. At any rate, the reliability of the P-200 Mk II is extraordinary, with well under 1% ever having required service.

Mr. Holt's comments about associated electronics are appreciated. Your "typical Japanese receiver" will not sound good with any accurate speaker such as the P-200 Mk II. However, the "superb associated electronics" required for best performance need not be horribly expensive. Kindel dealers assemble very good-sounding systems around the P-200 Mk II using electronics such as Creek, Rotel, NAD, PS Audio, and the like.

William Kindel
Riverside, California

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antenna was designed to provide a convenient way of receiving a usable FM signal in a wide range of urban and suburban locations.

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Your review noted that our antenna provides about 40% more signal than the antenna usually supplied with tuners, and from 25% to 30% more signal than a standard or folded dipole. It should be noted that a 3% to 5% increase in signal level can be enough to cross the threshold from a usable to a nonusable signal; a 30% or 40% increase can provide satisfactory signal for a substantial number of stations that would otherwise be unlistenable.

The Parsec 7403-II is not, nor was it designed to be, a fringe area antenna. It was designed to function as an omnidirectional antenna, to accommodate the broadest variation in signal levels, avoid intermodulation distortion, and reject adjacent bands, all of which it accomplishes very well.

As for the antenna length, we have found that your reviewer is correct: greater length improves the gain at higher frequencies, but it also reduces the antenna's ability to prevent overload in a strong signal area.

We believe that our compromises, which are inevitable in the design of a product of this nature, were chosen wisely. We will be introducing some special-purpose antenna models this year which will indeed incorporate some of your suggestions. We will be pleased to send samples for review as soon as they become available.

Scott Sherman, National Sales Manager
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tunity to comment on Sam Tellig’s article, “The Audio Cheapskate Meets the Dual CS5000 and the Thorens TD 318 Turntables.”

Although it is not noted in the TD 318’s owner’s manual, and is not an “officially sanctioned” adjustment, the height of the tonearm pillar can be adjusted by loosening two setscrews in the tonearm pillar collar. (The tonearm pillar collar is located at the base of the tonearm pillar under a plastic cover ring.) The only tool needed is a 2-mm Allen wrench. The arm can be lowered approximately 4 mm and raised approximately 6 mm from its nominal height. Because the auto-shutoff trigger circuitry is attached to the bottom of the tonearm pillar, the tonearm height can be changed without having to readjust any other parts.

Making this adjustment will in most cases necessitate adjusting the height of the tonearm lift bar. This is a relatively minor problem, requiring only the 2-mm Allen wrench referred to above. A little trial and error will determine the proper height for the lift bar.

There is one reason to avoid making this adjustment: once the pillar height is changed the cartridge alignment procedure described in the manual, and the cartridge alignment template supplied, can no longer be used because the tonearm pillar will not be at the factory-standard height. The owner will have to rely on other cartridge installation methods. Unless one is set on establishing the strongest possible coupling between tonearm and cartridge, it may be best to leave the pillar height at factory standard settings and use spacers to set VTA. Even using the tonearm pillar adjustment for VTA, its range of adjustment may still require some spacers, though their thickness can be greatly reduced.

Sam noted that whoever installs the cartridge must attach the cartridge connection wires to pins on both the tonearm and the cartridge. While this is true, how much of a “pain” is it? Once a pair of needle-nose pliers is in hand, attaching the wires in eight places instead of four is something that takes only one or two minutes extra.

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they patronize are likely to be meticulous about every detail of cartridge installations; given the amount of time they will already be spending to install any cartridge in any tonearm, the difference of one or two minutes is of little concern.

Although I would have preferred that Sam had expressed a preference for the TD 318 instead of the Dual—a slight preference though it was—I must accept the comments as his honest and educated opinion. I do, however, encourage *Stereophile* readers to consider the strong points of the TD 318 that Sam noted: its robust construction and the longevity that will result from it (we give Thorens products a five-year "limited" parts and labor warranty); its excellent tonal balance; and its isolation and stability. Then make your choice based on your own priorities and long term requirements.

**Frank Hildebrand**
Newburyport, MA

**Audiophile Systems Ltd.**

Editor:

We find it interesting that Tony Cordesman deems it desirable to open his review of the Improved SOTA Star Sapphire, VPI HW-16, and Delphi Oracle Mark II turntables with a shot at Linn Products, particularly given his subsequent dismissal of the Linn Sondek as a second-rate turntable. Mr. Cordesman states, "The fact that Linn Sondek's advertising has made a British cult out of buying a comparatively high-priced Linn turntable—even for comparatively low grade components—has no justification other than profits for Linn." We are certain that Mr. Cordesman is sincere in this opinion, and probably did not intend this statement as a cheap shot. Nevertheless, it is sadly misinformed, and deserves correction.

First, the company is Linn Products, not Linn Sondek. They are best known for their turntable, the Linn Sondek LP12, but they manufacture a range of products: five cartridges, three tonearms, a preamp, a power amp, five models of loudspeakers, and soon an electronic crossover and a new turntable (the Linn Axis). Given this broad product range, Linn's investment has been to try to see to it that customers actually get systems

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that make sense, not necessarily that they buy a turntable. This has been largely accomplished not by advertising, but by Linn dealer's proving the point to their customers with demonstrations and comparisons.

We here at Audiophile Systems do not feel we are in a position to analyze the idiosyncrasies of the British hi-fi market. (We wonder that Mr. Cordesman, who is certainly less connected to it than we, feels that he is.) In the U.S., as most readers of this letter will already know, we've done very little advertising, and the great majority of what we have done has been devoted to our speakers, amplifiers, and tonearms. On the other hand, most U.S. Linn dealers will be happy to demonstrate the difference that turntables make in any system, or do an analog/CD comparison.

As far as we are concerned—and we have made this point again and again over the years—the only thing that ultimately matters is that the customer hear the difference for himself, and make his own decisions. We certainly cannot be counted on to give an unbiased opinion. As to reviewers, we doubt that there are very many of them who are free of preconceptions about the gear they review; we have encountered more than one over the years with a personal axe to grind. That is why we long ago quit reprinting and distributing favorable reviews of our products. It all seemed rather arbitrary to us, and in any event, it isn't the reviewer who has to live with, or pay for, the product the customer buys. Since the customer does, it's very important that he listen to the equipment in a properly set-up system, and make his own judgments about its merits.

Certainly, Linn maintains that turntables make an important difference in the performance of a system. Indeed, Mr. Cordesman's review would be pointless if this were not the case. When Linn began forcefully promoting this point to a skeptical industry over a decade ago, it was widely assumed that turntables with like measurements would sound largely the same, and contribute very little to the character of the system. In those days, the semi-annual Linn turntable A-Bs at the Consumer Electronics

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Shows were quite an event, and opened a lot of eyes and ears. They proved that a good turntable will yield benefits that can be heard in almost any system.

Whether this is always enough of an improvement to justify the cost of the turntable, or the most cost-effective way to improve a particular system, is a totally different question. Certainly, any top-notch system requires an impeccable source if it is to perform to its potential. In many mid-level systems, improving the turntable is often the most effective way to gain an overall improvement, depending on how good the rest of the system really is. In cheaper systems, the justification for owning an excellent turntable is that it will certainly result in some improvement in performance. It also provides a solid foundation, which will not need to be changed, upon which to subsequently improve the rest of the system.

We agree with Mr. Cordesman that "no one need sneer at cheap analog record players." There are many legitimate analog turntables that can be employed optimally in a range of systems. On the other hand, using a cheap record player as the source for an uncompromising amplifier and speakers will only result in a sound that is disappointing, no fun, and worth sneering at. For years now, we have been trying to educate consumers who have been advised by prominent reviewers to put "50% of their budget in the loudspeakers" to avoid this pitfall. We sell loudspeakers, but we want to sell them in systems that sound good.

We understandably do not like to be portrayed as con artists, which is the inescapable implication of Mr. Cordesman's statement. We have worked too long and hard trying to deliver something of legitimate value to the consumer, both in terms of a product and a service, to overlook this sort of comment. Indeed, it seems unlikely that the Linn Sondek turntable could have been in continuous production for 15 years—and we just had our record month (April) for both overall sales and unit sales of turntables—without having offered something of legitimate value, and without our being able to prove it. We've seen a lot of people get conned. We've stayed around, and grown stronger, by putting our money where our mouth is. We've taken the time to demonstrate the differences we claim, to the satisfaction of the customers who have to live with the product.

As to Mr. Cordesman's perfunctory assessment of the Linn as not belonging in the same category as the decks he is reviewing, we can only say that we disagree (no surprise, eh?). We have done comparisons of the Linn with all of the turntables he reviewed, and found the Linn significantly more enjoyable to listen to than any of them. Perhaps we are prejudiced. Perhaps Mr. Cordesman is. Perhaps we just listen differently. On this score, we note that Mr. Cordesman observes, with respect to pitch accuracy, that "Fortunately, most people recognize (this) by lack of long-term listening fatigue." While we agree entirely with this point—indeed, long-term listening fatigue is the way people find out about most faults in their hi-fi—we find this most unfortunate. It results in a lot of serious music lovers repeatedly shelling out a great deal of money for hi-fi systems that they really don't listen to after about three weeks. This makes for a lot of repeat business for dealers, and a large market for review magazines, but it's awfully hard on the customer. In the end, we think it isn't very good for the industry.

Accordingly, we've spent the last few years trying to promote a system of evaluating hi-fi equipment that's intended to let people know quickly how well they'll live with the system over a long period. This has become popularly known as "singing along with the tune," and, while it has nothing to do with perfect pitch, it does rely on attending to both the pitch and the rhythmic relationships in music. Most people can do this, and it goes a long way toward telling whether a system is acceptable or not to them. It also has the effect of demystifying hi-fi, and eliminating most of the obscure jargon of the cult. This has not endeared us either to reviewers or other manufacturers, who largely depend on this mystique and its impenetrable jargon to support their expertise. In other words, we're not the only ones with an investment here.
Readers may wonder that Mr. Cordesman’s short references to Linn Products should provoke such a lengthy and strongly-stated reply. However, Mr. Cordesman’s casual assertion that we are simply profiteering in promoting what we think to be a sensible approach to building a hi-fi is certainly a serious charge. We sincerely have no idea of his motives, but we find it irritating that Mr. Cordesman, who seems to understand very little about what we are doing, should so glibly state this position. We full well intend to make a profit, but we’ve tried to do it by offering a legitimate product, a legitimate service, and talking a lot less nonsense than usually goes around in this industry. It is quite one thing if Mr. Cordesman disagrees with our approach, or simply doesn’t think we know what we are doing. That’s his right—the feeling is obviously mutual. It’s quite another for him to question our ethics, or dismiss the legitimacy of our enterprise.

Anthony M. Gregory, General Manager
Indianapolis, IN

That’s what we like, spirited replies. A copy of Audiophile Systems’ comment has been forwarded to AHC, but not in time for a reply to appear here. Knowing AHC, I doubt that he’ll feel compelled, but I may be surprised.

—LA

Pentagram, Inc.
Editor:
There is a tendency in this industry to go for the mystical, rather than the scientific (q.v., “Stop Digital Madness,” Vol. 8, No. 8); whatever we want to believe we can find proof for. Your magazine has been one of the few that, while open to new ideas, has consistently sought to verify them through scientific method.

It was for this reason that I was so perplexed by your review of the Pentagram P-10s (Vol. 7, No. 6); in many ways it did not correlate with our own experiences. Since I have never found reason to question your reviewers’ objectivity or the quality of the reviews, I investigated what could have gone wrong.
I discovered some pertinent facts, but not until months after publication of the review. Some of SWW’s observations were totally incongruent with our knowledge of the P-10:

1. Horizontal smearing of the image.
2. Massed strings and male alto choral voices sound somewhat slurred together.
3. The P-10s are not capable of producing prodigious SPLs in the bottom octave.
4. A tendency toward boombiness in the midbass.
5. Relative immunity to placement anomalies.

The number one clue to the gremlin that had gotten into the P-10s was the comment that the bottom octave was limited. Detection of looseness of the bass and midbass warmth further piqued my suspicion. A little detective work and some discussion revealed that the dealer who loaned the P-10s to SWW had opened them. And, since it is quite a distance from New York to New Mexico, LA volunteered to modify his P-10s himself.

I hypothesized that neither pair of speakers had been resealed properly. Leakage would cause the bass to be mistuned, diminishing deep bass response, creating a peak in the mid-bass, and losing control. But how much leakage was necessary to make the effect audible?

We had created a test procedure for finding even the smallest leak in the cabinet. A sine wave at system resonance (26 Hz) taxes the system the most, as this is the point of maximum energy transfer from woofer to passive damper. A match will be blown out by even the smallest leak: the sonic effects of a leak are myriad and devastating. Not only will bass response be affected as mentioned in the review, but detail, imaging, and speed are affected throughout the audible range. The speakers become soft and warm sounding.

LA was absolutely correct when he said that all energy in a speaker must be trans-

—LA

A decision he profoundly regretted. The Pentagram modification was horrendous! Any manufacturer who thinks a good review will result from that kind of reviewer torture is kidding himself.
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Audio Breakthroughs
transmitted as sound or dissipated as heat, but I contest the assumption that padding is necessary. An unpadded cabinet is basically adiabatic: all input energy is translated into output motion. A padded cabinet is isothermal: some input energy is translated into heat. The purpose of padding is to lower the "Q" (ratio of reactance to resistance) of the cabinet. The padding loses energy as heat, which shows up as the mechanical equivalent of resistance in an electrical circuit. By raising the resistance, you lower the Q.

But why lower the Q? Padding dissipates the most energy at the bottom of the frequency range, and increasingly with input level. Why clip the peaks and lower the energy in a most important area—the deep bass?

In order to minimize the effects of standing waves. Without padding, the standing-wave frequencies predominate in the mid-bass frequency range, disturbing the sound quality of almost all bass notes. Padding especially diminishes standing waves, since they incur loss with every reflection.

This seemed a poor solution to me. The Pentagram 5-sided leaning side design is patented as a solution to this problem. There are no parallel sides in a Pentagram, and thus no source of standing waves.

Research revealed that an unpadded cabinet had to be much more resistant to panel resonances, and required a tight seal. In the P-10, high density materials, and strategically placed internal braces are used to prevent panel resonances.

The statement that the speakers are not critical of placement is also not consistent with our experience. Although they deliver good sound in many speaker and listener positions, there is a best way of positioning them, and a sweet spot is created where the ultimate in three-dimensionality is heard.

With the grills off, the speakers should be well away from any wall or reflective surface, pointing straight forward (not toed in or out) and the listener at the top of an equilateral triangle created by him and the speakers. There should be no other speakers in the room. When the speakers have been set up this way, we have heard quadraphonic effects from a two-channel system.
The review, though, had much validity. We presently offer Counterfeet (by Sumikko) as an option. They mount at the two front corners, and the rear corner. Depending on the floor, they can greatly improve the clarity and specificity of image. The tightness and control throughout the audible range are also improved.

Experimentation revealed that the resistors in the crossover were affecting the speed, especially in the midrange crossover regions. They were smoothing the response in much the same way as padding smooths the bass. We resolved to design a crossover without any resistors. Only the cleanest parts could create a smooth, loss-free crossover. New, pure metalized polypropylene capacitors, Discrete Technology cable, and 12-gauge air-core coils, combined with new values and tighter tolerances, achieved our goal. No resistors, no padding, no loss.

As per LA's instructions, we will send P-10As to JGH; we look forward to your further comments.

Michael Levy
Bayside, NY

I don't think I've ever seen a poorer response to a bad review. If the leakage problem is so serious, why even mention the possibility of me modifying the speaker? If my modification caused leakage, why was the mid-bass problem the same before and after the modification?

I'm not a good enough acoustician to argue all the points raised above, but I do know that the energy not converted to heat will emerge as sound—in this case the sound of the cabinet. That's true whether the standing waves inside the cabinet are damped or not. Generally speaking, driver cones make better 'speakers' than speaker enclosures. The speaker enclosure resonates over a wide range of low frequencies. It's also beary, so it stores a lot of energy. All of the cabinet's output is time-smeared with relationship to the original signal. That's why, in my opinion, the mid-bass of the Pentagram P-10s sounded ill-defined and wooly. I hope the 10As are better.

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