IT'S LONELY AT THE TOP!

RECOMMENDED COMPONENTS

EQUIPMENT REPORTS:
SYNTHESIS LOUDSPEAKERS
AUDIO RESEARCH SP9 PREAMPLIFIER
ROWLAND RESEARCH PRE & POWER AMPLIFIER
COCHRAN DELTA MODE POWER AMPLIFIER
VERSA DYNAMICS & MICRO SEIKI TURNTABLES
CABLE & TONEARM LISTENING TESTS
THE CHEAPSKATE ON AMPLIFIERS
RECORD REVIEWS
because people like music
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**NOVEMBER 1987**
An International Point of View

I was recently privileged to attend both the SIM Hi-Fi show in Milan, Italy (SIM stands for Society for Musical Instruments—in Italian, of course) and the Penta Hi-Fi Show in London. My job was to represent Stereophile at each show, in the most pedestrian fashion: I sat or stood at a stand and sold both the most recent issue (Vol. 10 No. 6) and selected back issues of Stereophile to the hordes of audiophiles trooping by. This effectively removed me from my normal job of presiding over board meetings at Stereophile's glamorous headquarters and basking in the brilliant New Mexico sun. (!)

Most notable at these two shows was the indefatigable interest of international audiophiles. In Italy this was particularly poignant, as they were being asked to address the arcane issues of audiophile lore in a foreign language. Fortunately, the desire to experience music in the home as it originally sounded in performance is so great that it leaps across such trivialities as language difference!

Seriously, Italian audiophiles are devoted listeners and keenly interested in the most exotic equipment, particularly that from the US. Italy's national distributors are themselves devoted audiophiles, putting the kind of attention into their demos that in the US is done only by companies like Audio Research and Wilson Audio Specialties.

Audiophiles in England are, of course, different to (as they would say in the UK) their Italian counterparts. The most obvious difference is that the UK is home to countless hi-fi companies, ranging from garage operations producing low-budget equipment all the way up to international heavyweights such as Linn and KEF, more than can be said for Italy, whose lone high-end company of international stature is Sonus Faber (not yet imported to the US), and perhaps ESB. And the English are devoted to their sound systems, carefully investigating every audio lead in hopes of better sound or lower prices. Well, there's much more to be said—and it will be, next month, by JGH—but I see that I've run out of space. Thanks to everyone who took such good care of me on my trip abroad!
Scene the First. You are sitting in a concert hall, dead center, row M; the cellist walks on to the stage, sits down and starts to play the prelude to the first of Bach's solo cello suites, that intricate unfolding of a rhapsodic melodic line within the tight framework of an implied chordal structure. Melody, harmony, rhythm—none exist at any one point of time in this most exquisite of Bach's solo instrumental writing, yet the skill of the composer, coupled with the artistry of the musician, allow you to perceive the abstract as reality.

Scene the Second. You walk over to your record deck (or CD player), put on the black (or silver) disc of the first of Bach's cello suites, adjust the replay level, walk back to your chair, sit down, and... well it's not the same as the live experience, is it? The laying down of the musical line is the same, the musician's skill at realizing the composer's intentions is the same (or would be if the hubris of the producer and engineer had not unnecessarily intervened), but in no way do you think that you, the listener, have been transported to the concert hall.

But isn't that the raison d'être of high-fidelity sound reproduction? To allow the walls of your listening room to dissolve, and with them your own concerns, allowing the music to release your soul? Shouldn't the equipment act merely as the neutral pathway to emotional release? Why does it still signal fail to deliver the goods 100%, even with the highest of high-end playback equipment?

In previous essays on this theme in Stereophile, I have looked at ways in which the fundamental recording process too often robs us of any chance of recreating the original soundstage (Vol.9 No.8), and how the measurements thought important by engineers—often because they are the easiest to perform—rarely correlate with equipment problems that destroy the live illusion (Vol.10 No.4). What I would like to discuss here is how the nature of commercial equipment and system design in themselves can compromise the potential for musical enjoyment.

It was something said to me by Cambridge Audio's Stan Curtis which triggered this line of thought. We had been talking about the difficulties of a designer realizing his original engineering thought as a mass-produced "consumer durable." As Laurie Fincham of KEF has said, anyone can make a good-sounding prototype; the engineer's skill is tested when it comes to the consistent and cost-effective reproduction of that prototype, performance intact, on a large scale. Stan had found that the ubiquitous step of laying out a pre- or power amplifier's circuit on a printed circuit board introduced a sometimes surprisingly large degradation in sound quality, even though the circuit was identical to that of the hard-wired "bird's-nest" prototype. The increased complexity of the PCB traces, coupled with the perhaps less-than-optimum dielectric properties of the PCB material itself, and perhaps even the reduction of the circuit's physical realiza-
WHEN YOU SEE THIS...

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We have very carefully considered: metal purity, dielectric (insulation) material, mechanical stability, strand size, insulated strands, number of strands, variable size stranding, electrical and magnetic interaction between strands, skin effect, conductor size, conductor geometry, the relationship between the conductors and price. The results of this research are audible.

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tion from three to two dimensions, conspire to rob it of some of its sonic transparency.

Scene the Third. We return to our cellist, by now weaving his magic on the first cello suite’s two minuets. Assume that recording the concert is an engineer of that rare kind who just wants to capture the sound of the cello intact, placed naturally and coherently within its associated reverberant shroud, and, even more rarely when the recording is destined for commercial release, has had the time to position his (perfect) microphones at that spot in the hall exactly right for capturing the perfect balance between the direct sound from the instrument and its reverberation, without compromising the most musically desirable image perspective. (Those who feel that the recording and reproduction of sound is a science, not an art, should attempt some live recording. All the engineering theory in the world and all the understanding of acoustics can only take the recording engineer to the point where his artistic ability can have full rein.)

Putting aside for a moment the complexities of capturing intact the full sphere of ambience enshrouding the listener, also assume that the resultant recording (stored on a perfect storage medium, of course) is conventional stereo. This recording is now transferred both to CD and to LP for domestic replay. Unavoidably, losses in quality occur in both transfers, though whether that to silver is less damaging (as you might hear at an Audio Engineering Society convention) or more so (as you might hear at a gathering of audiophiles) is still open to debate.

Act Two, Scene One. You the listener, wanting to hedge your audiophile bets, buy the cello recording on both media. You run home from the store; being a reader of Stereophile, you want it reproduced in your own room with the utmost fidelity to the music. You pick up the CD first... but wait. If you want that maximum fidelity, then the CD player should be plugged straight into the power amplifier, with the shortest possible interconnects. Try it. I suspect that you will be surprised at the level of transparency you hear from your amp and speakers. The experience is not the same as hearing the cellist live, but it is certainly the best you have heard in your room from CD. And are those really the speakers that you thought to be a little muffled when you auditioned them in the store? Certainly they didn’t sound as good there as you had been led to expect from the review in Stereophile.

But the sound is too loud or too soft. No problem: add a passive volume control between the CD player and the amplifier. You would like to be able to play with the balance between the channels? Add a balance control downstream of the volume pot, the two being connected by flying leads fitted with RCA plugs to connect to the CD-player output sockets and the amplifier input sockets.

You suspect that the highs are now a little rolled off, the bass lacks a little drive and, horrors, there is an audible buzz when you dim the listening room lights to produce the best ambiance, along with some 60-cycle hum. Obviously, the CD player’s output stage is being asked to work too hard. You add a line-level amplifier stage downstream of the volume and balance pots, perhaps mixing in a little gain so that under-recorded CDs can still be played at an appropriate volume.

You feel that only to have one source is an impediment, FM being particularly good in your area; and what about your collection of open-reel tapes? It is possible to plug and unplug every source every time you want to use it, but that rapidly becomes a pain. No problem. Do away with the flying leads upstream and work up a little concoction of phono sockets and switches. You want to be able to record from CD or tuner and monitor from the tape deck? You want to be able to record from one source while listening to another? Add more switches. You might as well add level meters while you are at it, their input circuitry tapping into the signal at suitable points; suitable, that is, for the conveniences of wiring. And what about a second tape loop so you can insert some signal-processing equipment? Certainly there now seems to be something lacking in the sound. And perhaps those loudspeakers aren’t as good as you thought when you first played the Bach CD. How about adding some switching at the power-amplifier output so that you can choose between two different sets of speakers? The same switching could be used to mute both speakers when you want to use headphones.

Act Two, Scene Two. The realization strikes: of course, you’re listening to CD! The magazine writers always stress that even when it is very good, CD doesn’t approach the sonic purity of analog. You pull the LP of the Bach

Stereophile, November 1987
Your ears are acute enough to hear the ultimate reproduction that your system is capable of delivering. But does your system deliver? It won’t if you overlook one of its most important components, the interconnects.

Esoteric Audio Inter-Connects are designed to maximize the delivery of source signals. And that will aid your enjoyment of the best your system has to offer.

Ask your dealer for more details about Esoteric Audio interconnect systems or simply send $2.00 for our latest color brochure.

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RR 3 Box 262
Winder, Georgia 30680
Cello Suites from the rack—assuming that you still are interested in music and haven't become totally hung up on equipment—and put it on the turntable. Sounds terrible without an RIAA stage. Quiet too. With the exception of units from Threshold, Counterpoint, and The Mod Squad, you can’t buy an RIAA stage on its own to feed straight into a power amplifier, so you buy a preamplifier. At least it has all the controls and switching in a single convenient enclosure, with the circuitry mounted on a printed board for ease of manufacture and servicing; you can do away with the bird's nest of sockets and wiring you had interposed between the CD player and power amplifier. And with a real preamplifier, perhaps you can site it farther away from the power amplifier, so you don’t have as much walking around before relaxing to the music in your favorite chair.

Well, the sound is OK, you suppose, and it is convenient to be able to modify and route the signal with the minimum fuss. Ah, the Mets are on TV—how about buying one of those high-definition monitors to go between the speakers? Get a sharper image of the Doctor’s pitching. Get a videodisc player, too. And a Dolby surround unit.

Funny how listening to music seems to be taking a back seat these days. The intense enjoyment you remember from that Bach recording must have been some kind of one-shot event.

Act the Third. You read about this new kind of surround-sound system called Ambisonics. You snort derisively, having experimented with quadraphonics ten years ago and found it, particularly SQ, some kind of sick joke. But no, unlike those ill-fated, half-thought-out technologies, Ambisonics is not based on a poorly understood extension of the ideas behind traditional stereo. (Did none of the developers of quadraphonics notice that people may have an ear on either side of their heads but singularly lack the ones on the front and back for the correct decoding of spatial information at the sides?) Rather, it is based on the idea of recording the three-dimensional soundfield at the microphone position and playing back the appropriate signals from multiple loudspeakers so that that field is synthesized at the listener’s ears. All you need is more playback channels—minimum of three is required, but four would be ideal—with at least four loudspeakers. And all the additional switching and controls that are required. And the Ambisonics decoder box.

Yes, you are dissatisfied with the sound from your system. Obviously, this lack of a three-dimensional soundfield is the root cause of this dissatisfaction, and Ambisonics must be the future of sound reproduction.

Epilogue: Sorry, I don't think so. Or at least not yet. For over ten years now, I have been told that stereo reproduction is not enough, that creating a stereo soundstage between and behind the loudspeakers is all very well, but without the reproduction of the ambience from all directions, to the sides and rear of the listener, it will always be less than the live experience. Of the writers for this magazine, JGH and BS could be said to be committed to this philosophy, and they are undoubtedly correct. And equally undoubtedly, Ambisonics is the most promising method yet developed to achieve this goal.

In September 1 heard two very good Ambisonics demonstrations—by Minim at the London Heathrow show, and by Nimbus Records and Conrad-Johnson in New York. Yet—and I must stress that this is a personal opinion—I don’t think that adding more information to an already flawed playback system is the correct way of putting stereo reproduction to rights. As with our national listener above, the sound of a true stereo recording played back with what Martin Colloms refers to as the “shortest signal path,” the least complex one, can be stunning in its recreation of the musical experience. Add on the necessary circuitry, switching, and cabling to render your system suitably user-friendly, and the stereo reproduction will be compromised. It is a sonic analog of the Second Law of Thermodynamics: "Everything you add to a playback chain makes the sound worse." "Sonic entropy always increases," says the guru. Only when the sonic transparency offered by very expensive preamplifiers such as the Krell KRS2, Audio Research SP-11, Klyne SK-5A, or Threshold FET 10 (to mention four favored by Stereophile’s team of reviewers) filters down to the level of products everyone can afford, including CD players and power amplifiers, will it be time to talk about filling in the full sphere of ambience that existed at the original event. And to judge by JGH’s review of the Audio Research SP9 in this issue, there is still a long way to go before that can be taken for granted.
These anti-resonant chassis spacers are made with Kyocera's proprietary Fine Ceramics. Fine Ceramics laser guide shafts hold their tolerances five times longer than other materials.

These are the CD features they'll be copying next.

3rd-order analog filters cause less phase shift than the 7th- and 9th-order designs that others use.

Since Day One, every Kyocera player has had true 16-bit oversampling.

While our supplied remote controls are great, this optional full system remote control lets you operate a complete Kyocera system from anywhere in the house.

The front fascia of all our players is brushed aluminum, not plastic.

Our real wood side panels help damp resonance. They also look good.

Our real wood side panels help damp resonance. They also look good.
In May of 1983, Kyocera introduced a CD player with true 16-bit digital filters. Today, the competition's calling this circuit "the latest thing." Years ago we had four-times oversampling. This year every high-end player worth mentioning has a similar design. In September, 1984 Kyocera raised some eyebrows with the world's first Fine Ceramics anti-resonant CD chassis. Now the stores are full of flimsy imitations.

How did all these innovations happen to come from Kyocera, and not some household name? Perhaps because Kyocera's knowledge of digital circuitry comes from years of building computers for some of the best-known names in electronics. Perhaps because Kyocera is a world leader in Fine Ceramics, the technology used to house circuitry in aerospace and other advanced applications. Or perhaps because some top-rated CD players from other brands were actually made by Kyocera.

Now Kyocera has four world-beating Compact Disc Players, ranging in suggested retail price from $350 to the $800 model DA-710CX shown here. Each boasts technology so advanced, it's a preview of what the competition will be selling in 1989. After all, history does repeat itself.
Copycode & monopolies

Editor:

It was not so long ago in these United States that government considered as one of its functions the prevention or control of monopoliastic business practices. Alas, here we are in the '80s, control is a dirty word, and monopolies are beating down Congressional doors to demand protection. Not from piracy, as claimed, but from the threat of competition. That CBS, the most thoroughly vertically integrated recording company in the world, is leading the charge to Big Brother for protection, is no mere coincidence.

Here is a company who decides whether or not to record an artist based primarily on projections of potential mass-market sales. They produce the recording, manufacture it in various formats, distribute it through their normal network, and additionally market it through what is perhaps the world’s largest music mail-order company. I would not even venture a guess as to the number of radio stations they own or control to promote their product. Dare we ask how much influence they wield as regards the composition of radio playlists? It should be obvious that this company would wield a great deal of influence in Washington, DC, because they very obligingly collect sales tax for those states which tax recordings. Would a Congressman wish to offend someone who was faithfully collecting millions of dollars that would be otherwise uncollectable? Simply stated, CBS and many State governments are partners in the record business—"What’s good for CBS is good for the country."

Let us take a hypothetical case made possible by relatively inexpensive digital, or analog for that matter, recording: A local musical group of limited mass-market appeal decides to invest $5000 in both digital and analog recording equipment and add a recording engineer to its membership. This engineer records jam and practice sessions as well as live performances. The band then solicits donations from their live audience and fans, let us say, to upgrade their equipment or to finance a new album. As a gesture of appreciation for these donations, they distribute to contributors a free souvenir tape. Along with this tape, they also suggest to their audience that it would be most helpful if fans would send a tape copy to friends in other parts of the country in addition to their favorite local radio stations.

Multiply this case by 10 groups in perhaps 500 American cities and try to calculate the dollar amount of lost sales to CBS and the lost tax collections to dozens of states. Try to calculate the loss of control of radio airplay. What is a poor monopoly to do? Why, first outlaw some particular form of recording, and then any and all unlicensed recording, of course.

For today’s musical artists, the choice is quite simple. Would they prefer an almost certain and immediate income increase (often sizable) by self-production and distribution with the accompanying risks of piracy, or would they prefer to go knocking on corporate doors in search of the “big break” and juicy recording contract?

The even larger question is then raised in the monopoly mindset: My goodness, what if this really happens and then spreads to video? The supreme irony is that this has not been happening on any large scale, although the technology has been more than adequate for the last decade for artists to self-produce at reasonable cost. Mass mind conditioning seems to have been sufficient to discourage much serious challenge to the status quo. I suspect that many of us who have had any inkling of, or personal experience with, corporate recording tyranny, have been resentful of their attitudes for some time but have had no real inclination to rock their money boats.

With the writing now so clearly upon the wall, these tyrants go begging with crocodile tears for life insurance. Soon they will be proclaiming how many American jobs will be lost, if they should fall, while carefully avoiding any
mention of the thousands of artists who will begin to make a comfortable living. Many of us who have been only mildly resentful are now moved to righteous anger at the gall of these corporate crybabies. If they lack the resources to find some new and profitable way to gouge and control the public, they are unworthy of a corporate charter. Just ask President Reagan if this is not so. I'm certain there are others like myself who perceive this "crisis," and we also weep along with CBS and their ilk—but ours are tears of joy.

Ed Howes
Oracle, AZ

Copycode & Congress
Editor:
I want to express my appreciation for Lewis Lipnick's recent contributions to Stereophile. It's good to have these comments on aspects of our hobby from someone who is not only professionally involved in music but is also a hi-fi addict as well. Let's have more from him!

J. Gordon Holt's comment on the DAT/Copycode controversy in the August issue (Vol.10 No.5) was, as usual, well done. It helped inspire me to get busy and write my Congressman and Senators about this great threat to quality music. My letter read as follows:

"Re: HR-1384—Anti-copy protection of music recordings.

"As an audio hobbyist and long term (50 year) collector of classical music recordings, I am very concerned about legislation that would prevent the sale of digital audio tape recorder (DAT) machines unless they incorporate a device to prevent their being used to copy Compact Discs.

"I am concerned, not because I would like to buy such a machine and use it to copy CDs, but because the CDs would be altered by removing a narrow band of frequencies. The absence of this frequency band would be detected by the DAT machine, which would then shut down if an attempt was made to copy a disc.

"CBS Inc., the developer of this so-called Copycode system, contends that the sound of the altered CDs is not degraded, but this is disputed by a number of audio engineers and record reviewers who have heard demonstrations of the system. CBS has refused to release any technical details of the system or to give the editors or reviewers of the audio magazines any demonstration discs.

"Since the Copycode alteration is made on the master tape of the recording, it would also be present on conventional LP records or prerecorded cassettes made from the tape. Thus we would be faced with a major step backward in the ongoing quest for higher-fidelity sound reproduction. I, for one, will not purchase any recording in any form that incorporates the Copycode alteration.

"A possible, though perhaps difficult to implement, solution to the problem of unauthorized copying of recordings might be the imposition of a tax on blank recording tape. The proceeds of this tax could be used to compensate the record companies and artists. This would be unfair to persons who do not copy commercial recordings, but it would be far preferable to degrading the sound of the recordings.

"I strongly urge you to oppose any legislation that would require DAT machines to be equipped for the Copycode or any similar scheme."

Thomas C. Shedd
Wilmette, IL

The Ear Masters of Sonic Holography
Editor—Ear Masters of Sonic Holography: Often I have wanted to be gathered under the earlobe of sonic excellence, as a hen gathers her chicks under her wing for protection.

Alas, I have moved to a city where "high end" means a beautiful southern belle standing on the beach making a sand castle at her feet.

Upon receiving my last touch of reality, Vol.10 No.5 of Stereophile, I noticed an ad wanting writers in informed criticism of Jazz and Rock and other recordings.

Criticism! Informed criticism.

Now I understand your printing letters from readers.

I have been defending your rights to evaluate since my first issue of Stereophile.

I can criticize. Just ask my ex-friends. It seems that tact, in evaluating lesser audio equipment, is of some degree of importance.

Yes, that was me standing on that hill, absorbed in that ever-ongoing sonic excellence conversion all by myself.

I have a wide taste for music and feel that with the proper training, I could criticize according to the quality standards set by the
Precision audio instrumentation for those who require the highest fidelity in music reproduction. Elegant, refined, and durable.

Motif audio components possess an unrivaled ability to create the illusion of live musical performances.

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(703) 698-8581
Rock & Rollers (both of us) and Jazz lovers of *Stereophile*.

Obviously I'm self-sacrificing. I've graduated to the point where a bad recording is scoffed at instantly and denied further flagrant mismanagement of good Class C equipment.

Yes, you have risen to the needs of a nation. I'm proud to be a subscriber. I'm willing to make the sacrifice, to answer to the "high-end" calling, here I am, send me.

But wait. I feel so inadequate.

What is missing?

Self confidence? No.

Good hearing discernment? No, I tune my ears nightly by walking in the dark listening to my footsteps echo so as not to run into anything. Try that with two children under five. My evidence is 10 unbroken toes.

Let me see, what could it be.

Be, "B," that's it, Class B equipment.

That ever-furthering education, training, confidence in hearing what is really there.

Well, gentlemen, problem solved. Yours and mine.

You need criticism on music, I need my wife not to criticize my career-oriented need to upgrade.

Assuming that I wouldn't choose equipment meeting your high standard of excellence, I'm willing to accept any equipment you send, rather than money.

Please note that it may take several weeks of break-in, ear-tuning, and furniture rearranging before I can serve justly as a Music Reviewer.

Rest assured that your training, from past issues of *Stereophile*, has developed a keen sense of hearing in your pupil.

Thank you for this "life-reconstructing" opportunity.

Bryan Sesco
 Panama City Beach, FL

Common threads & cones

Editor:
A common thread in the setups of *Stereophile*’s review team (Vol.10 Nos.1, 2 & 3) is their preference for electrostatic and ribbon loudspeakers; that is, they choose mid- and high-frequency openness and delicacy over the solid low bass and realistically high sound levels possible with cones. When I recall auditioning a dealer's high-end setup of Snell A/IIIs and Apogee Scintillas, I can perfectly understand *Stereophile*'s preference. The Scintillas were spectacularly open and the Snells were boxy.

However, in Vol.10 No.1, a review of the Thiel CS3.5 cone speakers says, "We tend to take cone speakers far too much for granted," and goes on to describe the Thiel's sound as being in the same class as the Apogee Duetta II (a ribbon).

Well, if *Stereophile* is going to admit that cones are worthy of consideration for high-end state-of-the-art setups, it would be logical for you to review one of the highest-end cone speakers, the B&L 808. When the B&L 801F was reviewed by Larry Greenhill for *Stereophile* (Vol.7 No.6), its transparency and naturalness were described as "perhaps the best I've heard from a speaker." And it was noted that a brief audition of the 808 at the CES indicated that the 801's deficiencies may have been overcome.

There are two drawbacks to the 808. First, though they are big and impressive in a traditional sort of way, they will not cause the uninitiated to ask, "What's that? It doesn't even look like a speaker," the way electrostats and ribbons do. Second, the ratio of their price to that of their amplifier requirements is something the people at mass-circulation audio magazines might approve of. Whereas Scintillas are often paired with twice the price in Krells, my 808s are more than adequately powered by half their price in Threshold ($300).

If you like the sound you hear in a good concert hall at a live performance, try the B&L 808. When I listen to my setup after coming home from Carnegie Hall, I am not disappointed.

Kenneth A. Nakdimen, MD
 New York, NY

*One Comment, one criticism*

Editor:
I have read many publications that claim to be so-called experts in their fields. One standing out was *Digital Audio*, when it rated a Denon CD player with five stars and the CAL Temp- est—a most open and warm-sounding player, without any trace of transistorish sound—with four stars. The other magazine is *Stereo Review*. This magazine thinks either that everything sounds good or sounds the same. *Stereophile* is the first magazine I have read that really tells it like it is. You should be honored.

The criticism is that you should not take on
The conrad-johnson PV7 vacuum-tube pre-amplifier offers musical accuracy, elegant styling, careful workmanship, and reliable circuitry. Suggested retail price is $695.

For information write:
the conrad-johnson group
2800R Dorr Avenue
Fairfax, Virginia 22031
(703) 698-8581
any more challenges from manufacturers. If you do, Matthew Polk may approach you with a challenge that he can make his dynamic speakers sound like a planar of your choice—the Apogee Diva, for example. We sure don't need his white coat gracing your pristine pages.

Jeff Miller
Orchard Lake, MI

One thing lacking
Editor:
Warranty information is critical to any purchase decision, and reflects a manufacturer's confidence in his product. It should be included in the summary of every product reviewed.

Some time ago, you raved about the Allison 9 loudspeaker, and yet you don't mention it in "Recommended Components." Allison speakers are erroneously ignored by the high-end magazines.

Marc Richman
Washington, DC

And another
Editor:
I know you have to review the high-priced equipment to gain a reference, but I'm willing to bet most of your readers couldn't afford more than, say, $1000-$2000 for speakers, $500-$1500 for an amplifier or preamplifier, $500 for a turntable, and probably not all at once. Everyone is looking for the best deal, but we want something we can afford. You are not totally guilty of this, as many of your reviews are geared in this price range. I'd just like to see more.

Michael Russieri
Worcester, MA

Record reviews & CD
Editor:
I heartily approve of your recent decision to increase the recordings section of your magazine. I have been collecting records for some 40 years—I started at the age of 13—and have never felt as frustrated as during the past six months. However, I got most upset just the other day while reading a letter in Fanfare. A writer, reacting negatively to two recent reviews, complained of breakup of a female voice three times within 30 seconds on a CD and states that he tried it on three different systems, including one in a CD shop where many customers reacted as he did. He also complains of distortion on a track of a second CD. In reply, the reviewer suggests that the reader's CD machine is at fault (he never deals with the friends' or store's system). The reviewer also states that he has rechecked the two CDs on his system and finds nothing wrong. What has this critic played it on? A Yamaha A-760, a Sony CDP-101 CD machine, and AR-2 loudspeakers (the latter, he points out, are substituting for his currently incapacitated KLH-12s). Now, I can't comment on his receiver or CD machine—I'll leave that to others—but those speakers were outmoded more than 20 years ago.

I have seen other record reviewers in this and other magazines reveal their equipment to be just as bad—and yet they go on opining about the sound quality of recordings, oblivious to that fact that there is more on the discs and CDs than they realize.

CDs cost far too much. Prices are double that of LPs and, based on my experience, the chances are much greater that one will end up with the dog—and I don't mean a shaded dog. During the days of the vinyl record, I soon learned which labels to avoid. I stopped buying Columbias as they got shriller and RCA Dynagroove recordings as soon as I realized how bad they were contrasted with the older Shaded Dogs. I stopped buying Seraphim too, until recently when Seraphim started issuing relabeled EMIs. But I am relatively ignorant about CDs. I heard that Londons were the pits, for example, but I purchased The Daughter of the Regiment on the advice of Tom Miller of The Absolute Sound, and find it among the better ones. On the other hand, the mono Das Lied Von Der Erde, despite a colleague's recommendation, is distorted toward the end.

It's all very discouraging. In New York, at least, the record stores are slowly pushing out the vinyl LPs and replacing them with CDs. Tower Records' Fourth Street classical section has a ratio of floor space at the moment of about 50% CD to 50% vinyl—the latter seems to be getting smaller every time I visit. The major sources of LPs very soon will be used record stores and private collectors.

Obviously, the vinyl record is dead. One can keep playing one's records over and over. But what about the new performances? And what about those reissued classics now on CD that have been cleaned up? We all have to adjust. It's 1948 all over again. Does anybody out there remember how bad some of those first
The Home Theater

Where were you the last time a movie overwhelmed you? At your favorite theater, right? You felt transported to another place and time. The sound drew you into the story with an almost magical realism. You simply couldn’t experience it at home—until now. Shure Home Theater Sound™ decoders using patented Acra-Vector™ logic accurately recreate the exciting multi-channel sound of today’s very best theaters. Over 1000 discrete components and 60 integrated circuits combine to precisely decode special signals already on video tapes, discs and broadcasts. It’s a must for the ultimate theater experience.

Reference Brochure Available - Write us or see your Audio/Video specialist.

Theater Technology for the Home
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312-866-2608
A conflict of interest?

Editor:
Is the Lewis Lipnick who appears in your magazine the same Lewis Lipnick who has appeared in advertisements for conrad-johnson? Was he paid in any way for his endorsement in those ads? If so, I don't understand how you can allow him to write about c-j in your magazine.

"The sound through the new reference speaker system was musical and spectrally well balanced." Lipnick wrote about conrad-johnson's flagship Synthesis loudspeaker in his CES report in Vol.10 No.5 (p.63), "with believable soundstaging and excellent subwoofer integration."

I'm impressed by conrad-johnson products and, for all I know, his statement may be true. But it strikes me that allowing Lipnick to even comment on, much less praise, a company with which he already has a commercial entanglement is simply unacceptable for a magazine that aims for honesty in reviewing the output of audio manufacturers. At the very least, you should have included a disclaimer. Even if he wasn't paid for his endorsement, it still appears to be a conflict of interest.

Tom Redburn, Los Angeles Times
Washington, DC

Yes, Lewis Lipnick did appear in adverts extolling the virtues of Synthesis loudspeakers; the last appeared in Stereophile Vol. 9 No. 7, exactly one year ago. Mr. Lipnick also did a number of public seminars in the last year or so on behalf of conrad-johnson where he spoke about music and sound reproduction. He cancelled his connection with the company before starting to write for Stereophile on the subject of hi-fi equipment, rather than just on music. When it comes to his opinions, he is undoubtedly his own man, beholden to no one.

Regarding Mr. Redburn's feeling that there is a conflict of interest, part of my agreement with Mr. Lipnick is that he will not be asked to review any equipment from the conrad-johnson group. Regarding more general journalism, however, for him to ignore the company's existence would be a peculiarly artificial situation, akin to the way the United States pretended that there was no such country as mainland China for the first quarter-century of that country's existence. My feeling here is that, if something is as described, what matters most to the reader is that it be said, not who says it. In my opinion, the Synthesis reference loudspeakers sounded at least as good as SCES as described by Mr. Lipnick; having confirmed to my satisfaction that he described his honest assessment of the sound, I feel that the readers' interests have been protected against any possible bias. It is quite possible that in the future, Mr. Lipnick will be
For over thirty years Teac has been famous for building precision tape recording equipment. But, we're not willing to rest on our reels. So now Teac offers its most comprehensive line ever. From audio and hi-fi video recording equipment, to compact disc players, to graphic equalizers, speakers, and a complete line of audio and video accessories. One thing, however, will never change at Teac—our obsession with creating the most advanced, feature-filled, superbly executed audio and video equipment we can make.
equally negative toward this company’s products. In that event, I will be just as forthright about publishing his comments. —JA

Thanks
Editor:
Thank you for the generous offer of another year of 12 issues of Stereophile—all for only $24.00! Concerning your new monthly publication schedule—I am looking forward to when you publish daily, and still at the same old price!

Incidentally, Peter Sutheim and Will Hammond of Radio Station KPFK, Los Angeles, 90.7 FM, hosts of a regular program entitled “In-Fidelity,” Sunday, noon-1 pm, deserve much credit for advertising the Stereophile show in Santa Monica last March. I learned of it through them! The local stores did not carry any advertising or information!

David Dalton
Santa Monica, CA
We do indeed thank Peter Sutheim, Will Hammond, and KPFK for their gracious publicity. We hope all who came enjoyed themselves.
—LA

Someone did steal the bass
Editor:
Martin Colloms’ and Gerald Bearman’s responses to AHC’s “Who Stole the Bass?” (“No one stole the bass” and “Letters,” Vol.10 No.5) affirm the insular British disdain for reproduction of fundamental bass as something vulgar and strictly for Americans. They honestly believe that the only speakers for gentlefolk are hideously expensive shoeboxes. And with his condemnation of AHC’s views, Mr. Butler (“Letters,” Vol.10 No.5) has placed himself beneath contempt. (Mr. Bearman’s Mayware tonearm and cartridges perhaps deserve a straight-up review, though if he were really so sincere about Scientific Objectivity, he would have given up peddling analog hardware when Sony and Magnavox announced Perfect Sound Forever.)

High-quality little speakers are like castrati; the sounds they generate are exquisite, but what they cannot generate is vital. Bell Laboratories established years ago that people can reconstruct bass fundamentals mentally if the overtones are clearly presented. This is how you can distinguish Uncle Fred from Aunt Hattie on the ’phone. However, while I’m willing to accept nothing below 300Hz on the ’phone, this doesn’t apply to the hi-fi, thank you very much.

Last year I seriously considered Spica TC50s for my two-room apartment. Alone, they were charming but lacking. With a single servo-subwoofer they were better, but still lacking. Alas, the local dealers weren’t able to demonstrate them with a subwoofer for each channel. Then I started considering available space and funds. A pair of TC50s and subwoofers with appropriate stands would come to about $2000 plus tax. A pair of Vandersteen 2Cs with stands came to $1200 plus tax, and experimentation with a tape measure and stacked boxes revealed that they would take up negligibly more space. Fortunately the apartment is wildly asymmetrical and broken up with books, records, and thick upholstery.

Mr. Colloms was a bit disingenuous in stating his case; it’s not a choice between a VW Rabbit with all the subtle graces vs a wallowing Cadillac with nought but low-end torque. Has Mr. Colloms contemplated the Jaguar, which combines grace with guts? Richard Vandersteen drives one.

Reginald Stocking II
San Francisco, CA

Bass & the old Quads
Editor:
It was with greater than usual interest that I read DO’s article on the original Quad ESLs (Vol.10 No.5).

Several years ago, I began shopping for my first stereo. I was of the opinion, and still am, that the most important choice to be made was speakers. After an intense search for the right speakers had me totally befuddled, I was introduced to Quads. As soon as I heard them play I understood why I had been so confused. I had been listening to lots of speakers instead of to lots of music. My very first comment about the Quads was “This is the very best reproduced piano I have ever heard.” There was only a piano and Beethoven’s “Appassionata.” No speakers, just music. It was a magical moment, something I don’t think I’ll ever forget.

A pair of Quads by themselves (including the ESL-63s) is a delightful-sounding instrument, but for my tastes, quality alone will not make up for a lack of quantity. For me, the musics of overwhelmingly greatest worth are

Stereophile, November 1987
The Threshold models S/200, S/300 and S/500 now employ a proprietary optical bias system. The isolation and tracking accuracy of this system allows idling bias at levels significantly greater than so-called "high" bias class AB designs.

For example, the S/500 now idles at 320 watts allowing pure class A operation well into its rated power of 250 watts/channel. The S/300 and S/200 maintain pure class A operation that extends to corresponding ratios of their rated power.

Your Authorized Threshold Dealer will be pleased to provide full information and an audition of these new optically biased designs.

Threshold Corporation
4367 New Hampshire
Auburn, California 95603
big and powerful symphonies and loud, hard, heavy rock. I was really purchasing equipment for the music that soars rather than the polite chamber or jazz instrumentalists that are nice for reading or listening in the background. I needed more!

I ended up listening, therefore, to a pair of 24" Hartley subwoofers, three pairs of old Quad ESLs, and three pairs of Decca super-ribbon tweeters (crossed respectively at 92.5Hz and 7kHz). I love it and, having purchased all the equipment second-hand, I got a relative bargain.

I love my Quads; or, more accurately, I love my music. I need my subwoofers, for without bass, the music is thin and weak. I need my tweeters because flat sound is dull and lifeless. But the midrange is where we taste the flavor of the sound we're hearing, and where the old Quads are delicious.

Music is for love and fun and everything else that makes it so important to us. Equipment is important in the context that it brings that music to life through whatever there is in it that makes it work, and to my ears Quads are magic.

Keep up the good work. Stereophile is the only sound magazine keeping my attention.

Frederic Schwartz, DPM
North Dartmouth, MA

Help!
Editor:
Could Stereophile perchance help me? I would like to correspond with someone in the USA on mid-fi and high-end hi-fi and almost everything else. I feel that Stereophile may be a means whereby I can accomplish this end, it being one of the two worthwhile hi-fi magazines in the US market. (As for the other magazine, I believe that this epistle may be beneath HP, et al.) So please, if anyone on the Stereophile staff has offspring about 18, or knows someone about 18-ish with a fanatical interest in hi-fi, who would genuinely like to strike up a correspondence and not drop it after a fortnight, give my name and address to them.

Robert Wilson
34 Marigold Crescent, Bournmoor, Houghton-le-Spring, Tyne and Wear DH4 6BP, England

An eminent experience
Editor:
I wish to report a very good experience during the installation of my Eminent Technology Tonearm II. Although the instructions that came with the arm are fairly thorough, because I wanted to make certain I did all the steps perfectly, I found I was generating a lot of questions that I believed could only be competently answered by the manufacturer. Therefore, I contacted Eminent Technology on numerous occasions during the installation and setup as well as later on when I believed I had a problem with my new turntable. The vast majority of the time I found myself conversing with the designer himself, Bruce Thigpen. Mr. Thigpen was always pleasant, courteous, helpful, generous, and patient. In fact, I've never known of a pest having been treated so well. If only all high-end equipment could be backed up like this. Mr. Thigpen deserves a lot of praise for the way he deals with his customers and backs up his product.

I wish him the very best in all his future endeavors.

Robert B. DeBellis
Miami, FL

A cheapskate cable?
Editor:
Congratulations on an excellent magazine. I have subscribed for 15 years and Stereophile is better than ever.

I read DO's recent interconnect cable reviews (Vol.10 No.2) with great interest, but as I was greatly shocked at the prices of many of the better cables, I'd like to recommend an affordable alternative. A "cheapskate special"— sorry Sam, I unconsciously plagiarized your column's name—is Mogami Neglex 2534 cable. You can buy it for $1/foot from Old Colony Sound Lab, PO Box 243, Peterborough, NH 03455. You have to put on your own connectors—a real pain—but I think the results are worth the effort.

Neglex cable seems to work well with my high-impedance, vacuum-tube equipment, sounding better than several other highly regarded (and much more expensive) cables which I have tried. It has a warm, relaxed sound with a "big" midrange, slightly rolled-off highs, and a large soundstage. It erra on the side of musicality and romanticism. As I play 78s as well as LPs and am a hopeless romantic, this is ideal for me. I can't vouch for how it sounds in low-impedance, solid-state applications, although I suspect that it won't sound as good. Also, people who like "ac-
audible results with the finest in connecting components.
accurate" sound may not like it with any equipment, tube or solid-state.

William R. Hitchens
Mountain View, CA

Faith in Sam
Editor:
Kudos and my gratitude to Stereophile in general, and to the Cheapskate in particular. After turning matters over and over in my mind, and reading and rereading various reviews in Stereophile and other mags for a length of time befitting an audiophile (a very long time approaching infinity, I think), I finally decided to put my faith in Sam.

I contacted Euphonic Technology and purchased a new CD player to replace my second-generation Japanese player. Let me just say the difference was far from subtle. This one change of equipment effected a total transformation of my system, bringing out the best from my other components, and justifying not only its own cost but that of the rest of the gear, as well as of a CD collection.

I think Stereophile does its greatest service to its readers when it brings fledgling companies like Euphonic Technology to their attention. Reviews of equipment from established firms are great, but it is in deciding whether or not to deal with a new firm that readers most need help.

Howard Martin
Stoughton, MA

A commendation for Sam
Editor:
I have been a subscriber to your esteemed journal for many years, but this is the first time that I have ever been moved to write to you. I would like to commend your reviewer Sam Tellig for his review (Vol. 9 No. 7) of the Euphonic Technology CD modification. As a result of the review, I contacted this company and purchased their new 16-bit 4x oversampling version of the Philips CDB650. This is the only CD player I have ever heard that truly challenges the best analog front ends. I do hope that you'll look into this unit as it truly deserves to be auditioned by music lovers interested in the best and most natural-sounding CD units.

Ronald L. Wilkinson
Washington, DC

But disagreements, nevertheless
Editor:
What makes high end such a source of interest to me is its great margin for disagreement and controversy. Many topics in high end are matters of taste. Most choices made in assembling an audio system involve a judgmental balance of compromises. With this in mind, I would like to challenge some of the findings of your reviewers.

I found Anthony Cordesman's review of the Kiseki Purple Heart Sapphire cartridge in Vol. 10 No. 5 to be superficial and erroneous. In his introduction to the cartridge survey, Mr. Cordesman insists that the underbody of the cartridge be parallel to the record surface for proper setup. This is not true. The cartridge underbody should only be parallel to the record surface as a starting point for adjusting VTA. Thereafter, one's ears, not measurement, should be the final arbiter of what is the best VTA, and therefore underbody alignment. That Mr. Cordesman was unhappy with the Purple Heart's high-frequency performance comes as no surprise, as this cartridge functions best when the end nearest the tonearm pivot is closer to the record surface than its distal end. Make the cartridge parallel to the record and, indeed, high frequencies turn harsh and the upper midrange thins out.

Moving on, I found Dick Olsher's review of interconnects in Vol. 10 No. 2 to be less than useless. Although his brief introductory discussion of cable theory and design was good, I cannot believe he considers the Monster Cable M1000 to be a high-end product. Given the fact that cables are very system-dependent, I found putting this cable in my system tantamount to placing heavy, wet canvas grilles in front of my speakers. "Veiled, dampened, and constricted" are adjectives that barely describe the sound I heard. Two local dealers, one of whom actually sells the M1000, agreed with me.

Mr. Olsher reviewed Siltech interconnects extensively, yet they had no US distributor and were unavailable for auditioning. Was this due to unforeseen and uncontrollable circumstances or faulty editorial supervision? Did someone forget to check into Siltech's distribution problems before going to press? I highly recommend that your staff refer to Peter Moncrieff's IAR Hotline #46-47 as an example of an exquisitely accurate assessment of the state of the art in interconnects.

Finally, as a general criticism, I find your reviews to be tilted in favor of product descrip-
"McIntosh . . . no other transistor amplifier is capable of reproducing as well."

"All the sounds, even those different one from another, remain separated and distinctive. There results a sensation of contrast, precision, and uncommon clarity.

. . . A close analysis of different frequencies reveals an extremely deep bass, very rich in spatial detail . . . The upper bass region is very linear testifying to an extraordinary richness of information. The very structured mid-range contributes enormously to listening pleasure.

The feeling of power is never refuted and instead of stunning the listener, the 7270 recreates an audio environment of a majesty that no other transistor amplifier is capable of reproducing as well."

Need we say more?

—REVUE DU SON, foremost French stereo magazine.

For information on the McIntosh MC 7270 Amplifier and other McIntosh products write:
McINTOSH LABORATORY INC.
P.O. Box 96 EAST SIDE STATION, DEPT. S17
BINGHAMTON, NY 13904-0096
tion and technical background at the expense of describing the sounds heard. I recommend that every product be evaluated against a fixed checklist of subjective, listener-oriented performance criteria. The list should include at least the following: tonal balance, neutrality, and character of bass, mid, and high frequencies; soundstage presentation (height, width, depth); imaging focus and specificity; transparency; inner detail; and dynamics resolution and extension. Reviewers should refer to specific recordings in order to exemplify their findings so that listeners may more easily duplicate them. I really don't care if Mr. Cordesman found it difficult to relate emotionally to the Kiseki Purple Heart's bass and soundstage. I would have preferred that he cited specific deficiencies found in the rendering of specific recordings.

Doron Schwartz
Richmond, CA

I am sure that Mr. Cordesman took the time to ensure that the Kiseki was producing the best sound of which it was capable in his system. As Mr. Schwartz points out, many high-end topics involve personal taste, and the balance of compromises made by the Kiseki's designer is more sympathetic to the needs of Mr. Schwartz than of Mr. Cordesman. Similarly with Dick Olsher's interconnect review: be called 'em as be saw 'em. As Editor, I hope that his conclusions will travel, will prove to be valid to other systems and environments, but where personal taste comes in, this cannot be guaranteed.

When the interconnect survey was begun, the Siltech cable was imported by Assemblage. At the time the survey was published, Assemblage was dissolved, but the product was of such international significance that we went ahead and included it. Siltech is now distributed by SOTA Industries, PO Box 7075, Berkeley, CA 94707. Tel: (415) 527-1649.

Regarding the review specification outlined by Mr. Schwartz, many reviews published in Stereophile do conform very closely. It must be pointed out, however, that, as Alvin Gold has recently mentioned (although I can't for the life of me find the specific reference), reviewing is the art of generalizing from the particular. In the kind of review mentioned, where a large number of products are surveyed—I must admit that this is my least favorite kind—what matters most is the destination, the overall assessment, not the journey the reviewer took to arrive at his results.

—JA

Carded long-wool batts
Editor:
Please note in your source list for carded long-wool batts, that the Rio-Grande Mill of New Mexico is no longer in business.

Our company has begun to produce stereo batts for the former Rio-Grande customers. The cost is $9.50 per pound plus UPS. We can be contacted by telephone at (800) 334-0854, ext. 598. We accept VISA/MC.

Aspen Mtn. Wool Co.
PO Box 507, La Jara, CO 81140

AIDS
Editor:
Living in San Francisco, a city hard hit by the AIDS epidemic, I have lost friends to AIDS and currently have friends living with AIDS. They are the ones who must need our support as they try to cope with having a terminal illness that can be both painful and disfiguring.

I am upset at the insensitivity shown in Stereophile (Vol.10 No.6, p.133) by J. Gordon Holt's "joke" regarding AIDS. An apology to readers, especially those whose lives have been affected by this tragic disease, is in order. I hope that Mr. Holt gains an awareness that AIDS is more than a story on the news, that it affects the lives of real people, and, I'm sure, readers of Stereophile.

Alan Voorhees
San Francisco, CA

You are right, an apology, not only to AIDS sufferers and their friends, but to the country as a whole, is necessary. JGH's intent was undoubtedly humorous, but poorly placed at this time. We are sorry for the pain this must have caused you and others who are closely affected by the AIDS epidemic. —LA

—

Stereophile
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see page 199

Stereophile, November 1987
TURBOCHARGE YOUR CD PLAYER.
THE ELITE A-91D INTEGRATED AMPLIFIER.

Now that the compact disc has taken the world by storm, ordinary amplifiers are failing their driving test. Because ordinary amplifiers simply can't handle the dynamic range and purer signal that digital sound delivers.

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When it comes to digital sound, there's no such thing as good vibrations. That's why the A-91D uses a special anti-vibration honeycomb design in the chassis frame. In isolation barriers between electronic sections. Even in all five insulator feet. A large aluminum volume control knob with a specially balanced brass shaft also absorbs distortion-causing vibration, and printed circuit boards are mounted in rubber for the same reason.

The A-91D is not only ready for digital, it's ready for the future. With six digital inputs (2 optical), and three digital outputs (1 optical).

So if you want your digital sound to drive you to new heights, you need to drive your digital components with the Elite A-91D.

For more information, call 1-800-421-1404.

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Adcom GFA-535

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

Wrong, of course.

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

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

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

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

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

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

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

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

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

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

"Does the GFA-555 sound any better?"

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

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

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

Suddenly, it hit me what this meant. Conventional wisdom had been dealt a severe blow. You know, the old saw that you should never power a good pair of speakers with a cheap amplifier. Here was a cheap amp—one of the cheapest on the market—that sounded good with Quads, Spendors, later Vandersteens. Probably Thiels, too—at least the CS1. What it means is you can stretch your speaker budget a bit and get the speakers you really want, then economize by buying an Adcom.

Adcom 535
GFA-535 for $299.95. True, you may be a little power shy, but probably not much. And to say the least, the GFA-535 would make a decent interim amp.

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

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

My only criticism, and it’s more of a quibble, is that the speaker connectors are nonstandard and unique (so far as I know). You insert bared speaker wire into a hole and twist the connector tight a quarter turn. Most speaker cables will fit, but some will not. Certainly MIT won’t. Neither will the best Kimber, the kind with eight clumps of strands. The less costly four-clump Kimber will, and proved an excellent choice. My sample amp was quiet—no hum—and ran cool. There are selectors for two sets of speakers. And the 535 looks nice.

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

In its price category, the Adcom GFA-535 is not only an excellent choice; it’s the only choice. The real question is whether you should buy one even if $299.95 is much less than you planned to spend for an amp—ie, whether you should put the money into a better CD player or pair of speakers instead.

**B&K ST-202**

No long discussion here, because the B&K ST-202 ($595) sounds like what it is: a more powerful version of the B&K ST-140. For an extra $150 or so, you get 150Wpc instead of 100, a bigger power supply, more heatsinking...in other words, a bigger, beefier amp. The ST-140 may not be up to driving certain speakers—the Magnepan MG2.5 and MGIIIA come to mind—that the ST-202 can handle with ease. On the other hand, the ST-202 is probably a waste with speakers like the Quad ESL-63 or the Spendor SP-1s, for which an ST-140 is fine.

The ST-202 shares all the strengths of the ST-140: a smooth, sweet, tubelike midrange, combined with a high end that seems to roll off ever so slightly and lack the nth degree of definition. Snare drums, brushed cymbals, and the like just don’t have the snap, crackle, and pop they do with some other amps, including the Adcom GFA-535. And the B&K ST-140 and ST-202 lack the harmonic detailing that makes the Eagle 2A and the PS Audio 200C (and maybe also the new 100C) so remarkable.

What you get, though, are amplifiers that sound smooth, sweet, and musical, if not exquisitely detailed. You also get something else that’s tubelike, and very hard to describe. It’s that old tube/analog “palpable presence” I keep raving about. The B&K amps have a very special way of creating atmosphere—air around instruments and vocalists. They are remarkable amplifiers for the money, but they’re not perfect. If you want perfection, I suggest you try a Hafler XL-280—it’s been “proven” perfect, so you don’t have to trust your ears or worry about how it sounds. You don’t have to read any more reviews, either; they’re all a waste of time.

And what about the $599 Sumo Polaris? Well, I think that while as far as detail and transparency are concerned, both amps are about equal, the B&K ST-202 is a better buy—more power and more presence (that old tubelike transparency through the.
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ROTTEL

High performance. Down to earth.
midrange). Sorry, Sumo, but I think B&K has wrestled you to the ground.

**B&K or Adcom?**
The B&K amplifiers, as I have often said, sound tubelike. They work best with speakers that are very extended and very neutral, and particularly well with speakers that tend to be unforgiving in the upper midrange and treble—lean, clean, quick speakers like the Quad ESL-63, Spendor SP-1, Thiel CS-2, and Epos ES-14. Adcom amps may be more appropriate with speakers that tend slightly to warmth—the Vandersteen 2C comes to mind.

Mostly, though, it comes down to a matter of personal taste. What kind of sound do you want? I would carefully audition amplifiers from both Adcom and B&K with the speakers I have or intend to buy before coming to a decision. In other words, don't buy one without hearing the other. Of course, if $299.95 is your limit, then your choice is easy: Adcom. I hope the success of the GFA-535 inspires John Beyer, of B&K, to market his own $300 amplifier.

**Onkyo M-504**
In the ads for the $4400 Onkyo M-510, the grandaddy of this $799.95 amp, Onkyo says the "M" stands for "magic." In a way, that's appropriate because, on the grandson, at least, the M *doesn't* stand for magic. It doesn't quite stand for music either. Perhaps the M is for mediocre.

But let's not be too harsh. This amp is no more so-so than the Sumo Polaris, and no worse than the Quad 306, which retails for $600 and is rated at only 50Wpc; the Onkyo M-504 is rated at 165Wpc into 8 ohms. The Quad 306 is such a beautifully styled amp, though, and ingeniously constructed—all the works on a drawer. And the 306 pairs perfectly with the Quad 34 preamp, with its unique tonal balance controls.

The problem with the Onkyo is not that the product is poor, but that the expectations are so high. Onkyo would like you to believe they are a serious audiophile company, but they seem to want it both ways: mass distribution *and* a class image.

There is no mistaking the M-504 for anything but a Japanese amp, with its plastic woodgrain side panels and illuminated power meters that dance in the dark. There are conveniences, however. There's switching for two sets of speakers. And there's protection against turn-on/turn-off transients. There's protection circuitry, too, but Onkyo assures me the amp performs well into low-impedance loads (no power ratings are given into less than 8 ohms).

A dual-mono design, with separate transformers for each channel, the M-504 is well-built and should prove as reliable in service as my wife's Toyota Camry. And while it offers fair value for the enfeebled dollar, this amp might have listed for around $650 two years ago and sold on the street for around $500. It is not
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Audition this acclaimed loudspeaker at your nearest high end dealer.
particularly price-competitive, even at what is likely to be its typical street selling price.

And the sound? Let's lead off on a positive note. This is a very powerful-sounding amp, by which I mean that with most speakers, most of the time, the amp coats along with ample power in reserve. I could not get it to clip with Quad ESL-63s, Spendor SP-1s, or Epos ES-14s. It is a neutral amp. Bass is tight, firm, not overdone—the B&K ST-202 sounds a bit bloated at times by comparison. The midrange is smooth, treble unfatiguing. I don't think this amp could possibly give offense to anyone.

But the more I listened, the more conscious I became that something is missing. Subjective, of course, but it seems that the edges have been rubbed off the music. The amp sounds too smooth, too polite. The sound is not interesting. I do not hear the wealth of harmonic detail that I hear with the Eagle 2A, PS Audio 200C, or even the Adcom GFA-535. Nor do I get the naturalness of timbre I find with such tube amps as the conrad-johnson MV-50, or with tube hybrids like the Counterpoint SA-12. To put it another way, I could not hear into the music, which is the basically the same problem I have with the Sumo Polaris. Something is missing: the "magic," perhaps.

conrad-johnson MV-50

Most audiophiles are male, and many males are into this macho thing with amplifiers: they think they need lots of power. So they don't even consider amps like the little Adcom or the $1485 all-tube conrad-johnson MV-50. Don't get me wrong. I like power, too; it's ultimately why I decided I could not live long-term with the Jadis JA-30. There's nothing wrong with an amplifier that can kick ass, but it's not the only thing that matters.

"The MV-50 is something of a tough sell," one salesman told me, "unless the customer is already a tube believer. Converting someone is difficult." Well, maybe not all that hard. The difficulty, I suspect, is that few bother to give the MV-50 a serious listen.

Like most other tube amps I've met, the MV-50 clips gracefully, almost inaudibly, at first, which means you can run it closer to clipping; the 50Wpc limitation may not be that limiting at all. If the amp clips a little, so what? You probably won't notice.

Also like most other tube amps I've encountered, the MV-50 lacks some bottom-end punch; the bass is not particularly solid, tight, or extended. On the other hand, it is not a flabby mess.

What you get with the conrad-johnson MV-50, and what I never quite got from its two predecessors the MV-45 and MV-75, is the midrange magic of tubes. The MV-50 has the transparent, pure, see-through (hear-through) quality of the very best tube amplifiers; it has that "palpable presence" in spades. Even the Jadis amps—the JA-30 and JA-80—don't quite have it the way the MV-50 does. If you have a Marantz 8B or a pair of Marantz 9s, you'll know what I'm babbling about. As for the Quicksilver mono tube amps, the MV-50's obvious tube competitor, I'll withhold comment until I hear the new version with KT88s. The

conrad-johnson MV-50

Stereophile, November 1987 35
With discerning appreciation for the experience of good listening, music lovers in 18 countries have demanded Monitor Audio loudspeakers for excellence in engineering and aesthetics in sound and form.

Monitor Audio has earned its enviable reputation as one of the world's premier creators of audio loudspeakers with accolades such as the 1987 Loudspeaker of the Year Award.*

Manufactured in England and designed to reproduce the stunning reality of compact disc and digital recordings, Monitor Audio loudspeakers employ the world's most advanced metal dome tweeter technology matched to closely tolerated components. Cabinets are finished in the finest real-wood veneers, among them mahogany, oak, walnut, rosewood, teak and the uniquely stunning Kenya Black.

* Best Buy*** recommendations show Monitor Audio to have the added virtue of value for money.

Audition the entire line for its breathtaking accuracy, wide dynamic range and unparalleled clarity.

Speaking volumes for an audiophile's pride of possession since 1972, Monitor Audio loudspeakers are a superior sound system's voice.

Model R352, 'best loudspeaker' What Hi-Fi? Awards 1987

** Hi-Fi Choice 1986/87.
"Best Buy" Awards
old version did some things better than the MV-50: better bass, for instance, and a more extended treble.

There is something about the way a great tube amp handles harmonics that makes you forget or forgive any weaknesses. Listen to strings, woodwinds (especially tenor sax), female voice, and you know this amp is telling you the truth in a way that a solid-state amp never does, although some come close.

Weaknesses? Aside from the bass, there is a roll-off in the treble that, while not objectionable, robs the music of a certain sparkle. In fact, it is this aspect rather than the lack of deep, tight bass which for me is the most serious drawback. But the MV-50 has the touch; perhaps the "MV" should stand for "magic valves."

**Counterpoint SA-12**

And now, the $1000 Counterpoint SA-12, which I should have placed before the MV-50 to keep the price in ascending order. But I wanted to wind up with the SA-12 because, well... it’s the best all-around amp I’ve heard in its price class. The SA-12 is the amp I recommend if you have the money to step up from, say, a B&K ST-140 or ST-202.

Naturally, I tend to believe that tubes have something to do with the terrific sound: specifically the four 6DJ8s that form the amplifier’s driver stage. (The SA-12 uses eight MOSFETs, four per channel, in the output stage.) The SA-12 sounds tubelike in a way that no solid-state amplifier I’ve ever met does, not even the aforementioned B&K amps or the best class-A solid-state amps.

One thing you will notice about the SA-12, particularly during warm weather: it runs hot. The amp’s output must be heavily biased into class-A and the SA-12 is quite capable of raising the room temperature by several degrees. A cozy amplifier, then, but you probably won’t want to sit too close. Another reason not to sit too close is the transformer hum—noticeable when the room is quiet, but not noticeable (in my room) over the music. A toroidal transformer would have been quieter, but larger and more expensive. I can live with the problem.

The SA-12 succeeds at doing exactly what it tries to do: give you most of the musicality of tubes, along with the efficiency and economy of solid-state. Thus, you get a smooth, delicate midrange, with tubelike timbres—smooth, sweet, natural. The harmonics are right.

As for the treble, it’s quite good—more extended and detailed than either of the aforementioned B&K amps—but not quite in Jadis territory. The treble is just a mite untidy, compared to the likes of Jadis, Threshold, and Krell, but there is little of that MOSFET fuzz or haze I have bitched about with other amps, including the B&Ks.

Bass is quite good, but not outstanding. It could get deeper, be tighter; it is sort of like a cross between tube bass and good solid-state bass. And the midrange, glorious though it is, does not quite have the see-through, hear-through quality of the all-tube Conrad-Johnson MV-50. Also, the SA-12’s soundstage seems to be pushed forward: the MV-50 (and the B&K amps) have a deeper, more laid-back soundstage, while the SA-12 has a slight tendency to throw things in your lap.

I could name this or that amp (usually more expensive) that does this or that thing better than the SA-12, but I know of no other $1000 amp that gets it all together better: natural timbres, harmonic accuracy, smooth midrange, detailed treble, adequate power in the bass, and good dynamics. The SA-12 can drive moderately difficult loads like the Magneplan MGIIIA and Martin-Logan CLS, not to mention the Quad ESL-63. True, the amp could be even more detailed and harmonically transparent, and more balsy, but you have to pay much more to do significantly better overall. At this price point, there have to be compromises. The brilliance of the SA-12 is that the compromises do so little to detract from one’s enjoyment of the music.

If you want a Counterpoint preamp to go with the SA-12, take the $995 SA-3.1 over the $595 SA-7.1. The SA-3.1 is well worth the difference.

Incidentally, the SA-12 sells for around $1800 in Britain, and still **Hi-Fi Choice** hails it as an outstanding buy. For a grand, it’s a steal.
Introducing Vintage, Sansui's collection of components created for the discriminating listener. The performance story starts inside the AU-X901 integrated amplifier which is designed to bring you sound previously associated only with separates.

Sansui's exclusive "Alpha" X-Balanced technology works together with balanced inputs to address the problems of today's noisy RF home environment. It also reduces potentially negative ground influences from both the power supply and the counterelectromotive current from speakers, thereby producing cleaner, purer sound.

With 130 watts per channel; the AU-X901 delivers 390 watts of dynamic power at 4 ohms. Key features include: anti-resonant Excelite PC boards; a massive transformer; a balanced power supply; high-grade capacitors; and discrete componentry.

*130 watts per channel, min. RMS, both channels driven into 8 ohms from 20-20kHz with no more than 0.005% THD.
THE OUTSIDE STORY

The Vintage performance story continues on the outside. Sansui's AU-X901 features a double chassis to reduce resonance and provide heavy shielding, plus a strategically placed fifth foot to further reduce resonance. Coupled with gold-plated terminals and balanced inputs, the result is sound clarity.

The front panel has been ergonomically designed for ease of operation, and the handsome piano finish is additional proof of the quality within. Both inside and out, the Vintage AU-X901 delivers the kind of sound you want to hear.

For further information, call or write: Sansui Electronics Corporation, PO Box 624, Lyndhurst, NJ 07071 (201) 460-9710.
BI-WIRING

James Boyk experiments with loudspeaker multiwiring
I've been interested for some time in the technique of bi-wiring, in which separate cables are run from an amplifier's output to each section of a loudspeaker's crossover. This year in the Music Lab of my course here at Caltech ("Projects in Music & Science," EE/Mu 107), we had a chance to try quad-wiring of our Spendor BC3 monitor loudspeakers.

Mr. Bruce Tiemann, a student in my course, had been intrigued by a Hi-Fi News & Record Review article in which Martin Colloms reported improvements in the sound of several loudspeakers when modified so as to be able to be bi-wired. Mr. Tiemann determined to try this with our Spendors. As always, the project turned out much more time-consuming than anticipated!

The Spendor BC3 dates back to the mid '70s, and is a BBC-pedigree, reflex-loaded monitor using four drive-units: a 305mm Bextrene-cone woofer, with its dispersion altered by a "slot," crossing over to a 200mm Bextrene-cone midrange unit at 500Hz, which in turn crosses over at 3kHz to a Celestion 38mm fabric-dome tweeter, the response of which rolls off acoustically above 14kHz; a 19mm dome supertweeter fills in the last HF octave. Crossover slopes are third-order, and the crossover circuit is one of the most com-

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1 James Boyk is Lecturer in Electrical Engineering and Pianist in Residence at the California Institute of Technology.
2 HFN/RR June 1986, p. 51
Every home audio component company has their own area of expertise. Some manufacturers concentrate on new inventions and patents. Others focus their efforts on reducing costs and producing lower priced components.

More important than being the first or the cheapest, Luxman components are designed to achieve their sonic best. The engineers at Luxman have dedicated a lifetime to perfecting existing technology for sonic superiority.

In the beginning.
Lux Corporation of Japan, Luxman was originally named, was established in 1925 to design and manufacture high quality radio tuners for a fledgling home radio industry. The word “lux” is a scientific measure of illumination and was immediately applicable to a company that was seeking to build a “bright” future.

From this modest beginning, the Lux engineers continued to design and develop the internal parts or audio components, and in 1934 assembled a unique vacuum tube amplifier that highlighted our state-of-the-art transformers. Our transformers delivered wider bandwidth and lower distortion than the competition, earning Lux an immediate reputation for quality and performance.

In the 1950’s, unique tube technology and the use of high quality transformers became the trademark of our quest for audio excellence.

In subsequent years, Lux began exporting to the European market and received numerous accolades for amplifier designs. In 1961, the introduction of negative feedback lifted the amplifier industry

today’s technology has become Luxman’s forte. In 1985, Luxman introduced the world’s first hybrid integrated amplifier: BRID... a unique combination of tubes and FETs that epitomizes the musicality of live performances.

Internationally recognized as a sonic milestone for moderately priced amplifiers, this “BRID” design became the catalyst of a whole new level of public awareness of the sonic integrity of Luxman components.

The most recent developments by the Luxman engineering group redefine the industry standards in three distinct categories:

1. ULTIMATE POWER.
Luxman has perfected sonic reproduction with amplifiers that capture the warm musicality associated with vacuum tube amplifiers, plus the high power needed for today’s digital source material.

2. DIGITAL DIRECT.
Luxman engineers have perfected the musical reproduction of digital source material by transferring the information in its digital form and converting it to analog in the integrated amplifier.

3. SYSTEM REMOTE.
Luxman engineers have perfected the convenience of remote control by allowing full system operation from anywhere in the house.

Luxman is... technology perfected.
plex to have been used in a commercial loudspeaker design. Fig.1 shows the circuit, reproduced from Martin Colloms' *High-Performance Loudspeakers.* After verifying that the two speakers in the pair really did sound the same, and at my suggestion, Bruce Tiemann traced the crossover circuit direct from the board (fig.2). It turned out to differ from the published circuit, both in that pairs of capacitors in parallel were nearly always used to get the values indicated in the circuit diagram, and in that the actual speaker used an autotransformer in the supertweeter feed rather than to the tweeter proper.

Once the circuit had been determined, Mr. Tiemann cut circuit-board traces so that separate hot and ground connections could be accessed for each driver. These were hardwired with short lengths of cable (the whole project used Kimber Kable 4PR generously supplied by Ray Kimber), and the cables were terminated with dual banana plugs. The four two-conductor cables (one for each of the four drivers) were led through the reflex vents in the front panel of the speaker, as can be seen in the photo. The other speaker was left untouched in order that it could act as a reference.

We put banana plugs on our amplifier cables so that we could stack the amplifier plugs with the driver plugs in any way we wanted. (These banana plugs are the type that will plug into each other as well as into banana jacks.) Stacking each of four amplifier cables to an individual driver cable gave true quad-wiring. Using just one amplifier cable and stacking it to all four driver plugs gave us a speaker which was normally wired except for the last three feet to the drivers. Finally, stacking all four amplifier cables together with all four driver cables gave us what amounted to single wiring, but with an amount of copper between

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3 Pentech Press, Estover Road, Plymouth, Devon PL6 7PZ, England

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Stereophile, November 1987

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Clearly . . .
The best seat in the house!
speaker and amplifier equal to that in the quad-wiring. I’ll call these three wirings “Q” for quad, “SI” for single-wired with one cable, and “S4” for single-wired with four cables.

We listened to LPs, master lacquers, and cassettes via our modified Dynaco Mk.VI power amps and a Music Reference RM-9 power amplifier, which had been kindly lent to us by its designer, Roger Modjeski. The cassettes were played on our new Nakamichi Dragon, the generous gift of Nakamichi Corp. in support of the Music Lab’s work.

All of this was very informal. We were trying to get a feel for the subject, and we don’t pretend to any rigor. For instance, the cables changed the area of the vents in the modified speaker, thus possibly changing the bass response. We accepted this, partly because it is quite difficult to think of any alternative way to do things that would not invalidate the experiment or require some rather subtle woodworking. It would have been a good idea to insert very short lengths of cable in the vents of the unmodified speaker, but we didn’t do this.

Listeners included Bruce Tiemann and myself; Oliver Collins, who was also a student in the course; and F. Brock Fuller, of Caltech’s math department. All agreed that true quad-wiring (Q) was best of the three wirings described above. And in some way the Q sound was better than the stock speaker. For instance, in the song “Amanda,” from the Sheffield Lab Creme de la Creme cassette released by Nakamichi, the “clang” of the railroad-spike hammering sound was much more convincing than through the unmodified speaker. And there seemed less hangover on the repeated bass notes in the introduction to “I’ve Got the Music in Me,” on the same cassette. Articulation generally seemed better, and the voices of Amanda McBroom and Thelma Houston seemed more “present.”

But it wasn’t just these things that changed. The frequency response of the speaker was different, too. We attempted to get an idea of the differences by running our Dragon into a Dynaco SE-10 octave equalizer and then through the RM-9 amp into the speakers. We experimented to find the settings which made the stock speaker as close as possible to the modified one (also run through the SE-10, but with the EQ off). The results of this very coarse procedure were that wiring SI was down 1dB at 240Hz, up 1dB at 1.9kHz, and up 1dB at 3.8kHz relative to the stock speaker. Wiring Q was up 1dB at 30Hz, down 1dB at 240kHz, up 1dB at 1.9kHz, and up 1dB at 8kHz.

The question is, how do you separate the EQ effects from legitimate differences due to multi-wiring? In other words, were the voices more present because of the quad-wiring, or because the response was up 1dB at 1.9kHz? To separate the two possibilities, one needs an equalizer—it would probably have to be custom-made—that can exactly match the differences between the “multi-wired” speaker (whether it’s bi-, tri-, or quad-wired) and the unmodified reference. This would allow listening to stock vs multi-wired speakers with the frequency-response differences eliminated. Then one could indeed hear if quad-wiring itself made a difference.4

No one seems to have done this test, though it is crucial to any valid judgment about multi-wiring. Perhaps the speakers used for other workers’ experiments have not changed their tonal balance when bi-wired? We also tried bi-wiring with the BC3s—in two arrangements, bottom driver plus the other three, and bottom two plus top two—and these didn’t sound like stock, either.

The stock Spendor BC3 speaker is, in my judgment, superior overall to any of the modifications we tried. It was tonally more neutral, had better driver integration, and caused less listening fatigue. I don’t find its superiority surprising, as the crossover is very complex and the design (by Spencer Hughes) is subtle. The various crossover sections could well be intended to “talk” to each other; that is, to interact; and it’s easy to imagine that the additional wiring could upset the interaction. For instance, the SI wiring did not sound like the stock speaker. Yet the difference was only the lengthening of the interconnections by six feet of cable (three feet on each section).

So, our conclusions: Yes, multi-wiring changes the sound, and to a surprising degree. No, it’s not just due to more copper between power amp and speaker, because S4 was not the same as Q. But also no, multi-wiring is not necessarily better!

Obviously, more work needs to be done along the lines I’ve indicated above.

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4 If, of course, the equalizer was not itself introducing any change in the sound. —JA

Stereophile, November 1987
The only people capable of showing

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Most important of all, the 705ESD has a direct digital output stage for the digital needs of tomorrow.

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The TA-E77ESD Preamp provides three digital inputs for direct interfacing with both current and future digital components, plus decoding at three different sampling rates. It also has a digital processing loop for high-quality recording.

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A BALANCING ACT

I read Dick Olsher's review of interconnects in Stereophile (Vol.10 No.2) with more than passing interest. Although he modestly states that he was "just out to satisfy myself," he not only rates the cables at hand but also makes a lot of important points of general interest in his technical analysis. There are a few areas, though, which I think warrant further investigation. DO hinted at AJ van den Hul's preference for balanced connection, but doesn't pursue the reasons why. DO also stopped short of explaining why some cables "lock in" to a system and others don't. Finally, I think that the relative value of cables for the sound of an audio system should be underlined more clearly. "Upgrade your system with better cables" is like saying: "If you don't like the way your car drives, buy a new set of tires." Important as good tires are, they will not make a Porsche out of a Beetle.

There is more to the interaction of stereo components than the cables in between, and that interaction is actually more predictable than "buy the most expensive interconnects and hope for the best on your system" (which, by the way, is not an attitude that DO is guilty of).

Let me explain.

What happens to the signal as it flows, for example, from preamplifier to power amplifier is not only dependent upon the properties and qualities of the interconnects, but on the totality of parameters at the interference of the two components, such as:

• Circuitry of the output stage of the preamp
• Is it balanced or unbalanced? Does it have a transformer? Is it DC-coupled?
• Output impedance and output voltage of the preamp
• Type of plug, number of pins, dimensions, material
• Type of interconnect
• Circuitry of the input stage of the power amp, its input impedance, and the voltage necessary for full gain

All of these parameters bear on the quality of sound that one will ultimately achieve. They also determine whether a cable "locks in": for every system there are cables which allow optimal interface; they are "right," regardless of price. Unfortunately, in the framework of most cable reviews, the totality of parameters is neglected. As a result, too much weight is put upon the singular properties of interconnects, and phenomena such as "locking in" are treated as if they strike like fate itself.

That ain't necessarily so, as we shall see. There are two basic layouts for a signal path:

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1 Dieter Burmester designs amplification products bearing his name and is based in West Berlin
Dieter Burmester describes the benefits of balanced signal flow

balanced or unbalanced. This refers not only to the makeup of interconnects, but also to the architecture of electronic components. Balanced design has been used in studios for years, but never gained much favor in consumer electronics because it is complex and expensive. The advantages in sound quality, freedom from distortion, and predictability of interaction with cables, on the other hand, are such that I believe (as does AJ van den Hul) that they cannot be ignored. Conventional unbalanced design, it seems to me, has reached a point where further gains in sound quality are painfully small but very expensive. So, for most high-end manufacturers the basic thrust these days seems to be toward solid but not outstanding high-end sound, and making electronics more affordable. Manufacturers of the best gear know about the inherent weaknesses of unbalanced design, and become ever more sophisticated in working around them in tiny increments. In contrast to this, balanced design does away with most of these weaknesses, consequently offering more than marginal

Stereophile, November 1987
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sound improvements.

Here’s why:

In a conventional system (fig.1), the separation of positive and negative signal flow ends at the tonearm plug. There it is picked up by coaxial cable, which means that positive-going current from the cartridge flows through an inner “hot” lead. At the same time, an identical backflow of negative-going current runs through the shielding back to the cartridge. Obviously, the conditions for each leg of the flow are not exactly the same. The hot lead has quite different electrical properties from the shielding because it has a much smaller diameter, a different structure, and consists mostly of different material.

That’s not all. The function of the shielding is, as the name says, to shield the hot wire from modulating interferences, such as transformer hum or RFI. Hence, the backflow of the signal is not protected, but subject to intermodulation.

What applies to the tonearm/preamp connection is also true for the preamp/power amp interface: Different conditions exist for the two legs of the signal path, and the negative flow is subject to modulating interferences.

In addition, unbalanced design holds further disadvantages (fig.2). As a rule, all components have metal housings to protect the internal signal paths from distorting influences. To achieve this they have to be connected to the signal grounding. Under certain conditions, the housing is also grounded to the AC outlet for electrical safety. Now the negative signal can form a hum loop through interaction of shielding/signal grounding and housing/AC-grounding. A two-pronged plug is the answer to hum, but not, unfortunately, to electrical safety.

Another problem also has to be addressed which defies easy solution. For various reasons, the enclosures of different components will almost never be at exactly the same potential. Hence, a compensatory alternating current will flow via the signal grounding and cable shielding, thus modulating the negative portion of the signal. Using a direction finder, one can determine which way to plug a component into the wall outlet to minimize this current flow, but it cannot be eliminated. There are also other problems with the multiple use of signal grounding inside the components, but I won’t pursue them here.

Is all this old hat and irrelevant for the sound anyway? I think not. Let us look at a common moving-coil system with a maximum output voltage of 500uV, and assume for LP playback a dynamic range of 60dB. That means that the lowest signal voltage flowing from the cartridge is one-thousandth of 500uV, or 500 nanovolts (500 billionths of a volt). Given a common input impedance for an MC system of 100 ohms, this results in a minimal signal current of 5 nanoamperes, or five billionths of an ampere.

Most preamplifiers supply 1V output for full gain, but for normal listening levels one needs only about 50mV. Assuming a dynamic range of 60dB and a common power-amp input resistance of 50k ohms, we end up with a signal current of one nanoampere (one billionth of an ampere) or less. Considering these
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minuscule currents and voltages, it seems hard to believe that they translate into a clean musical signal at all. However, it's easy to see that it doesn't take much to introduce distortion. Most susceptible are the high frequencies, which make up the smallest voltages in the signal spectrum. At the same time, they are crucial for the quality of musical reproduction because they are responsible for the recreation of overtones which determine the sonic imprint or character of individual instruments.

They also supply ambient information for the location of a sound source in a three-dimensional recording space. Their distortion will result in smeared images and an unstable, as well as shallow, soundstage. In other words, those parts of the signal spectrum which really separate the high end from mid-fi are most in danger of getting lost or being distorted. It seems only natural to try to do everything to protect them.

The way to do this is balanced design, where signal path and shielding/housing mass are completely separated (see fig.3). Not only the interconnects, but also the signal path within the components provide identical conditions for the positive and negative legs of the signal flow, and both are shielded against modulating interferences. Components can be grounded without fear of hum loops, and compensatory voltages between different mass potential can flow through shielding and housing mass without influencing the signal.

Balancing an interconnect is the easy part. All you need is a twin-lead cable and a three-pin XLR. The problem is the realization of a balanced design within a component, which not only requires special circuitry, but also the existence of whole subsystems in identical duplicates, for positive and negative signal flow. Because of their long cable leads, commercial studios have been using balanced connections for a long time, albeit in a very limited fashion. For the most part they still use conventional equipment, achieving balanced signal flow between components via output and input transformers. I do not consider this adequate; my company has been concentrating for more than 10 years on developing and perfecting electronics which provide a balanced path for the audio signal from the cartridge to the speakers.

That ain't cheap, but is it worth it? You bet! If you like resolution of the finest musical details, outstanding ambient imaging, unfiltered dynamics, tightly controlled bass, transparent yet sweet highs, and extremely low distortion, then balanced design is the way to go. And, by the way, since the properties of twin-lead cables are much less change than those of a dizzying array of coax designs, the choice of the right cable becomes much easier.

If the preamplifier's output stage is capable of delivering a reasonable amount of current—I must modestly admit that my balanced-technology Burmester preamplifiers are so capable—it is beneficial to increase considerably the signal current to the power amplifier. The increased current will carry more of the signal spectrum and make its smallest contributors less susceptible to interferences. All the user has to do is add a resistor between the
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It's no secret that the Audio Research SP11 hybrid preamplifier has secured its reputation in esoteric music systems around the world. Now, Audio Research introduces some of the SP11's acclaimed hybrid technology in a simpler, less costly format.

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positive (hot) and negative (cold) leads of a twin-lead cable at the signal receiving end. This is possible with RCA as well as XLR connectors.

On the other hand, if you’re not ready to chuck your old system, you may yet profit from reading thus far. You can improve your unbalanced interconnects by approximating a balanced signal flow. Just use twin-lead cables with RCA connectors, and solder the shielding only at the receiving end to the negative lead (fig.4).
THE MINUTE AMPLIFIER QUIZ

1) What amplifier was purchased by California Audio Labs for the quality control listening tests of their CD?

2) What amplifier was purchased by America’s largest analogue record pressing facility for quality control listening tests?

3) What amplifier was purchased by Duntech to demonstrate their studio monitors?

4) What amplifier was purchased by a leading European University for psycho-acoustic listening tests?

5) What amplifier received the 1987 Consumer Electronics Show Design and Engineering Award?

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The LP is the highest-fidelity musical source available to the consumer. While it is commonly held that compact discs sound as good or better, numerous comparisons of CDs and LPs made from the same analog master tape have revealed a consistent preference for the LP (Greenspun and Stromeyer 1986; Greenspun 1986; Fellgett 1983) among naive listeners, audiophiles, concert-goers, opera lovers, and designers of the best audio equipment.

To extract information from LPs with the minimum distortion requires a precision front end, consisting of cartridge, tonearm, turntable, and preamplifier. This article describes the procedures we used for determining which of two tonearms would produce a more lifelike sound when installed in our reference systems.

Traditionally, a tonearm test is carried out by mounting a tonearm and cartridge on a turntable, listening for a few hours or days, then swapping with another tonearm and listening some more. We feel that this is an inadequate approach. Because tonearms are generally difficult to mount properly, so much time elapses between the presentations of identical material that listeners' aural memories tend to be stretched (especially if the differences are subtle). In addition, the fact that the test is not blind engenders a risk that prejudices will affect the test results.

Anyone with access to a good-quality tape recorder can perform a blind test that avoids these problems, as described below under "listening." Such a test can be carried out in a reasonable amount of time, without master tapes or special equipment. Our results show that listeners found clear audible differences between the two tonearms and that one was strongly preferred.

Since our subjective tests showed a clear preference for one arm, we sought to find objective correlates, described below under "measurements." Both tonearms measured well, but these measurements do not explain the listeners' preferences, which leads us to conclude that careful blind subjective tests are valuable.

We compared the Eminent Technology 2
Charles E. Stromeyer III and Philip Greenspun carry out a blind comparison

air-bearing, linear-tracking arm (the ET), and a new unipivot arm from Graham Engineering (the Graham arm). Various versions of the ET arm have been described in detail (Moncrieff 1984; Benjamin 1985; Cordesman 1985; Colloms 1986; Long 1987). We selected the ET because of the uniformly favorable reviews it has received; the Graham arm because of its clever design and enthusiastic recommendations from users of the product.

Tonearm Descriptions

Despite its large size, the ET arm is rigid and light; it is constructed mainly of rigid plastic and lightweight material. It allows precise alignment of the cartridge, including stylus rake angle (SRA) adjustment while the record plays. The arm tracks linearly, using an air bearing pressurized by a remote air pump. The bearing is sufficiently low in horizontal friction (in the plane of the record) that stylus force directs the tonearm laterally (radially inward). However, the bearing does not allow rotation of the cartridge in the azimuthal plane (orthogonal to the record and arm-tube planes—such rotation would prevent the cantilever from being perpendicular to the record viewed from the front of the cartridge).

The ET arm must be mounted with great care, using a jig available from the manufacturer. Set-up is difficult, and the arm can easily be knocked out of alignment, possible requiring a complete remounting with the jig.

Robert Graham, an audiophile who designs equipment for MIT's Lincoln Laboratory, sold an earlier version of the Graham arm to McIntosh in 1980. Although McIntosh intended to put the design into volume production, they went through some lean times and could not justify the expense necessary to finish the design and retool for production. Graham reacquired the rights to the design in 1982 and made a limited number that have been sold by Natural Sound in Framingham, Massachusetts. Volume production was scheduled to begin in the summer of 1987.

Graham Engineering's arm is constructed with brass, aluminum alloys, and other metals. The alloy parts are black-anodized, and the brass is gold-plated. Graham claims that the
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failure of past unipivot designs to charm audiophiles was due to the use of inadequate bearing materials and unfortunate balance arrangements. The Graham arm's bearing consists of a downward-pointing tungsten carbide pivot tip (attached to the moving assembly) resting on an upward-pointing tungsten carbide bearing cup (attached to the base assembly), resulting in a loading on the tip greater than 100 tons per square inch. Graham claims the following advantages over other bearing systems: lowest possible friction for a mechanical design; only one path for vibrations to travel along, thus providing a better approximation to a mechanical diode (a system that passes vibration in one direction, but blocks it in the reverse direction); unlike ball bearings, the Graham bearing has no play and thus will not wear, vary with use, require adjustment, or develop chatter. We have made no measurements that would confirm or disprove these claims.

One very nice feature of the tonearm is that it is in neutral balance (the center of gravity is essentially colinear with the arm-tube axis). This, coupled with the low-friction bearing, allows the cartridge to negotiate a record warp with little change in the tracking force. When the cartridge is raised ½" above the record, the downward restoring force (corresponding to an increase in tracking force from the point of view of the stylus) is just 0.03 grams. Most tonearms are in stable balance (with the system center of gravity lower than the pivot), and exert a large restoring force when the cartridge traces a warp. A large force will substantially vary the tracking force and thus the vertical tracking angle.

Following an idea first seen in a design by Dynavector, extended side weights near the pivot and below the center of gravity discourage the tonearm from rotating in the azimuthal plane (ie, rotation about the arm-tube axis). These weights serve much the same function as the weighted pole carried by a tightrope walker. The side weights are angularly positioned so that record warps will not cause the cartridge to rotate in the azimuthal plane.

Graham has controlled tonearm resonance with the following design features: the tonearm tube is exceptionally dead, consisting of a high-magnesium-content aluminum-alloy outer shell and a stainless-steel inner shell, the space between filled with damping material; the mechanical diode effect of the single pivot point guides what excitations remain into the heavy brass mounting base; the pivot is damped with light silicone fluid; and the counterweights behind the pivot are attached with sorbothane mounts.

Both tonearms sprout short, flexible electrical leads that terminate in RCA phono jacks; the user can select any standard interconnect cable. The ET is awkward to use, and suffers from a noisy air pump. The only operational shortcoming of the Graham arm/Oracle turntable combination that we tested is that the cartridge can be knocked into the record label area. The cartridge can then fall into one of the holes in the Oracle record clamp. As the clamp rotates, the edge of the hole will contact the stylus, ripping the cantilever from the cartridge.

The ET arm retails for $850, including air pump, and the Graham arm is expected to sell for under $1200. The Graham arm is covered by US Patent 4,587,646 and some pending patents, so full information can be obtained by sending $1 to the US Patent Office.

Test Preparation
Two basic approaches can be taken to ensure a fair test. The simplest approach is to use the same cartridge and turntable with each tonearm. Another is to get two identical records, cartridges, and turntables, then mount and use one tonearm in each to make up two complete sources. Using the second approach, one would have to run the same tests twice, switching the tonearms from one record/cartridge/turntable to another and hoping that intersample differences among the other components didn't swamp the tonearm differences. We chose the first approach.

To avoid the long switching intervals necessitated by tedious tonearm set-up procedures (particularly for the ET), we used a tape recorder, which also made it easy to keep the test blind since listeners had no opportunity to observe either tonearm in use. The tests were conducted with an audio system unfamiliar to most of the listeners, who had no opportunity to hear either tonearm playing any records before the test. This precaution would be unnecessary if one were only interested in establishing that listeners could identify which tonearm was the source, but is possibly important if one is trying to establish
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Top Retail Experts Personal Views About The Energy 22

Sassafras, Philadelphia, P.A. - Charles Hardesty

- Bob Morgan. “As Philadelphia’s premier high end dealer we had the good fortune to introduce the Energy 22 to our market. Since then the reaction has been incredible from audiophiles and music lovers alike. We believe the Energy 22 represents the pinnacle of loudspeaker design – anywhere near its price range.”

Designatron, Long Island, N.Y. - Charles Caccuito. “Never before have we experienced a speaker system which exhibits the level of realism that the Energy 22 provides. The excitement generated by Energy speakers is only exceeded by the pleasure of owning them. The Energy 22 sets a reference standard by which all other speakers must be judged.”

Audio Associates, Washington, D.C. - Mike Zazanis. “The Energy 22 is a very musical speaker at a very inexpensive price that easily could cost a lot more money.”

Pro Musica, Chicago, IL - Ken Christianson, John Schwarz. “The Energy 22 Reference Connoisseur & Pro Monitors simply outperform the competition. Musically satisfying to the most demanding listeners.

Classic Stereo, Ft. Wayne, IN. - Paul Pohnert. “The Energy 22 Reference Connoisseur and Energy 22 Pro Monitor are the most musically correct speakers we have sold. They deliver excellent stereo imaging; are very intimate when music is intimate, yet powerfully dynamic when music is dynamic.”

Audio by Caruso, Miami, FL. - Don Caruso. “The Reference Connoisseurs are among the most neutral, uncolored speakers we have found!!! They provide very relaxing listening.”

Shelly’s Stereo, Los Angeles, CA. - Robert Coyle “The Energy 22 and ESM speaker line offers the consumers styling and value at a price no other speaker line can match. The performance rivals the world’s finest speakers.

Sound Company, San Diego, CA. - Bob Kokley. “Over the years we have heard many promises of new breakthroughs in speakers with disappointing results. The Energy 22 is one of the only products which performed beyond those promises. A job well done.”


The Sounding Board, Berkley, CA. - Jim Serena. “The Energy 22 is an outstanding speaker. What’s incredible is the value, compact size and its performance level.”
a preference (since a listener might recognize
the sound of one arm).

We used a consumer open-reel tape deck,
the Tandberg TD20A SE, with Maxell XL-1 tape
with the "special equalization" curve (Tand-
berg's recommendation, which we would
come to regret). We recorded at 15ips half-
track, which gives a frequency response flat
within 2dB from 20Hz to 30kHz, and a sig-
nal/noise ratio of 80dB (a consequence of the
special equalization circuit), according to Tand-
berg. Although it is unlikely that a tape recor-
der and tonearm will have complementary col-
orations, it is best to use a high-quality tape
recorder like the Tandberg.

So that only one of us would have any way
of knowing what was on the tape, Stromeyer
did all the recording. He selected 19 pieces of
classical music, each lasting approximately one
minute. He divided up the tape into 19 sec-
tions, each twice as long as the piece to be
recorded (a real-time counter is helpful here).
After carefully mounting one tonearm, he
recorded the 19 pieces, randomly picking the
first or second half of each section. Stromeyer
mounted the second tonearm and filled in
the blank sections with the same 19 pieces, now
played with the second tonearm. We thus ob-
tained a tape with 19 pieces, recorded back-
to-back in a randomized ordering.

We used a six-month-old Monster Alpha 2
cartridge and an Oracle Premiere turntable.
Tracking force was set to 2.0 grams. Since we
were comparing a linear tracking tonearm with
a pivoting tonearm, it was impossible to make
the tracking geometry identical for both. We
were anxious to have precisely the same SRA
with both tonearms, although we were not
particularly concerned that the SRA be optimal
in any sense.

In a procedure suggested by Alan Goodwin,
the thoughtful proprietor of Goodwin's in
Cambridge, Massachusetts, we first clamped
and precisely leveled the platter. With the
Alpha 2's stylus guard pushed firmly into place,
the cartridge was placed on the Oracle platter
mat. We placed a precision level on the top of
the tonearm and leveled the tonearm tube
with the SRA adjustment. This resulted in the
cartridge body lying approximately parallel to
the record surface with the tracking force
applied and the stylus in a record groove.

We equalized the phono signal with an
Audio Research SP10 II preamplifier (100 ohm
input impedance), and passed it to the tape
deck through FMS blue interconnect cables.
If the same arrangement is used for both
tonearms, the choice of preamplifier is not
especially critical.

Despite the fact that a recording-studio
owner discouraged us from using Maxell tape
because he felt it to be of low quality, we de-
cided to follow Tandberg's recommendations
so that we would not have to rebias the re-
corder for the Scotch or Ampex tape that pro-
fessionals normally use. We purchased the tape
at a high-end salon ($30 for a 10" reel). After
several runs through the tape, we noticed that
the entire transport and the area underneath
the recorder were covered with oxide. No
oxide shedding was observed when we used
Scotch tape, so it was clearly a problem with
the Maxell product.

The tape we had taken so much trouble to
make will therefore eventually self-destruct
and become useless as the oxide flakes off
(although we noticed no dropouts after about
six plays). Either the tape is defective or was
damaged in storage. Several other reels of Max-
ell XL-1 purchased from a high-volume tape
discounter proved acceptable.

Listening Panel and Playback
Systems
We assembled a panel of nine listeners, in-
cluding Greenspun, Bob Graham, and several
audiophiles. For each section (out of the 19),
the listeners would generally hear the entire
section played straight through twice (so the
sequence was ABAB) before writing down
their opinions. The listeners wrote whether
the first or second half sounded more realistic,
commented why, and rated the degree of dif-
ference. Not all listeners were present for the
entire test, and listeners were allowed to refuse
to judge a particular section.

Stromeyer operated the tape recorder and
did not judge the sound or interact with the
listeners. Although he had made the tapes
some weeks before and had forgotten the
ordering, his potential subconscious knowl-
edge of the ordering makes this a single-blind
test. Had Greenspun operated the tape re-
corder and Stromeyer not been present, the
test would have been double-blind. The dis-
tinction between double-blind and single-
blind testing is most important when the ex-
perimenter interacts with subjects or has some
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control over the trials. In our test, the volume levels were fixed and Stromeyster only operated the tape transport when requested to do so, so we would not expect different results in a double-blind test. The listeners were forbidden to communicate with each other, and kept their writings hidden.

Most of the judgments were made with full-range electrostatic speakers in an asymmetrical room with a hardwood floor (Sound Lab A-1 speakers, driven by an Audio Research SP11 preamplifier and Rowland Research Model 7 mono amplifiers). Approximately one fifth of the judgments were made with dynamic speakers in a square room with a carpeted floor (KEF 105.2 speakers, driven by the SP10 and an Audio Research D70 II power amp).

Subjective Results

Considering the 19 musical selections in toto, the majority of listeners preferred the Graham arm for 11 pieces and the ET for 5, with 3 draws. If we assign a point value of 3, 2, and 1 points for high-, medium-, and low-confidence preferences, the results are even more in the Graham arm's favor. Table 1 lists the point scores for each piece, and table 2 the pieces where one tonearm was preferred over the other by 4 or more points; 5 out of 6 of these choices were for the Graham arm.

Listeners generally characterized the Graham arm as offering increased clarity, presence, drama, and air. Increased brightness and dryness were frequently mentioned, especially with baroque instruments, and this was not especially welcome on some recordings. The ET arm was frequently characterized as somewhat smoother and richer sounding, though at the expense of detail and realism. Listeners noted few differences in stereo imaging.

In these blind tests, there was a decided statistical preference for the Graham tonearm, which was judged clearer, more lifelike, and typically somewhat brighter. For some pieces there was essentially unanimous preference for the Graham arm (as with the first-rate Messiah and Mozart flute quartet recordings).

Bob Graham, the designer of the Graham arm, picked his arm as sounding better 13 times out of 19 and picked the ET 6 times. Of the high-confidence trials, he picked his arm as sounding better 4 out of 5 times. The Sound Lab speakers, associated playback equipment, and recordings used were entirely unfamiliar to him, nor had he met either author before.

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the test; we felt justified in including his results in our data.

Greenspun picked the Graham arm 12 times out of 19, the ET 6 times, and found one too close to call. Of the high-confidence preferences, he picked the Graham arm 7 times out of 11, the ET 4 times.

Listeners, even the non-audiophiles, were quite content to participate in the test and did not find it frustrating (in contrast to some blind interconnect cable tests that we have attempted). The 40-minute tape took about 1½ hours to play, with repeats and pauses for writing down comments. Many of the people who listened through the electrostatic speakers so enjoyed the music that they actually thanked us for inviting them.

**Subjective Lessons**

We were quite satisfied with our subjective test procedures. Listeners did not have trouble hearing differences. Aside from the Maxell tape problem, we are completely satisfied with the performance of the ancillary equipment used to conduct the test.

The main improvement would be a test involving three presentations of each piece. The first would be a copy of the master tape. The second and third presentations would be the same passage reproduced through the two different tonearms. We were unable to do this test because we didn’t have access to master tapes. We were therefore unable to determine which tonearm produces a sound closer to the master tape.

It is possible that the mix of recordings we selected is somehow biased in favor of one or the other tonearm, since a flawed recording might sound better played through a flawed tonearm than through a neutral one. We think this unlikely. It is also conceivable that had we used a different cartridge, tape recorder, turntable, preamplifier, amplifier, or pair of loudspeakers, the results would have been different.

Having finished with the subjective testing, we now turn to objective measurements to see if there is a correlate for the increased clarity and brightness of the Graham arm, or for the slightly increased richness of the ET arm.

**Measurements**

Our primary interest in conducting frequency-response measurements was to find differences between the tonearms, rather than accurately determine absolute frequency responses for the individual cartridge/tonearm systems. We were therefore free to use almost any post-cartridge signal-processing devices as long as they could be considered linear systems for pure tones (similarly, the accuracy of the test record didn’t make much difference since the same record was used for both arms).

Frequency-response measurements were made for each cartridge/tonearm system using the 30 spot frequencies of the CBS STR100 test record. The signal was amplified with the SP10 preamplifier’s right channel and a Hewlett-Packard 450A amplifier, then measured with a Fluke digital voltmeter. Although the frequency responses of the SP10 and the 450A are not important for relative measurements, it is worth noting that the SP10 is specified as conforming to the RIAA standard within 0.25dB; the measured response of the 450A was flat for audio frequencies.

The top and bottom panels of fig.1 show the

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**TABLE 2**

<table>
<thead>
<tr>
<th>Music for which one arm was chosen by more than four points (Fig. 2)</th>
<th>Arm preferred</th>
<th>Quoted comments about why arm was preferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bach cantata BWV2 Ach Gott von Himmel sehn darin</td>
<td>Graham</td>
<td>Clearer; more lively; voice powerful; violin more baroque.</td>
</tr>
<tr>
<td>Handel Cantata Ariodante</td>
<td>ET 2</td>
<td>More natural; less bright; more voice presence.</td>
</tr>
<tr>
<td>Handel Messiah</td>
<td>Graham</td>
<td>Brighter; cleaner; purer voice.</td>
</tr>
<tr>
<td>Mozart Flute Quartet K. 285 Allegro</td>
<td>Graham</td>
<td>Voice cleaner; voice ‘there’.</td>
</tr>
<tr>
<td>Praxtonus 6 Daenitez La Bourse</td>
<td>Graham</td>
<td>More alive and accurate: flute solid with surrounding air.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clear; bright; brighter top end and more natural.</td>
</tr>
</tbody>
</table>

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left- and right-channel responses for each cartridge/tonearm/SP10/450A system, plotted as a deviation from the ideal RIAA equalization. The difference between the left and right channels is largely attributable to the cartridge (the difference is similar for both tonearms).

The curves show that the Alpha-2/ET/SP10/450A combination comes very close to the ideal frequency response, except at very high frequencies. Using the Graham arm, the deep bass is boosted about 1dB and the highest frequencies are attenuated by 1-2dB. In most of the audio band, both tonearms produce indistinguishable, excellent results. Neither curve would be anything to brag about in a CD player, but both are a lot nicer looking than any concert-hall seat response.

The small differences in frequency response attributable to the tonearms are counter to what we would have predicted from the listeners’ comments. Although the Graham arm was judged richer, it offers no more bass and midrange energy, and slightly less deep bass, than the Graham arm. These curves should inspire caution when looking at cartridge frequency-response measurements, since differences of as much as 3.2dB (at 20kHz) were obtained just by moving the cartridge from one tonearm to another.

We attempted to find the low-frequency resonance of both systems by using the arm-cartridge resonance test on the Shure TTR1 test record (low spot frequency tones). Undesirable resonance would be manifested by a sharp peak, but both curves show a gradual rise and gentle leveling-off at 11Hz, thus demonstrating close to ideal behavior.

These measurements (fig.2) show that both cartridge/tonearm systems exhibit excellent frequency response without any obvious resonance problems, with the ET arm close to ideal RIAA when equalized with our SP10. We cannot find any clue as to why the listeners subjectively preferred the Graham arm or why
Natural Sound.
they found that arm brighter and more lively. It is possible that a test with more finely spaced spot frequencies, a very slow sweep, or other waveforms, would be more revealing.

A frequency response is not a complete characterization of a system, unless it is linear and time-invariant (Greenspun, 1986). Since a tonearm is a mechanical contraption, we suspect testing with squarewaves or specially warped records would be more fruitful than pursuing the frequency-response path.

Conclusions
Our admittedly not-that-probing objective measurements failed to explain the subjective listening results, and would not have predicted the solid subjective preference for the Graham arm in blind testing. Blind subjective listening tests will be necessary for evaluating tonearms until someone can come up with an objective measurement well-correlated with sound quality.

It is important to keep in mind that the test we performed cannot provide a definitive answer to the question “Which tonearm is better?” It can provide an adequate answer to the question “Which tonearm, when installed in an audio system, sounds better to a group of listeners?”

References


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Roger Modjeski\textsuperscript{1} examines why an amplifier's sound changes when you change the tubes

Over the years it has been noted by many astute listeners that changing tubes often produces a marked change in the sound of their equipment. While these changes are often attributed to the tubes alone, it is almost always a case of tube and unit interaction. It is incorrect, therefore, to say that a certain tube always sounds a certain way. In this article, based on information gathered over my last 25 years of working with tubes and tube circuits, and visiting tube manufacturers, we shall look at the ways in which tubes affect the equipment they drive.

First let us look at some of the problems involved in making tubes. Given a batch of tubes from any factory, there will be a spread of parameters. Each maker's noise, microphonics, gain, and operating point will fall into a bell curve due to the nature of the machines that make the tubes, the materials for the batch, and control over processes. A bell curve of gain is a good example (fig.1).

In an ideal world, all the 6DJ8 makers would adjust their grid lathes to get the same target value of 30 for the voltage gain (mu). In the real world, they actually try, but they have a specification of ±1, ±2, or ±3, depending on how important this parameter is to them. It is very hard to wind that little 6DJ8 frame grid to get a mu of 30 ±1. I encourage you to break open an old 6DJ8, pull off the top mica, cut the lower supports, and carefully pull out the two posts (about 3/8" apart) on either side of the central hollow cathode sleeve. Look at the fineness of the grid wire wound on the posts, and the spacing of those hundreds of turns. The mu of 30, which we want to control to ±3%, is the ratio of the diameter of that invisibly fine wire to the spacing between the turns. It's amazing they can do it at all! Tear apart a 12AX7 and you will see how much easier it is to wind its grid.

Controlling gain by mu alone is not sufficient, as mu is the product of transconductance (gm) and plate resistance (Rp). Although most triode circuits are designed to let mu predominate, sometimes gm is more in control of circuit operation. This is typical in cascode circuits, with their opportunities for larger variations: two tubes with the same mu may not have the same gm, as Rp will differ.

Now add in the variation in operating point (bias), and it is easy to see why different makers' tubes sound different—even to the point of not functioning in some overly sensitive circuits. An extreme case of this is the 12AX7 used in the NYAI Moscode Minuet-in-A. Designer George Kaye and I found that

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while the Tungsram 12AX7 worked well in the front end of his unit, the smooth-plate Telefunken did not. The latter tube caused the gain to fall 10-20dB, and the distortion to increase 10-100 times. Any user discovering this in his home would certainly hear startling differences between Tungsram and Telefunken 12AX7's. But the main thing he would hear is the difference between a functioning preamp and a malfunctioning one!

A less dramatic situation is found in feedback-type RIAA phono circuits; these include preamplifiers from Audio Research, Audible Illusions, and others. The problem stems from the fact that there is not enough loop gain for the feedback to provide consistent equalization at low frequencies. This means that the shape of the low end, and the low-to-high tonal balance, will vary with the mu of the tubes. I can remember magazines in the late '70s encouraging tube-preamp manufacturers to get their RIAA EQ accurate to some 10 milliBels! It is impossible to get ±0.1dB when tube variations can cause ±2dB errors. I believe this RIAA EQ shift to be the major effect one hears when changing phono tubes in active RIAA circuits. Fortunately, passive EQ circuits are free from this effect, and therefore RIAA-consistent over tube life.

Moving on to noise, there are four areas to look into. AC hum is rarely a problem these days, as most designers use DC-regulated filament supplies. But for those with some ripple, the filament construction becomes a factor. The 6DJ8 and 12AX7 are made with folded or coiled filaments depending on the maker—it is not part of the specification. A coiled filament will cancel hum, while a folded one will not.

Thermal noise, however, is the big battle. All tubes have thermal noise; in a perfectly made tube there will be only the thermal noise, which cannot be improved upon. (By the way, a 6DJ8 has a signal/noise ratio 8dB better than a 12AX7—no wonder it is the tube of choice for phono inputs.) In addition to this thermal noise, there is excess noise, which can be large—this is the noise we grade for. A RAM "A"-grade tube has only 3dB excess noise.

After listening to and measuring noise over the years, I determined that two tubes could measure the same total noise, but one would be more annoying than another. I designed a device to quantify the annoyance factor in the noise; that became the RAM factor.

The last area of noise performance is susceptibility to microphony—we all know the sound emitted by the speakers when a tube or chassis is tapped. The audio signal is caused by the relative motion of grid and cathode. Many tubes use all sorts of fancy mica insulations to hold things steady, but large variations occur from tube to tube and between makers. Low microphony is important to imaging and detail, in that a microphonic tube will receive sound from the speakers and put it back in the chain in a very non-musical way.

I am often asked if X tube is bright or Y tube is bloated, etc. This article is the answer to that question. I cannot ascribe a particular sonic quality to a particular tube because tubes in themselves do not have a sound.
The true audio connoisseur is possessed of extraordinary sensibilities regarding his or her music reproduction system. From speaker to cartridge, anything that delivers less than absolute accuracy is disappointing. Naturally, these sensibilities extend to the purchase source as well.

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Alvin Gold

Harry Pearson's disingenuous tirade in support of ethical reviewing in *The Absolute Sound* (Issue 47, p.26) forces me to defend one of my best enemies, namely Ken Kessler. I already have an axe to grind with HP, who once gave Martin Colloms the "Alvin Gold award for perceptive reviewing." It seems I had reviewed the Syrinx PU3, using a Koetsu Black and ascribed it to certain properties, to wit a slow bass and treble, which HP says properly belong to the cartridge (*Hi-Fi Answers*, Vol.9 No.34, p.68). Only one inconvenient detail gets in the way of this plausible story: the facts. I had never said anything of the sort, for the simple reason that I had never so much as set hands—let alone eyes—on the arm in question.

Well, mistakes happen, and that didn't bother me much. What did bother me was that HP chose not to print my letter pointing out these facts (the letter was acknowledged by *TAS*, by the way). Up to that point I had taken the magazine's assertions that it was whiter than white as a simple statement of fact. More recently, Keith Howard (editor, *HFA*) wrote a letter refuting HP's charges of lack of integrity, and this too was never published, though some secondary points made in that letter are referred to obliquely in Issue 48 (p.40). I'm beginning to wonder if HP's protestations aren't an itsy-bitsy *soupcon* self-serving.

For all that, compared to the usual standards of US mainstream magazines, *TAS* clearly shines out like a shaft of gold. What I do accuse him of is naivete, especially in the way he has allowed himself to be used by an evidently embittered Reg Williamson (see "Beating Our Gothic Breasts," *TAS* Issue 47, p.26). In the process he has sought to impugn the integrity of two magazines, *Hi-Fi Answers* and *Hi-Fi News*, and a reviewer, Ken Kessler.

I'm not in a position to say much about the two magazines; after all, I write on a freelance basis for both, and what I say could easily be misinterpreted. As a simple statement of fact, however, I know that no clash of interest occurs as far as *HFA*’s Accessories Club is concerned. The club never earned or was designed to earn *HFA* any real money—certainly not more than the costs involved in running it. I can also say that as a major *HFA* contributor, I have never been given or even lent any of the accessories, or been invited to comment on them in any form. In the case of the latest project, the kit amplifier, when bought through the club (as most of them will be), not one penny goes to *HFA* at all. This, remember, is the club's most ambitious project yet, and is not available through other sources.

By the way, the basis on which the club operates has now changed to a discount voucher scheme; all orders being sent directly to the manufacturer or his agent and not through *HFA* either. I don't know exactly on what basis *HFN/RR*’s accessory club operates (I've never asked), but again I've never been asked to write about them.

On a more general tack, I believe that the editorial integrity of the magazines in question is self-evident to any informed reader, and that further comment is superfluous. You're free to draw your own conclusions. Ken Kessler, however, is a different story. It so happens I remember Ken from just before he took to reviewing. I remember reacting very strongly to him at the time; I regarded him as doctrinaire and egotistical (I hate to think what he thought of me), though I have since moderated my views as I have come to know him better. As one of my colleagues once said, what he lacks is an off switch. Over the last few years Ken and I have joined battle on a number of issues, and I think of him as fundamentally misinformed on subjects ranging from music to tube amplification. On the other hand I have a great deal of respect (tinged with jealousy) for KK's enormous talent as a writer, and I have to concede he has always been able to make a wonderfully cogent case to support what he says.

The point I am trying to make, of course, is that where Ken is concerned, my only reason for defending him is that I believe an injustice has been done. It's only fair to point out too that since he joined *HFN/RR*, Ken has caused an enormous reaction among the magazine's still predominantly ultra-conservative reader-

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ship, who have accused him of just about every kind of journalistic vandalism imaginable. Until now, though, nobody I know has ever accused Ken of being unethical. If you met him you wouldn't doubt either his dedication or his sincerity. Whatever else he is, he is not dishonest. It could be argued that he is too opinionated to be led by the nose, and like most writers he's far too broke to be on the take. I concede that it doesn't look good for his name to have been printed in the advertisement in question, and I know that he had no inkling until it was too late that this was to be. For this the dealer who wrote the ad should be held responsible, along, perhaps (as HP implies), with the advertising staff of HFN/RR. Reviewers don't represent specific products on a paid or unpaid basis in the UK. If they did they would rightly be held up to ridicule. No, HP's complaint is a real one all right, but it is aimed at the wrong target.

The reality behind Reg Williamson's atavistic assertions is worth investigating. Reg belongs to a generation whose ordered view of audio matters has been poorly represented of late. This view is often called the objectivist one, but I have come to think of it as the Newtonian model; it includes among its propositions (picked at random) that flatness of amplitude responses defines the worth of loudspeakers, that distortion is academic below about 0.1% and all-important above, and that compact disc is perfect. The non-mechanistic or relativistic world view was first propounded in a truly convincing way by Hi-Fi Answers when Paul Benson was editor and grew from there. Until John Atkinson succeeded as editor, Hi-Fi News (along with Gramophone) was the last bastion of the Newtonian view. Under the new order, the rigid correspondence between the mostly static phenomena that B&K equipment was capable of quantifying and the sonic performance of high-fidelity equipment was irrevocably broken.

Under the new regimen, which has proved vigorous and powerful, the reader of magazines was at last let in on the fact that we know a damn sight less than we thought we knew about how high fidelity works. The old "measure it to find out how it sounds" school was thoroughly discredited. Judging by the numbers alone was never scientific, even if a certain amount of scientific methodology was used. It was merely repeatable—repeatably wrong every time. The measurement people failed to predict that CD players were not perfect, that apparently similar amplifiers could sound different, or that a $100 belt-drive turntable could sound better than $1000's worth of direct-drive turntables. Indeed, they actively fought against such ideas.

Crucially, they also failed to properly explore the correlation between the numbers they were producing and the brain's perception of sound. Perhaps this was the key shortcoming of the old Newtonian viewpoint, since it is obvious that unless the correlation is well understood and documented, the whole ruddy edifice falls down around their ears. Which it did. But the old school of reviewers and designers clung stubbornly to the facts as they measured them, ignoring totally what they heard if it happened to contradict what they measured.

The change in reviewing styles from the Newtonian to the relativistic (to stick with this flawed analogy) totally traumatized the industry, and left us with a legacy of acrimony and sometimes willful misunderstanding. I would suggest that this revolution—it was nothing less—was the UK's greatest contribution to the audio world, before or since, and far more important than any specific product or products. My reading of the situation is that the same thing has happened in the US, but in a much more fragmented way, as befits the much grander scale of the industry involved. The whole process also appears to have started much later, and is clearly still going on. In Britain, on the other hand, it is all but complete, but the latent bitterness between old and new schools boils over at times, mostly at AES meetings and in the letters pages of HFN/RR (JA used to encourage it by throwing all the letters of praise in the bin). I believe that this history informs the views that Reg Williamson (and certain others) propounded.

In recounting the above, I have nailed my colors pretty firmly to the mast of the second camp, the one that says that compact disc doesn't necessarily sound perfect. More than this, it was the inherent intellectual dishonesty (as I saw it) of the Newtonian viewpoint that fired my enthusiasm to write for high-fidelity magazines in the first place and has continued to do so since. (That, and the promise of being able to listen to music and get paid for the privilege.) If HP wants to look for an area
where ethical standards were distinctly dodgy. I know that it was fairly widespread about, say, ten years ago. On the whole, and with certain glaring exceptions, there is genuinely very little to complain of now. To say, as Reg did in his letter, that "no one raises an eyebrow" at the "hypocrisy and fractured ethics" endemic to the industry, is purist shit of the first order.

I have never tried to hide my contempt for the crummy science conducted by crummy scientists that characterized the reviewing industry until a few years ago, but I freely accept that the new order isn't whiter than white either. Although I've refuted charges of unethical behavior, especially in most of the mainstream publications (note the qualification), I cannot refute certain other charges.

Since the change in the order of things, there has been a fairly widespread idea that measurements are totally irrelevant to the investigation of good sound reproduction, and this is clearly throwing out the baby with the bathwater. What we need is not less science, but decent science. I have also to concede that the professionalism and standards of rigor of a number of reviewers is very much open to question. Reviewing based on assessing musical performance deserves just as much care and attention to methodology as does measuring on the test bench. It is every bit as objective a task, where it could be argued that trying to tie measurements to perceived phenomena is a subjective one.

Bad measurement technique is summed up for me by one infamous test (this was long ago, so no names) in which a group of tonearms was assessed for audio quality by performing a spectrum analysis of energy present at the stationary point just above the main bearings (!) using another cartridge as a transducer. Aside from the fact that it is virtually impossible to say anything useful about what happens at the stylus by measuring what happens 9° away at the tethered end of the arm, I need only say that where the measurement stylus sometimes rested on structural parts, viz the bearing housings with some arms, in others it simply rested on a piece of trim with indeterminate structural properties. Generalizing from the particular, I conclude that the pendulum may have swung too far, and that some kind of rapprochement is needed between the forces of darkness and those of light.
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CLASS K: "Keep your eye on this product." Class K is for components which we have not tested (or have not finished testing), but which we have reason to believe may be excellent performers. We are not actually recommending these components, only suggesting you take a listen.
Components listed here are ones which we have found to be among the best available in each of four quality classes—the ones whose purchase we most highly recommend. Following each listing is a brief description of the product's sonic characteristics and a code indicating the magazine Volume and Issue in which that product's report appeared. Some products listed have not yet been reported on; these are marked (NR). We recommend that any product's entire review be read before purchase is seriously contemplated; many salient characteristics, peculiarities, and caveats appear in reviews, but not here.

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

Some of the listed items are discontinued models (†), retained in this list because their durability and performance distinguish them as "classics," and because they sometimes may be obtained for substantially less than their original cost. (Upgrade modifications are available for many.) In general, however, discontinuation of a model will preclude its appearance here. In addition, though professional components—recorders, amplifiers, monitor speaker systems—can be obtained secondhand and can sometimes offer performance which would otherwise guarantee their inclusion, Stereophile's "Recommended Components" listing is exclusively concerned with products obtained through the usual hi-fi retail outlets.

How to read the listings

"Recommended Components" in Stereophile is a noble tradition which has evolved drastically from the time when JGH published two lists: a list of components, with a series of obscure numbers after them; and a list of numbers, with a definition of what each number meant. Definitions such as "very 'gutsy,' authoritarian sound (think how Zarathustra must have spoken)," and "we don't really like this, but a lot of people whose judgment we respect do," were not uncommon. The listing in those days had two advantages: non-members of Mensa couldn't read it at all, so we didn't get too many letters in response; and it succinctly expressed the preferences of one man, J. Gordon Holt. If your preamplifier wasn't included, you could always blame it on JGH's idiosyncratic preferences.

Nowadays, "Recommended Components" is a very different beast; we try to include any product which is truly excellent or which we feel represents good value for money. Many different tastes are represented. There are seven amplifiers in Class A alone, while in the days when JGH alone composed this feature there were seven recommended in all four Classes together. The nearest analogy to our Class A amplifier ratings is a good wine store's recommendations on California Chardonnays at less than $20 a bottle: there are at least 12 or 15 you shouldn't miss, and who's to say which will be the best with a particular meal?

Of course, Class A amplifiers (which are only a case in point—the problem exists throughout the list) don't cost $20 each—$4000-plus is more like it. And, in spite of our oft-repeated advice to try them at home, most dealers won't lend you $12,000-$20,000 worth of merchandise to play around with. You'll have to read carefully: our descriptions here, the original reviews, and (heaven forbid) reviews in other magazines to try to determine which group of amplifiers to choose from. Carefully evaluate your room, your tastes, your source material and front end(s), your speakers, and you: with luck, you may be able to come up with an intelligent selection. "Recommended Components" will not tell you just what to buy!

Nor are we terribly sympathetic to letters complaining that the Symphonic Bombast A-123, which we recommended heartily two years ago, no longer makes it into Recommended Components at all. Where deletions are made, we strive mightily to give reasons (there always are reasons). But remember, deletion of a component from this list does not invalidate a buying decision you have made. In every case, you, the audiophile in charge, are expected to independently evaluate the performance and suitability of the product for your situation. Caveat emptor.

Stereophile, November 1987
Turntables

Editor's note: Any of the four Class A turntables and their variants will provide a musically satisfying basis for a top system. It is not usually worth changing one for another unless the listener is confident that the rest of his system will be thereby improved. If contemplating purchase of one of these Class A units, an in-depth audition as part of a preferred turntable/arm/cartridge combination is mandatory. A possible sixth contender is almost certainly one of the Goldmums, but these have not been auditioned for some time. If an inexpensive turntable has not made its way into Class C, D, or K, assume that it is not recommended under any circumstances. Underachievers are more common in the world of turntables than in any other area of Hi-Fi.

A

Linn Sondek LP12
The standard against which newer turntable designs have been measured for 13 years now, the Linn is more colored than the other Class A 'tables (particularly in the upper bass), harder to set up, and more likely to go out of adjustment, though much better now in this respect than it used to be (low-bass extension suffers when the LP12 is not set up correctly). Latest version has a new laminated armboard which, with Zener mods to the Valhalla board, results in a considerably more neutral sound. (Vol.7 No.2)

RATA Torlyte-modified Linn Sondek
Russ Andrews' drastic modification for the Linn alleviates the lack of transparency in the upper bass, rendering it more compatible with such tonearms as the SME V. The Linn guarantee will be voided, however. (Vol.10 No.3)

Oracle Delphi II
Setting the standard for elegant appearance, the Oracle also works superbly, giving up some bass extension to the VPI and SOTAs. If appearance matters at all to you, give the Oracle a listen. (Vol.9 No.4)

SOTA Star Sapphire Series III
The Series III, complete with the acrylic Supermat, is significantly better than earlier versions, due to its use of an aluminum armboard, new motor drive pulley, new suspension springs, and ribbed platter construction. Compared with the standard SOTA Sapphire, the vacuum holdown significantly improves bass range and detail, as well as resolution across the audio range. The SOTA "Electronic Flywheel" line conditioner improves performance very slightly further. (Vol.10 No.5)

SOTA Sapphire Series III
The standard SOTA (now also in Series III guise) lacks vacuum disc clamping but is easy to set up and use, attractive, ingenious in design, and sonically excellent. With the new Supermat it comes close to its much more expensive brother, the Star Sapphire, in sonic neutrality, midrange naturalness, and high-end sweetness. Vacuum clamping is available as a $695 upgrade. (Vol.10 No.5)

VPI HW-19 II
The latest VPI has achieved a standard of sonic neutrality that puts it very close to the latest SOTA Star Sapphire, and at a much lower price. It is cosmetically less elegant, and a bit morecumbersome to adjust, but it readily accommodates a wide range of tonearms and is very stable. The $300 Power Line Conditioner is a worthwhile accessory. (Vol.9 Nos.4 & 5)

B

Acoustic Research Connoisseur ES-1
This is one low-cost turntable we can heartily recommend. Compared with the original AR, it has much better cosmetics, comes with its own arm or can be fitted with yours—the Cheapskate just loves the AR with the Rega RB300—but seems to have a less effective suspension than the original. Intrinsic character is a bit fat in the upper bass, but is musical, nevertheless. Can produce hum problems with unshielded cartridge like the Grados. (Vol.8 No.7)

Linn Axis
Versatile, competitively priced, "turnkey operation," two-speed belt-drive deck with electronic speed control and ingenious suspension. "Smaller" sound than the Sondek, perhaps limited by the good, but not outstanding, performance of fitted LVX Plus tonearm. (Vol.10 No.1)

Sonographe SG3
Better-sounding than the AR and a bit more expensive, the Sonographe may be hard to find, but is worth seeking out. Good value in the unarmed version. (Vol.9 No.7)

C

Acoustic Research EB-101
Almost as good as the Connoisseur, but comes fitted with what can be described as a no-more-than-adequate tonearm. (Vol.8 No.7, Vol.9 No.4)

Dual CS-5000
Sophisticated budget 'table with electronic speed control. Has an OK arm and a basically good sound (apart from a lightweight bass) for a moderate $350. The 5000 also has automatic armlift at end of record, the only such 'table we recommend. A Cheapskate favorite. (Vol.9 No.4)

Harman/Kardon T-65
Good basic performance, marred by tonearm problems. Perhaps not quite as good as the other "C" rated decks, but a clear notch above the Dual 505-2. The lack of an interchangeable tonearm and 50-so suspension are drawbacks. On the plus side, the T-65 is easy to set up and use, and doesn't tend to go out of adjustment with time or if moved. This deck offers about the minimum level of performance which can legitimately be described as audiophile quality. Recommended only if bought at discounted price. (Vol.9 No.2)

Rega Planar 3
Synergistic mix of no-nonsense deck with superb arm. Lack of environmental isolation may be problematic; some recent reports of variable wow & flutter; limited cartridge compatibility; but a safe recommendation, nevertheless. (Vol.7 No.1, Vol.8 No.6)

D

Dual CS505-2 phono unit
Getting down to the least you can expect to pay for a record player that works at all well, the Dual 505-2 has been forced (by demanding British audiophiles) to perform—for $200. It has its problems—read the
review for details—but you can’t do better without spending more than $300. (Vol. 8 No. 3)

K
Alphason Sonata, Audiomeca JL, Roksan Xerxes, Dunlop Systemdek, Elite Rock, Heybrook HB2, Merrill, Michell Glyrodek, Revolver Mk II, Pink Triangle P-TOO, The Source, The Well-Tempered Turntable, Versa Dynamics, Goldmund Reference

**Tonearms**

**A**

**SME Series V**
Extraordinarily neutral pivoted tonearm, with the lowest resonant signature of any. Easy to set up, VTA and overhang are adjustable during play, but no azimuth adjustment. The best bass performance on the market. Very pricey, but ergonomically and aesthetically a work of art. A finish worthy of Tiffany’s, according to AHC. Some compatibility problems with cartridges having low height, but otherwise the new reference. Probably the best arm available today. A new, less versatile version, the IV, appears to offer much of the V’s sonic virtues at a lower cost. (Vol. 9 No. 6)

**Eminent Technology Two**
The ET Two corrects its predecessor’s cueing difficulties and comes up with a host of ingenious extras, including VTA adjustable during play, but more important, it has “an extraordinarily live and open soundstage” and gets the best results from a wide range of cartridges. Needs a very stable subchassis to give its best. Fussy to set up and use—some people won’t want to bother. Surpassed overall by the SME V, which has as neutral a midrange and significantly better bass definition and extension. At less than half that fixed-pivot arm’s price, however, the ET Two is excellent value. (Vol. 8 No. 7)

**B**

**Alphason HR-100S**
Neutral, very low friction. An advantage is the availability of different tonearm tube and counterweight inserts to vary the effective mass, and thus enable matching of virtually all medium- to low-compliance cartridges (even some moderately high-compliance ones). (Vol. 7 No. 3, Vol. 8 No. 7)

**Linn Ittok LV7**
Slight resonant colorations in the upper midrange compared with the best arms, which can add both hardness and a false sense of “excitement.” Bass and lower midrange still among the best, however, and superior to the similarly priced competition in these areas. (Vol. 8 No. 7)

**Souther Triquartz**
The latest version of the Souther SLA-3 shows obvious signs of refinement. The whole arm is less resonant, the sound more solid. AHC feels it to be a close call rating the Eminent Technology a class higher—the Souther is very close to Class A. Possesses a more “live” sound than the ET, and works better with high-compliance, low-mass moving-magnet cartridges, and, of course, very well with the ClearAudio Veritas (imported by Souther). Souther now supplies a modification to overcome rumble problems due to the turntable spindle having to act as an additional bearing (see Vol. 10. No. 6, p. 153). (Vol. 8 Nos. 5 & 7)

**Sumiko FTIII**
Solid sonic value for money, audibly superior to the MMT, though finish is a bit rough compared with the best. VTA adjustable during play. (Vol. 9 No. 4)

**The Well-Tempered Arm**
One of the most neutral arms available, this odd-looking arm is hard to fault on any count. Superb highs, stereo soundstaging and midrange, excellent compatibility with MC cartridges that put a lot of energy back into the arm. Some deficiency/softness in the low bass, but above that are virtually no problems. Good value for money. (Vol. 8 Nos. 4 & 7, Vol. 9 Nos. 3 & 5)

**C**

**Alphason Xenon**
Very similar to the HR-100S, but cheaper bearings and internal wiring downgrade the sound by 5% and knock $300 off the price. (Vol. 8 No. 7)

**Rega RB300**
At $195, the Rega offers very good detail, depth, midrange neutrality, ambience, and precision of imaging, almost creeping into Class B. Works well with the Rega ‘table, but also recommended by Audio Critical as an ideal substitute for the arms that come with the AR and Sonographe ‘tables. Lacks any form of height adjustment, however: VTA can only be adjusted by adding spacers under the base. Even-cheaper RB250 dispenses with the spring downforce adjustment and the sintered tungsten counterweight, but sacrifices little in sound quality. (Vol. 7 No. 7, Vol. 10 No. 1)

**Sumiko MMT Revised**
A simple, removable-headshell arm that is less than the best but not by that much. Well-suited to either MM or MC cartridges. (Vol. 8 No. 5)

**K**

**Air Tangent, SME IV, Wheaton Triplanar**

**Deletions**
Sumiko’s “The Arm” used to be the pivoting arm against which others were measured, but is no longer manufactured. Should be a worthwhile secondhand buy from owners who are upgrading to the SME V. Grado Signature no longer produced, yet to be replaced.

**Cartridges**

**A**

**Koetsu Red Signature**
If the Ortofonos and van den Huls appeal to the brain, then the Koetsu appeals to the heart. Romantic sound despite neutral tonal balance: “a cartridge for music freaks rather than detail lovers.” The Red’s soundstage is superbly delineated; the Signature is the champion in this area. (Vol. 8 No. 7, Vol. 10 No. 5)

**Linn Troika**
Lightish balance, but musical integrity not compromised by superb retrieval of information. As good as the Koetsu Red at the presentation of the soundstage. Unique three-point fixing maximizes mechanical integrity but means that it can only be easily used in
the Ittok tonearm. (Vol.10 No.6)

**Monster Alpha Genesis 1000**

As sweet in the top five octaves as the Koetsu Red Signature but more detailed, in the same league as the Virtuoso DTI. The best cartridge Monster Cable has produced. (Vol.10 No.5)

**Ortofon MC-2000**

The MC-2000 can make most good discs sound very much like their CD counterparts. Superb trackability, very good soundstaging and imaging, excellent bass, extremely smooth highs, but such a low output (0.05mV!) that hum and noise will be a problem in many systems. A very low noise step-up is necessary. (Vol.8 Nos.2, 4 & 7)

**Sumiko Virtuoso DTI**

The first high-output 'coil to make Class A. Warmer balance than the Balsam, with first-rate imaging and excellent harmonic contrast. The champ when it comes to retrieval of HF detail, but a top end that is free from the problems that plague most MCs. According to SWW, it has the "uncanny ability to reproduce the natural weight and authority of live music." vdH stylus requires careful setup; output a little on the low side for some MM inputs. Somewhat forward balance, but up with the best in terms of transparency. The music emerges from a near-silent background that is akin to CD. (Vol.9 No.4, Vol.10 No.5)

**van den Hul MC One**

Not particularly cable fussy, but does require attention to arm damping. Works very well in the WTA and the SME. Carries the vdH MC-10's resolution of soundstaging, tonal neutrality and naturalness of timbre a stage further to compete with the best. Bass a little slow, perhaps. (Vol.9 No.8, Vol.10 No.5)

**B**

**ClearAudio Veritas**

The Veritas has amazing resolution and definition, superb dynamics, excellent bass, exceptional imaging and depth, very sweet highs, but is not natural-sounding enough to make it into Class A. A special version and a headshell-mounted RIAA amplifier are available for the Souther tonearm. (Vol.8 Nos.4, 5 & 7, Vol.10 No.5)

**The Decca cartridges**

The Deccas are perhaps not competitive in these days of rapid cartridge development, but many perfectionists still have a love-hate relationship with these moving-iron cartridges. They combine superb sound —low-frequency dynamics are perhaps the best around—with shoddy construction, somewhat "frazzled" highs in standard trim, and a propensity for causing incurable hum. (Based on a sum-and-difference sensing circuit, the channels share a ground.) The van den Hul Decca has very good trackability, sweet (tapelike) highs, excellent speed and detail, and very dynamic and lifelike sound. "One of the most seductive cartridges on the market." (Vol.7 Nos.4, 5 & 8). The Garrott Decca (Vol.7 No.8, Vol.8 Nos.1 & 3, Vol.10 No.5) is slightly superior in every way to the van den Hul. The Super Gold, which is actually marketed by Decca, is similar to the Garrott but is both a little more forward-sounding and colored, as well as suffering from inadequate quality control. (Vol.8 No.4, Vol.10 No.5)

**Grado Signature MCX**

The only MM cartridge to make it into Class B. Superbly natural midrange, coupled with smooth, extended highs. Soundstaging and imaging very good, but not up to the standard set by the top moving-coils. (Vol.10 No.5)

**HiPhonik MC-R5**

"One of the best MCs I've tested" said JGH about this $400 cartridge, referring in particular both to tracking ability and to the breadth and depth of its soundstage. Its euphonic balance would suit speakers with an uplifted HF balance, such as the Martin-Logan Monolith and CLS. (Vol.9 No.8)

**Koetsu Black Goldline**

A lack of life keeps this classic from Class A status, but low frequencies are among the best available. Warm balance is not particularly neutral, but is musical. (Vol.10 No.5)

**Linn Karma**

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

**Monster Alpha 2**

Smooth, musical, good bass and soundstaging, very quick and detailed, but lifted high end can make choice of ancillary equipment important. "More agreeable than accurate," said JGH, due to the Alpha 2's recessed midrange, but he did feel that the soundstaging, imaging, separation and trackability were all superb. Not at its best with Conrad-Johnson or Kreil preamps, or Martin-Logan loudspeakers. Samples may vary; ours did (though one of them had become magnetized). (Vol.7 No.8, Vol.8 Nos.1 & 3, Vol.9 No.4, Vol.10 No.5)

**Ortofon MC-30 Super**

Much less expensive derivative of the MC-2000 features almost Class A performance in some areas, particularly regarding bass performance and tracking, but less good soundstaging. Slightly less neutral tonal balance then the '2000, being a little bright and forward, will render it incompatible with systems optimized for CD playback. (Vol.10 Nos.1 & 5)

**Signet MK-440ML**

The Signet stands out as the only cartridge JGH has found with sonic accuracy comparable to the Ortofon MC-2000, and at much lower cost ($600). Its neutral (rather than laid-back) upper midrange is not like most MCs, and its strength is accuracy rather than euphony. A very good, not excellent, tracker best used with a low- to medium-mass arm.

**van den Hul MC-10**

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

C

**A&R P77Mg**

Polite, sweet sound and a neutral tonal balance, but a little undernourished, dynamically. Will work wonders in a an otherwise brash-balanced system. (Vol.10 No.4)
Adcom SXC/van den Hul
"Sound like a good dub of the master tape," said AHC, but lacks too much detail to make into Class B. (Vol.10 No.5)

Adcom XC/Microridge II
Very smooth and neutral, much like master tape, with excellent trackability. Highs perhaps a little sweeter than more expensive vdf4 version. Excellent value for money. (Vol.7 No.8, Vol.10 No.5)

Audioquest B-100L
Remarkably accurate balance and timbre, good soundstaging, subtly forward and elevated highs and upper midrange. (Vol.8 No.4)

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

Grado Signature 8 MX
As good a bass as the Siggie MCX, but less neutral midrange and less-detailed sound, despite stronger HF. (Vol.10 No.5)

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

MAS Econocoll
An extraordinary buy, this is fast, very smooth, and has very good trackability, good soundstaging and imaging, and a slightly laid-back quality. (Vol.7 No.8)

Nagaoka MP11 Boron
A clear, precise midrange and treble is allied to a rather veiled bass, but the mixture will work well in inexpensive systems where the need for unfauling highs outweighs the lack of low frequency clarity. (Vol.10 No.2) Less expensive MP11 Gold almost as good. (Vol.10 No.4)

Ortofon MC-20 Super
A wide but shallow soundstage and a somewhat exaggerated high end will mean careful attention to system matching. Like the new X3-MC, the MC-20 Super will do well in systems having a depressed top octave. (Vol.10 No.5)

Ortofon X3-MC
First in a new range of reasonably high-output MCs from Ortofon, the X3 features excellent tracking and portrayal of recorded space, with fine retrieval of groove information. In many ways the opposite in character to the Denon DL-160, the X3 will shine in systems that lack a little sparkle. (Vol.9 No.8, Vol.10 No.1)

Shure V15-V MR
Exceedingly neutral midrange and bass, slightly soft high end, high compliance. Excellent value at typical discounted price of $139. You sacrifice a bit of detail both compared with MCs and the more expensive ($400) Shure Ultra 500. A "budget reference," accord-

ing to both AHC and the Cheapskate. Recommended for its unsurpassed tracking ability, excellent reliability, and listenability. (Vol.7 Nos.5 & 8, Vol.10 No.5)

D

Goldring Epic (US version)
At last a challenger — albeit, at $60, a more expensive one — for the budget crown of the cheap Grados. Good tracking ability, and more extended HF response than the Epic sold in the UK (but less-good soundstaging), make it suitable for use in relatively expensive LP players until the budget can be stretched for a Class B or C cartridge. (Vol.10 No.1)

Grado XTE +1
The best buy in a really cheap cartridge, this $20 MM has excellent trackability and sounds rather like a good MC. When your friends need to change the cartridge on their old Dual or Garrard, this is the one to recommend. Will hum if used with AR decks; lack of suspension damping can lead to woofer pumping, even flutter, with high-mass arms. Dealers aren't in love with it; at $20, how much profit can there be? (Vol.7 No.8; actual review was of an earlier version, the GTE+1)

Nagaoka MP10
Rivals the cheap Grado as a bargain-hunter's dream. Lacks attack and detail, but sound well-integrated across the frequency band. (Vol.10 No.4)

Ortofon MC-10 Super
"Uncolored, detailed, and composed," said KK of this conventional-output MC, with a performance evenly balanced across the board. Sins of omission rather than commission lead to a recommendation, despite being a little expensive for Class D. (Vol.10 No.2)

Shure M105E
Excellent tracking and neutral sound compromised by rolled-off extreme HF octave, restricted soundstage and mechanically inadequate P-mount adaptor. Low frequencies tighter and better defined than the cheaper M104E, which lacks the flip-down damper. (Vol.10 No.4)

K
Carnegie, Ortofon MC-3000

Deletions

Compact Disc Players
Editor's Note: The class ratings are a little different for CD players: whereas the phrase "state of the art" can be interpreted literally for other categories, here it means the best CD sound available — as of the time we write this. We all urge caution to someone about to purchase an expensive "state-of-the-art" CD player. Such is the rate of progress that it will probably be superseded, or equalled at a lower price, in less than a year. And no matter how good a player is, it can't do anything about sonic problems on the discs. There are signs, however, that the latter are diminishing.

A
Accuphase DP-80/DC-81
At $8000, this beautifully constructed two-box CD
player is the most expensive on the market but is also 
the most listenable, according to LA and JA. Not quite 
as detailed or as good at resolving very low-level 
information as the Stax and a bit woolly in the bass, but 
always musical. (Vol.10 No.6)

**California Audio Labs Tempest Mk.II**

First commercial player to feature a tube analog stage, 
the Tempest is based on a Magnavox 2041 with ex-
tensive modifications. A typical "tube sound" in that 
it is a little bright without being hard, and has some 
mid bass fatness. Soundstage is detailed and deep. 
Highish output impedance dictates careful preamplifier 
choice, and the player won't drive long cables. Mk.II 
version incorporates Mike Moffat's digital circuitry and 
is one of the best players for classical music repro-
duction. Some doubt as to how long Philips will be 
able to supply the 14-bit, 4x oversampling circuitry and 
chassis. (Vol.9 No.6 & Vol.10 No.1, Mk.I; Vol.10 
No.5, Mk.II)

**Cambridge Audio CD1**

England's finest, a two-box 4x oversampling solid-
state player using three Philips 14-bit DACs per channel 
to obtain 16-bit resolution. The best-focused, most 
stable, and widest soundstage MC has heard, coupled 
with excellent dynamics. Offers a choice of low-pass 
filters to best match those used to make recording. 
By repute, suffers from a lack of QC and now very 
expensive; only available from two dealers in the US. 
(Vol.10 No.3)

**Stax CDP Quattro**

Offers filtered or direct (lacking analog low-pass fil-
tering) outputs; via the latter is the champ at informa-
tion retrieval. Can be a little unkind to already 
excessively bright recordings, but with appropriately 
high-quality systems, will give a sound that is both 
analytical and musical. (Vol.10 Nos.6 & 7)

**Denon DCD-3300**

"Remarkably smooth sound," noted JGH, but lack-
ing a little detail when compared with the Class A 
players. Of comparable subjective quality with the 
Sony '70s, is sweet where the other player is forward. 
(Vol.10 No.7)

**Kinergetics KCD-20A**

Some controversy over this player, due to its use of 
patented circuitry to cancel out the inherent errors 
in digital recording. A little lean in tonal balance, 
according to MC, perhaps a bit "solid-state," according 
to DO, but has superbly detailed midrange. High 
enough output to feed power amplifier direct. (Vol.10 
Nos.5 & 4)

**Meridian 207**

Significantly better than its predecessor, the PRO MCD, 
when auditioned via its fixed outputs, still uses Philips 
14-bit oversampling chip set. Has remote volume con-
trol, and can be used as a system preamplifier, lack-
ing only phone input. (Vol.10 No.3)

**Sonographe SD1**

Sweet highs and a lack of grain, but perhaps a slight 
loss of transient detail and resolution compared with 
the best. A consistently musical performance, bettered 
only by the best analog front ends, at an affordable 
price, hence a "best buy" rating. (Vol.10 Nos.1, 3, 4, 
& 7, Cheapskate)

**Sony CDP-705ES**

As good as the Sony CDP-650ES/DAS-705ES combi-
nation at half the price. Superb bass, both in terms 
of extension and definition, coupled with a Philps-
like resolution of detail. Probably the best Sony yet. 
(Vol.10 No.7)

**Discrete Technology LSI Mk.II**

Roughly comparable with the PS Audio CDIA in 
overall attainment, this modified Magnavox is warm-
balanced, but less good at retrieving recorded detail. 
(Vol.10 No.1)

**Mission PCM7000**

Fully loaded with features, the Mission is the best of 
the machines featuring Philips' 16-bit chip set. A tight, 
extended bass is coupled with a very clean but 
otherwise soft treble, rendering listenable CDs with 
a hitherto fatigueing balance. Resolution of low-level 
detail among the best in this class. JA loves the remote 
volume control. (Vol.10 Nos.2, 4, & 7)

**Nakamichi OMS 5 II**

Very much better than the first generation of Naka-
michi players, the '5 is a less-featured version of 
the identical-sounding OMS 7 II. Still a bit expensive 
for Class C but sounds open and lively, with excellent 
soundstaging. (Vol.10 No.4)

**Sony CDP-505ES**

The Cheapskate was knocked out by this new 4x over-
sampling player, the successor to the now obsolete 
CDP-55 which JGH recommended so highly in Vol.9 
No.6. Provisional Class C rating until a further sam-
ple reaches Santa Fe. (Vol.10 No.6, Cheapskate)

**Technics SL-P1200**

A sound that is easy to live with, and ergonomically 
one of the best with its "professional" styling and 
features. (Vol.10 No.4)

**Denon DCD-1500 II**

A best buy! (Vol.10 No.2)

**Euphonic Technology FD1040†**

A much modified Magnavox, but capable of excellent 
sound. If you have an old Magnavox, it may well be 
worth getting it modified rather than buying a whole 
new player. (Vol.9 No.7 Cheapskate)

**Magnavox CDB860**

Resolution could be better, and the sound is slightly 
hard, but at $200, excellent value for money and a 
safe buy. A "steal," according to the Cheapskate. 
(Vol.10 No.6)

**Audioquest, Melos, Accuphase DP-70**

**Deletions**

Moffat, due to almost zero availability. Sony CDP-
650ES/DAS-705ES combination, due to replacement 
by significantly less expensive Sony CDP-750ESD. 
Meridian PRO MCD, NEC CD-705, Magnavox FD-1040 
discontinued. PS Audio CDIA, due to lack of recent 
auditioning.

**Preamplifiers**

**A**

**Audio Research SP11**

A tube/FET hybrid that JGH finds both musical and
accurate. Inputs and controls for every possible need—except bass and treble—and sound improves even further if most of the switching and controls are bypassed via provisions on the preamp. Requires significant warmup for the best sound—even to the point of leaving it on all the time. (Vol.9 Nos.4 & 7)

Krell KR52
Less forward than the SP11, offers an exceptional amount of music, even with very low-output MCs. Line stage the most neutral AHC has heard. Overall, sets a new standard for transparency. (Vol.10 No.4)

Threshold FET 10
Two-box solid-state preamplifier—phono and line stages available separately—with separate power supplies. Not quite as seductive as the SP11, according to JGH, and not quite as much image depth, but astonishingly transparent and capable of intensely musical sound. (Vol.10 No.6)

B
Audio Research SP10 II
This versatile all-tube preamp is virtually free of coloration, doing everything almost perfectly—"almost" being the word distinguishing it from the SP11, whose low bass is less fat and which has better detail. Only practical limitation is its inability to use very-low-output cartridges such as the Ortofon MC2000, without additional gain devices. JA's reference, but AHC finds its virtues to be too good to be true, feeling the SP11, in being more transparent to the details of the recording, offers more accuracy, if not always more musical sound. (Vol.7 No.7, Vol.9 No.7)

Conrad-Johnson Premier Three
Another state-of-the-art tube preamp, the Premier Three is similar in overall quality to the SP10 II but more "tubey"; a little warmer, more luscious midrange, less analytically detailed, less frequency extension at either extreme. JGH's reference until the SP11 came along. Can be improved by bypassing switching and balance control. Latest version reputed to be better than this description, but as yet unauditioned. (Vol.7 No.3, Vol.8 Nos.2 & 4)

Convergent Audio Technology SL-1
Borderline Class A according to AHC, this tube design closely approaches the SP11 in some areas, in particular the bass and midrange, and even surpasses it in the high treble. It loses out in terms of dynamics, however, hence an overall Class B rating. (Vol.9 No.7)

Klyne SK-5A
Incredibly clean, quick, detailed, smooth, open, and solid, with superb imaging and soundstaging. One of the most neutral preamplifiers, but a lack of sympathy to systems having a forward balance precludes a Class A rating. Particularly suitable for moving-coils (includes a variable-gain head amp and HF roll-off switching). (Vol.10 No.6)

Motif MC-7
The Motif is a transistor preamp designed by Conrad-Johnson, and sounds it. In fact, it has the same virtues as the Premier Three, but is better at them: the high-frequency sweetness is there, but highs have more extension; the imaging is as three-dimensional, but more specific. Highly recommended; the only thing missing is the warm glow of the tubes. (Vol.9 Nos.1 & 7)

C

Adcom GFP-55
A slight loss of transparency and a restricted soundstage keep this otherwise excellent $500 preamp from competing with the Class B contenders. Unique for an "audiophile" product in that it features tone controls. Like the PS 4.5, a best buy. (Vol.9 No.7)

Conrad-Johnson PV5
Not really competitive in price with the other Class C units ($1485), the PV5 sounds wonderful. Quite euphonically colored, but seems to get in the way of the music so little. An ideal preamp for CD-player owners. (Vol.7 No.3)

Lazarus
Lively and clean sound, superbly transparent, easily surpassing, for example, the Berndt TF-10. A slight glare in the upper mids and grain in the treble bar it from the Class B collection, and DO was worried about the fact that it cannot be turned off, which could lead to excessive tube-replacement costs. The Cheapskate loved it, however, feeling that it was the ideal preamp to render silver-disc reproduction nearer to that of black. (Vol.9 No.2)

The Mod Squad Line Drive
The ideal "preamplifier" for a CD-based system, given that its passive nature will mean that cables must be kept relatively short. (Vol.10 No.3)

NYAL Minuet-in-A
Warmish tonal quality, coupled with a low-noise phono input and wide, deep (but ultimately a little unclear) soundstaging make this tube/FET hybrid good value. Some doubt over availability. (Vol.10 No.6)

PS Audio 4.5
Beautifully built with superb sound, especially considering the price. Class B sound with line stage switched out and using CD as source, in which AHC found little to criticize, but system matching then becomes tricky in terms of gain and frequency-extreme rolloffs. Phono stage is near-Class B, but with line stage in, drops to Class C overall, the sound becoming leaner and less transparent. (Vol.9 No.7)

D

Conrad-Johnson PV-3†
At $300 in kit form, this used to be the lowest-cost way of acquiring a full-function tube preamplifier. Switching is limited, volume control doesn't track very well, and it has a notably fat midbass and rolled-off highs, but the sound is nonetheless quite attractive. (Vol.5 No.10, Vol.6 No.3)

Dynaco PAS-3X†
Owners of this venerable classic should not yet throw it out; if you come across one at a garage sale, snap it up. Replacement of capacitors, upgrading of the rectifier and power supply, and replacing resistors can turn an old PAS-3X into a respectable preamp. You can buy a Van Alstine update kit ($100) and turn your old PAS-3X into a very nice-sounding product. (NR)

NYAL Moscode SuperIt
Bargain phono-only preamplifier, with volume and balance controls. Smooth and sweet top end; firm, articulate bass; good sense of dynamics. Well-defined, wide soundstage, but inferior to Class B preamplifiers at localizing instruments in space. Add a QED or Old

Stereophile, November 1987 91
Colony line-level switch box and you have a remarkably inexpensive, full-function, high-end preamplifier. (Vol.9 Nos.6 & 8)

**Phoenix Systems P-100**

This offers truly high-quality phono preamp quality at an astonishingly low price ($99 kit, $149 assembled). A "black box" with only an AC switch and a stereo/mono switch, it accepts a MM cartridge and delivers line-level RIAA-equalized outputs to your main control preamp. The sound is clean and dynamic, a little thin at the bottom (there's a good chance this was corrected in later versions), with a wide, deep soundstage, remarkable midrange clarity and sweet highs. (Vol.8 No.2)

**Quad 34**

A lack of transparency prevents the latest version of this well-made solid-state preamp from attaining a Class C rating, but superbly thought-out tone controls will make it the model of choice for many audiophiles less concerned with the ultimate retrieval of information than with the need to render poor or badly preserved recordings musically acceptable. (Vol.10 No.3 Cheapskate)

**Superphon Revelation Dual Monot**

Once the only solid-state preamp that could be recommended at under $500, the $460 Dual Monot is being sold at a close-out price of $399. A pain to use (separate volume controls), but the sound quality hints at the best available from a solid-state design, particularly with MM cartridges. Limited input switching. (Vol.8 No.4, Vol.10 No.6)

**Krell KRS-1A, Klyne SK-6, Motif MC-8, Cello Audio Suite, PS Audio 5.0, Conrad-Johnson Premier Seven.**

**Moving-Coil Step-up Devices**

**Audio Research MCP-33**

Much the same open, three-dimensional sound as the SP10 preamp (with which it's not intended for use), the MCP-33 will benefit many preamps. Front-panel switchable cartridge loading (a big plus). Not for use with really low-output cartridges such as the Ortofon MC-2000. (Vol.8 No.5)

**Audio Research MCP-2**

A transistor step-up that provides almost the open sound quality of the Klyne SK-2A (see below), for the same price as the tube MCP-333 ($1395), with greater ease of use and slightly less flexibility. Rolls Royce construction. (Vol.8 No.5)

**Conrad-Johnson Premier Six**

Possessing similar colorations and transparency to the Premier Three, the Six can be ideal for use with transistor preamps, but requires careful matching. Quite expensive ($985). (Vol.8 No.5)

**Counterpoint SA-2**

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

**Klyne SK-2A**

A close rival to the Counterpoint SA-2, the basic difference here being solid-state vs tube. Superb bass, very deep and tight, excellent high-frequency extension, excellent imaging. It still lacks the 3-dimensionality of tubes, but only slightly. Adjustable high-frequency rolloff and cartridge loading is a boon for those with several MC cartridges. A bargain at $695. (Vol.7 No.3, Vol.8 No.5)

**Fidelity Research XG-5**

The least coloration of any transformer AHC has heard; less expensive, more convenient, and lower information loss than "The Head," which we used to recommend. (Vol.8 No.5)

**Princeton Design Group Active Cartridge Stabilizer**

Shorts the output of any pickup (MM as well as MC) and amplifies resulting current; seems to improve the sound of most pickups; not suitable for higher-impedance MMIs. Class B ranking is a guess—audition in home system and decide whether it's worth the price. (Vol.9 Nos.1 & 3)

**SOTA Headamp II**

Somewhat warm and sweet, superb inner detail, good HF detail, excellent soundstage presentation. The solid-state step-up to use if you like the sound of tubes, but can't afford to buy them. (Vol.7 No.8)

**Music Reference RM-4B**

Not as good as the best tube step-ups, but similar in character and less expensive. The RM-4B is flexible and a good deal. (Vol.8 No.5)

**Power Amplifiers**

**A**

Editor's Note: Class A amplifiers differ sufficiently in character that each will shine in an appropriate system.

**Audio Research D-250-II "Servo"**

In the super-amplifier sweepstakes, the D-250-II is analytical and revealing, yet musically natural and unfatiguing. Not the typical tube sound: extended highs, very good bass control (though still short of the best solid-state), close-up and intimate midrange with tremendous detail. According to LA, the 250-II may be outdone in the bass by some, but the sense of aliveness from the midrange on up is unequalled. (Vol.9 No.5)

**Audio Research M-100**

Felt by some to surpass the D-250, this tube monoblock is the least "tube-sounding" amplifier JA has heard. And that's a compliment. Sounds best with its input-level control bypassed. (NR)

**Counterpoint SA-4**

An OTL and OCL mono tube design which is the "perfect amplifier for the 17th and 18th centuries," according to AHC. Sweet, airy, and close to the D-250 Servo in its ability to deliver recorded detail. Works well with electrostats, despite limited current delivery into low impedances. (Vol.9 No.4)
Jadis JA-30
Auditioned by DO with old Quads, this modest (but not inexpensive!) mono tube amplifier produced Class A sound quality, striking the right balance between tube “liquidity” and tube midrange glare. Imaging, timbral accuracy, and transparency are exceptional. Audition carefully with your chosen loudspeakers; they may require rather more drive than the Jadis can provide, even though the latter overloads very gracefully. (Vol.10 Nos.2 & 7)

Krell KMA-100 Mk.11
By all accounts, the latest version of this 100W mono amplifier is the best Krell has yet produced, eliminating virtually every trace of upper-midrange glare. Exceptionally transparent, it gets close to getting the best from any loudspeaker with which it is used. Forget the apparently modest power rating; this amplifier is almost a true voltage source and can dump current into very low loads. (Vol.10 No.2)

Krell KSA-100 Mk.11
For a while more popular in Japan and Europe than in the US, this elegant pure-class-A dual mono muscle amplifier, now in Mk.II form, is becoming recognized here as totally unflappable when it comes to driving real-life loudspeaker loads. Bass is the tightest you will hear, apart from the KMA-100; soundstaging is excellent, with depth aplenty on recordings possessing it; but choose ancillaries with care as the Krells’ transparency will let you hear exactly what’s wrong farther upstream. (NR)

Threshold SA/1
Relatively moderate power for the price, but the “sweetest, smoothest high end this side of Audio Research,” according to JGH. 160W “Stasis” mono design. Add low-frequency authority and a slightly laidback midrange, and you have a solid-state amplifier only bettered by the best tubes when it comes to the presentation of soundstage. (Vol.9 Nos.1 & 3)

Boulder 500
This class-AB unit, based on Deane Jensen’s 990 discrete op-amp design, extends the traditional bass strengths of solid-state amps throughout the audio frequency spectrum. Very neutral in character, but with just a trace of hardness in the mids and treble. Transparency and resolution of detail rival that of the best cost-no-object designs. (Vol.9 No.5)

Classé DR-3
Low 25W output per channel and class-A operation remind one of the classic Mark Levinson ML-2. Melower and richer than the Krells, and lacking dynamics, the Classé DR-3 produces a sweet, detailed sound, with surprising output capability for the modest power rating. Particularly well suited to Apogee Scintillas. (Vol.8 No.8)

Krell KSA-50 Mk.11
The latest ‘50 sounds similar to the ‘100, giving up 3dB or so of ultimate level, but has less good—if still outstanding—soundstaging. Nearest of all Class B amps to achieving Class A status. (Vol.8 No.5, KSA-50 Mk.1)

Mclnty MTR100
Impressive and physically attractive solid-state monoblock, lacking soundstage depth, despite very transparent sound, when compared with Class A units. One of the more musical amplifiers around, according to AHC. (Vol.10 No.2)

Mirror Image 1.1s
High power, coupled with excellent retrieval of detail, a smooth midrange, and lean, tight bass make this a good amplifier to drive speakers with a loose low end. Will sound too lean with speakers having a similar balance. (Vol.10 No.6)

Nestorovic Alpha-1
Driven in balanced mode (by, for example, the Klyn SK-5A preamp), this tube monoblock comes close to combining the best of solid-state performance with the best of tubes, being euphonic-sounding but with a tight, well-controlled bass. (Vol.9 No.8)

Quicksilver
The Audio Cheapskate found the mono Quicksilvers to be ideal with the Quad ESL-63s. Others have found them to work beautifully in a lot of low-power situations. Wonderfully tube-like, superb standards-setting midrange; can drive low impedances due to an excellent output transformer. A bargain, even at $1400/pair. (Vol.7 No.3, Vol.8 Nos.2 & 4)

Adcom GFA-555
Wide, deep soundstaging, excellent imaging, very neutral sound, smooth, detailed, and open highs, excellent low-end heft and control. (Vol.8 Nos.4 & 7)

BEL 1001
A versatile and very powerful 100W amp with extended high end, sweet upper midrange and lower treble, tremendous drive in the mid/bass. Not as powerful in the very low bass (below 30Hz) as its brother, the 2002, and not as much like an instrumentation amplifier. Perhaps a bit more listenable on a wider range of systems, and significantly less expensive at $1395. Potential Class B, but re-auditioning necessary. (Vol.7 No.7)

British Fidelity P170
Designed by tube maven Tim de Paravicini, this MOSFET power amplifier from a go-ahead British company is similar to the less-expensive B&K ST-140 but is more transparent. “The finest all-round power amplifier” the Cheapskate has heard “for under a kilobuck.” Not as lifelike in the mids as the C-J MV50. (Vol.9 No.4)

Conrad-Johnson MV-50
A classic tube amplifier, with under-controlled bass, but also a quite superb midrange and lower treble, which happen to be the most critical regions for music reproduction. Very liquid. The antithesis of grainy sound. (Vol.9 No.2)

Discrete Technology LS2
More musically natural than the PS 200, and a warmer balance than the Adcom GFA-555, the solid-state Diceh is less powerful than either. A touch of highest-end sound with a taste of tube quality for less than $1000. (Vol.10 No.2)

Electron Kinetics Eagle 2
Now in Mk.II form. Alive, up-front sound, very wide, moderately deep soundstage, excellent imaging, crisp, smooth, detailed and open highs, excellent definition

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and inner detailing, unsurpassed low-end punch and control, but a tendency for the sound to become too up-front. Borderline Class B rating, depending on the loudspeakers with which it is mated. Now sold direct at under $1000, making it good value for money. (Vol.8 No.4)

Onkyo M-508
Unusually good soundstaging, with sweet top end reminiscent of tube designs. Bass perhaps lacking the last amount of visceral wallop, but excellent value for money. (Vol.10 No.4)

VTL 30/30
Low-powered $1000 tube amplifier, British-designed but made in the US, latest version offers many of the virtues of much more expensive models, with spacious, open sound quality and good soundstage focus. (Vol.10 Nos.2 & 6)

D (Separates)

B&K ST-140
The B&K costs little enough ($440) to make it into Class D, and the sonics are almost good enough for Class B. It features a very easy and enjoyable high end, deep but not extraordinarily powerful low bass, and good performance elsewhere. We can't figure out how B&K does so well for so little. (Vol.7 No.4, Vol.10 No.7 Cheapskate)

Bering EA-230
If you have an efficient system that likes tubes, the Bering offers you the best sound available for $900; it also puts out the most refined sound for a Class D amplifier, albeit at low power. Very sweet, with superb resolution of inner detail. Be careful of the output rating, though: 30W just isn't enough for most of the speakers popular these days. (Vol.5 No.1)

Carver M1.0t
The result of Bob Carver's notorious challenge to Stereophile that he could make an amplifier sound the same as a selected tube amplifier, the M1.0t's sound is definitly tube, although in our opinion, the production version doesn't sound like the target amplifier. Dynamic range is excellent, soundstaging is somewhat two-dimensional, low frequencies are extended but a little ill-defined in the upper bass, and the treble is 'tinkily.' A lot of watts for the money. (Vol.10 No.3)

Hafler XL-280
Forget the fuss about the claimed "perfect" performance, this new Hafler offers high power and basically good performance at an affordable price. Bass is a little exaggerated and treble too dry for JGH's tastes, but otherwise recommended. (Vol.10 No.1)

NAD 2600
One of the highest-powered amplifiers available in its price range. Depth is slightly flattened, and midrange a little laid-back, but this NAD features a high end that, according to JGH, is "gorgeously smooth," not a bit like the typical "mid-priced solid-state amp." (Vol.10 No.2)

Quad 306
The best current-dumping amplifier yet from Quad. A little expensive when compared with the B&K ST-140, but recommended nevertheless. (Vol.10 No.3, Cheapskate)

D (Integrated Amplifiers)

Audiolab 8000A
Probably the finest-sounding British integrated amplifier, as well as one of the most versatile. A little expensive in the U.S. (Vol.9 No.1)

British Fidelity A-1
Underpowered class-A integrated amplifier, runs too hot for comfort, but provides superb sound within its dynamic limitations. An ideal amplifier for old Quads and small, efficient boxes. (Vol.9 No.1)

Harman/Kardon PM-655
A good buy, this integrated amp with very good built-in MC inputs has clean, punchy, very detailed sound that is just a little cold. It has good depth and detail, moderately good bass. (Vol.8 No.5)

Lux Brid LV105
Unusually good Japanese integrated amplifier features tubes in the driver stages. Excellent dynamic contrast. A little expensive for Class D, perhaps. (Vol.10 No.3)

Mission Cyrus Two
Small, visually appealing integrated amplifier with good, low-noise MC input. True high-end sound (if a little forward in nature), coupled with the ability to drive loudspeakers to high levels. Add-on PSX power supply gives the equivalent of a high-end preamp/power amp combination. (Vol.10 No.7)

Rotel RA-8208X
Only 25Wpc, this integrated amp has better bass than the Creek CAS-4040 but is otherwise not quite as good. Slight treble hardness. (Vol.8 No.5)

K
Don J. Cochran Delta Mode amplifier, Mark Levinson No.23, Audio Research M300.

Deletions
Conrad-Johnson Premier Five not auditioned in its current form. NYAL. Utterman OTL-1 and '4, due to uncertainty over servicing arrangements. PS Audio 200C, due to lack of auditioning of latest version.

Speaker Systems

A
The WAMM
This $45,000 system does everything extraordinarily well (delicacy, balance, authority, pinpoint imaging), but in two respects it's unequalled. No other system we've heard does as well at telling you what the other components in your system are doing; and none other gives you quite the feeling of weight and authority of a real orchestra. (Vol.6 No.3)

B
Apogee Duetta Mk.II
Elevated low frequencies, a rolled-off high treble, and chronic insensitivity prevent this superbly transparent and always musical loudspeaker from becoming a universal recommendation. Coupled with Krell-standard electronics and a light-balanced cartridge—the Carnegie, for example—the latest Duettas could be the basis for a system capable of giving extended musical enjoyment, due to the lack of any kind of resonant signature impressed upon the sound. (Vol.9 No.7, Vol.10 No.1)
Apogee Scintilla
Very fussy in set-up and revealing of the quality of the electronics used to drive it, the Scintilla can provide very revealing and coherent sound when everything is just right. Low bass is generous but integrated and cohesive; midrange has extraordinarily natural timbre, and detailed soundstaging. You'd better have an amp capable of lots of current as the load impedance dips below 1 ohm. (The previous 4-ohm option has been discontinued.) (Vol.8 No.3)

Celestion SL600
A miniature, admittedly, lacking the bottom octave-and-a-half of bass extension, and possessing slightly depressed mid- and extreme treble ranges that makes system optimization difficult, the SL600 combines transparency and holographic imaging with a musical balance unique for a box speaker. Poor perceived value for money, but sees off most of the moving-coil competition in these areas. Worth using with high-end (solid-state or Audio Research) electronics. (Vol.10 No.2)

Celestion System 6000
Based on what is possibly the finest subwoofer extant, the 6000 combines the virtues of the SL600 with a true 20Hz bass extension and improved midrange transparency. Expensive, however, not even including the need for a separate stereo power amplifier to drive the enclosureless subwoofers. (The latter are worth auditioning with the Quad ESL-63 to give that attractive system bass extension and power handling.) (Vol.10 No.2)

KEF RI07
The first British loudspeaker with truly extended bass. JA feels the '107 to be one of the best speakers to come from the UK, main shortcomings being a lack of transparency in the treble, perhaps being due in equal parts to its aging tweeter and to the active equalizer, and upper-bass fatness. Low frequencies are capable of an exceptional level of fine-tuning to best suit room acoustics and positioning. (Vol.9 Nos.4 & 7, Vol.10 No.2)

Magneplan Timpani IVa
Offering excellent performance for their $3800 price, the IVAs have exceptional high frequency performance and a delicate midrange with excellent harmonic accuracy. Though not as fussy as the Scintillas, room considerations and placement are more important than with most speakers for proper imaging. Bass is good, but requires an amp with high current capability. Most serious weakness is a lack of impact, particularly in the lower midrange. (Vol.8 No.6)

Magneplan MG-IIIA
Hard to set up, requiring more than the usual love and care, but uncolored and easy to drive. Works beautifully with smaller ARC amplifiers. Tonaly very neutral, apart from a tendency to brightness in smaller rooms, which can be alleviated by inserting a 1- or 2-ohm resistor in ribbon tweeter feed, and a degree of “Maggie slam” in the upper bass. Coherent, transparent, musically satisfying, excellent value for money. JA and MC recommend this speaker highly; JGH could not, based on its failing his “goosebump” test, albeit when compared with more expensive speakers. (Vol.7 No.4, Vol.9 No.4, Vol.10 No.1)

Martin-Logan Monolith
This hybrid electrostatic/dynamic system is very detailed, transparent, and realistic, with very good imaging and soundstaging, but it tends toward excessive brightness. Lows require lots of current capability from the amp, but can be very deep and tight, though the Monolith gives up something to the best competition in this range. (Vol.8 No.3, Vol.9 No.3)

Quad ESL-63
Very musical, natural imaging, excellent soundstaging, tight but not very-deep bass, very good resolution, limited maximum-volume capability. (In Santa Fe, with its 7000-ft altitude, this was a strict 97dB on peaks.) Later models are less dry-sounding than early production. Can really come alive with the right amp, usually tubed (Futtermans are ideal). Benefits from numerous modifications, most especially suitable stands. Aficionados should investigate the Celestion dual-mono subwoofers. (Vol.6 Nos.4 & 5, Vol.7 Nos.2 & 7, Vol.8 No.3, Vol.10 No.1)

Sound Lab A-3
JGH's current reference, this big curved-panel, full-range electrostatic produces exceptional imaging and a stunningly natural midrange. Warm-balanced, the treble is sweet and musical. Sensitivity and dynamic range are on the low side. Unlike all other Class B speakers, it is very close to JGH’s personal Class A. (Vol.9 No.6)

Synthesis LM300
Tonal balance somewhat bright, but excellent detail and an "open and coherent treble," noted TJN in his review, coupled with deep, well-defined bass and almost holographic imaging. (Vol.10 No.7)

Thiel CS3.5
One of the finest US-designed box speakers, the 3.5 is a result of a long collaboration between designer Jim Thiel and the drive-unit manufacturers. Combines excellent low-bass extension—an active equalizer is used—with superb transparency and imaging. A balance opposite to that of the Apogee Duetta, with a slight tendency to a tilted-up HF, makes system matching crucial. (Vol.10 No.1)

C
Angstrom Reflection
Tuneful low frequencies, low levels of coloration, and excellent retrieval of detail offset by slightly unforgiving nature of treble. (Vol.10 No.3)

Celestion SL6S
A little lean in the upper midrange but excellent imaging, coupled with musical tonal balance and good bass definition and dynamics (when used on appropriate high-quality stands). (Vol.10 No.5)

GNP Valkryie
Laid-back tonal balance but superb soundstaging, low coloration, and good highs. (Vol.10 No.3)

Monitor Audio R652MD
Superb highs, midrange, and soundstaging let down slightly by somewhat one-note low frequencies, this less a problem on classical program, however. Beautiful finish and intentional near-wall positioning imply a very high Wife Acceptance Factor. (Vol.10 No.5)

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Snell Type C/i
Expensive for Class C and an unprepossessing array of drive-units, but a sound very well-integrated from bottom to top. High frequencies, in particular, are surprisingly natural, and deep bass is impressive. We suspect borderline Class B performance, but further auditioning is required. (Vol. 10 Nos. 2 & 6)

**Spectrum 410**
Very smooth high frequencies but detailed sound overall and above-average imaging. Bass overly ripe, however. (Vol. 10 No. 3)

**Spendor SP-1**
The Cheapskate reports that these successors to the classic BC1 do not do anything wrong! Very neutral, excellent imaging and depth, tight and moderately deep bass, somewhat lean, forward sound, sweet and liquid midrange, smooth yet crisp highs. DO concurs down the line. Class B if you lean to a classic British sound, otherwise high Class C. (Vol. 8 No. 3)

**Spica TC-50**
The coherence and imaging of the mid- to upper-midrange rival the Quad and would be considered excellent in a speaker of any price; at $450 they’re a steal. The high frequencies roll off above 14kHz and the low end is designed to be very controlled down to the lower limit of about 55Hz. This makes it perfect for matching to a subwoofer—Spica subwoofer is best used in pairs but still limited dynamics—but it sounds a little lean as a stand-alone. Easily damaged by amplifier overload. (Vol. 7 Nos. 2 & 3, Vol. 9 Nos. 5 & 7)

**Synthesis LM-210**
Excellent dynamics and very transparent sound, coupled with a good standard of neutrality. (Vol. 10 No. 8)

**Thiel CS1**
Balance a little tilted up in the treble, but superb midrange, well-tuned low frequencies, and precise stereo imaging lead to very musical results. (Vol. 10 No. 5)

**Thiel CS2**
The CS2 has a slightly better high-end balance than the earlier CS3, and a markedly lower price, but lacks an LF equalizer. The CS2 does it all: remarkable coherence, excellent imaging, natural midrange, extended highs. Based on experience in Santa Fe, though, the HF content has to be watched—anything too extended or peaky preceding the speakers will make the sound a bit relentless. (Vol. 8 No. 6)

**Vandersteen 2C**
After nine years of continual refinement, an excellent full-range box speaker, according to AH. Balance a little rolled off in the highs but “a joy” in the midrange and bass. Borderline Class B. (Vol. 9 No. 6)

**D**

**Acoustic Research 35T**
Neutral HF balance, coupled with good imaging and well-controlled bass. Recommended only when used in biwired mode, otherwise lack of transparency exacerbated. (Vol. 10 No. 7)

**Kindel P-100 II**
Natural sound, if a little laid-back, with subtractive rather than additive errors leading to forgiving balance. Imaging only fair, but good performance overall at the low price. (Vol. 10 Nos. 4 & 6)

**JBL 18Ti**
Sound a bit exaggerated in the lower treble and bass is lightweight and rather loose, but excellent dynamics. Good value for money. (Vol. 10 No. 5)

**Magnepan SMGa**
Musical sound, with relatively well-extended low frequencies, considering the size of the panel. Not that transparent, and high frequencies recessed, but a musical bargain, nevertheless. (Vol. 10 No. 7)

**Monitor Audio R352**
A large box, offering good bass quality and high sensitivity at a competitive price. (Vol. 10 No. 7)

**Nelson Reed 5-02 Satellites/Subwoofers**
Very good middle range, wide and deep soundstage, mediocre imaging, smooth and slightly soft highs, lows very respectable with subwoofers. (Vol. 8 No. 3)

**Quadrant Q-250**
Not outstanding in any one area, but overall quite musical. Lower midrange a little uneven despite claims made for unusual box shape minimizing resonances. (Vol. 10 No. 8)

**Rana Tyr II**
Very smooth, neutral, musical with excellent imaging and soundstaging. A good, musical buy at $400. (Vol. 9 No. 2)

**Siefert Maxim IIID**
Very good high frequencies and surprising bass extension for what is quite a small enclosure. Upfront balance will mean some care in system matching. (Vol. 10 No. 4)

**Siefert Magnum III**
Superb LF extension at the price and clean treble, offset by exaggerated bass, only fair imaging, and a lack of midrange transparency. (Vol. 10 No. 5)

**Spectrum 108A**
For $229 a pair, these small speakers have good balance, no deep bass, but tight and well-controlled mid and upper bass, good imaging, and smooth but somewhat closed-in highs. (Vol. 7 No. 8)

**Spectrum 208A**
Very similar to the 108s (above), but with deeper bass and higher power capability. Won’t go well with many low-priced amplifiers and preamps because they’re so revealing at the high end. (Vol. 5 No. 10, Vol. 8 No. 3)

**K**
Wilson Audio WATTS, Magnepan MG2.5, Stax ESL-F81, Celestion SL700.

**Deletions**
Wharfedale Diamonds, due to lack of US distribution. Acoustat 1+1 obsolete.

**FM Tuners**

**A**

**Magnum FT-101**
An analog tuner, the FT-101 is superb from an RF standpoint, particularly in quieting and sensitivity. Selectivity is bettered only by the Onkyo, but the 101 consistently sounds superior on most stations. Used as a reference. Examination of three different samples confirmed good QC. (Vol. 8 No. 4, Vol. 10 No. 3)
Magnum 205 FM Booster
Not a tuner, but an excellent RF amplifier to optimize selectivity and reception in areas of poor signal strength. (Vol.10 No.6)

Onkyo T-9090
RF champ. This tuner gets more stations clearly than all others tested. Very slight high frequency distortion. “A $2600 tuner that sells for $600.” (Vol.7 No.7)

Yamaha T-85
Excellent noise performance—one of the quietest DAS has tested—is coupled with good selectivity and a sensible balance between sound quality and RF performance. “A winner!” (Vol.9 No.8)

Accuphase T-107 (not T-106)
Good looks. Only flaw is a mechanical mono-stereo relay that makes popping noise. Less selective than Class A tuners but is a champ at capture ratio. Very effective noise reduction does not significantly reduce stereo separation. Good sound except for bass dynamics—lacks the punch to really impress on rock or pop. (Vol.8 No.7)

ADS Atelier T2
Offset tuning for use on cable FM. Good high-blend and no serious problems. No built-in antenna on AM. (Vol.8 No.1)

Akai AT-S7BN
A relatively inexpensive ($280 list, discounted heavily) tuner that performs along with the best of Class B. Good appearance, very good selectivity and sensitivity, and good performance in other areas. Very quiet stereo with only 10uV. Only weakness is an inconvenient tuning meter and poor interface with preamps having less than 50k input impedance. (Vol.8 No.4, Vol.9 No.8)

Luxman T/02
Excellent S/N, good selectivity, and superb SCA rejection. Sounds best in narrow bandwidth position on most stations. Good AM. (Vol.9 No.3)

Marantz ST551
Excellent audio when fed a strong signal, coupled with good RF performance. Excellent AM section. (Vol.10 No.6)

Mission Cyrus Tuner
“One of the most sonically satisfying tuners” read DAS’s review. Excellent separation, but merely average RF performance keeps this little British tuner from Class A. A sonic best buy for those who live in strong signal areas. (Vol.9 No.5)

NEC T-6E
A best buy in Class B for $229, the NEC is still our value champion. Good sound and performance surpassing several $1000 class tuners. AM very sensitive. (Vol.8 No.1)

Onkyo T-4087
Most selective of all tuners in group B. Does most things well, but not quite up to the more expensive T-9090. Low noise reception on cable FM. (Vol.9 No.3)

Quad FM4
Good quality construction. Very sensitive with flawless audio if properly aligned. Lacks high adjacent channel selectivity and mono-stereo switch. (Vol.8 No.4)

C
Arcam Alpha
Straightforward analog model, with tube-like sound quality that lacks the graininess common to many tuners. Recommended within its RF limitations. (Vol.9 No.8)

Nikko NT-950
Good RF performance, but not good enough sound to make this a Class B tuner. Low distortion in wide IF mode, but quite high in narrow. (Vol.6 No.6)

Proton 440
The best of the Schotz noise-reduction tuners. Superior fringe performance when high adjacent channel selectivity is not needed. Audio good, but not as clean as Class B tuners. One of DS’s favorites. (Vol.8 No.1)

Sansui TU-D99 AMX
Receives Kahn and C-Quam AM stereo. Very low distortion and noise on FM if unit purchased is aligned correctly. Lacks only high selectivity on FM. (Vol.9 No.3)

Pioneer TX-V1160
Very sensitive and selective FM; unlike other products here, the V1160 includes a TV tuner, which has good AFC. AM mediocre. Lacks manual mono-stereo switching and has slight distortion on FM. Both an excellent value and a means of enjoying stereo TV at low cost. (Vol.8 No.7)

D
Bogen TP-100
Very clean sound; good stereo. Small size, good looks make it a good choice where space is at a premium. Usable only for medium strength signals. Sensitive AM. (Vol.9 No.3)

Harman/Kardon TU905
Sensible tuner with separate muting, stereo-mono and high-blend switches. Stereo separation is topnotch; all other specs are fair. A good utility tuner for $215. Close enough in price, however, to consider moving up to the NEC or other under $300 tuners in Class B. (Vol.9 No.5)

Signal Processors
Editor’s Note: I feel that to continue to recommend dynamic-range expanders, compressors, aural exciters, equalizers, ambience extractors, etc., etc., is not in the true spirit of high fidelity, where the reproduction should be true to what the engineer and producer intended. The only processors still recommended are those which can prove useful in rendering acceptable the playback of historical material.

A
Packburn 323 and 103 disc-noise-reduction devices
Quite expensive, and frankly intended for professional (archival) use, the Packburns are the best such devices made. They can remove the maximum of surface noise—ticks, pops, and hiss—from shellac or vinyl discs with a minimum of signal degradation. (Vol.5 No.8)

K
Cello Audio Paletta
Surround Sound Decoders
(Dolby MP, Ambisonic UHJ, SQ)

A

**Yamaha DSP-1 ambience synthesizer**
Digital processor supplies suitable signals to feed up to four additional amplifier/speaker combinations in order to synthesize the reverberation of either a number of real halls or that specified by the user in the listening room. "Rush out and buy!" said BS. (Vol.10 No.4)

B

**Fosgate 3601**
Good Dolby surround decoding, but not as spectacular as the Shure; good stereo synthesis and ambience extraction; full surround synthesis from stereo is ping-pong; but effective and fun; center-channel and subwoofer output; variable bass boost; power amp for rear speakers. Hard-wired remote control; sound more colored, less suave, than the Shure. (Vol.9 Nos.2 & 4)

**Shure HTS-5000**
Cleanest, most transparent and detailed sound of any surround decoder, spectacular, "theatrical" decoding of MP, if less good than the Fosgate; very good stereo synthesis and ambience extraction except that the image collapses in the presence of front-center info (audible only when you use a center speaker). It does not synthesize full surround from stereo; center channel and subwoofer outputs; convenient wired remote control. (Vol.9 No.2)

C

**Aphex AVM-8000**
Good MP decoding, without a delay line; potentially spectacular sound, with up to 8 distinct outputs. SQ decoder has severe audible crosstalk; sound less colored and slightly less transparent than 3601; good full-surround synthesis from stereo; center-channel and subwoofer output; excellent cordless remote control. (Vol.9 No.2)

**Fosgate Tate 101A+**
Best SQ decoder yet produced; discontinued, but worth looking for if you need SQ decoding; has position for Dolby MP but there is some front/back spill at higher frequencies; hard-wired remote control; rough top end and some veiling.

**Minim AD-10**
BS judges this to be the best UHJ decoder for the best (Ambisonic) surround system; ambience extraction dependent on quality of program material, but generally very good; excellent full-surround effects, which are continuously variable; can produce stable side images from both UHJ and stereo material; outputs for up to six speakers; dull, slightly veiled sound. (NR)

Home Recording Equipment

Editor's Note: microphones have been dropped from the list as no one on the staff has recently had extensive enough experience with the latest types to make accurate judgments. Professional models to look out for on the secondhand market, however, are cardioid microphones from Sony (C37P & C500), Milah and Calrec, figure-eights from AKG, B&O and Coles, omnis from Schoeps and B&K, and PZM micros from Crown. The Shure G81 cardioid is also reported as having quite a flat response. Ignore all "amateur" microphones; as a rule of thumb, you should spend as much, or more, on a good pair of mikes as you do on your recorder.

A

**dbx 700 PCM processor**
"A more solid sense of the fundamental," said BS in his review, when compared with the Nakamichi DMP-100, with a smooth brass tone. Expensive, but undoubtedly the best recording system this magazine has yet reviewed. (Vol.10 No.5)

**Sony DTC-1000ES R-DAT recorder**
Unavailable in the US at the time of writing, due to uncertainty over the question of CopyCode. Offers all the sonic performance and more of Sony's PCM-Fi/VCR combination in a small, user-friendly package, with all the convenience of CD. (Vol.10 No.5)

B

**Nakamichi DMP-100 PCM processor**
Almost identical to the Sony PCM-Fi, the DMP-100 is built by Sony for Nakamichi, but has some additional work done by Nak to the analog circuitry. The DMP-100 sounds somewhat sweeter than the Fi. (Vol.10 No.5)

**Sony PCM-Fi digital audio processor**
Professional recordists report some (but not huge) differences between their Fi tapes and tapes made on highly modified, 30ips analog machines. The first almost-perfect home recording system. JGH has reported a certain ineradicable dryness on his Fi recordings. (Vol.5 No.7, Vol.6 No.1)

**Tandberg TD20A SE Open-Reel Tape Recorder**
The best buy in an open-reel deck, this now-discontinued deck offers professional-caliber performance at a modest ($1150) price. Better sound than many professional decks, but ergonomics less good than the still-current Revox B77 III. (Vol.7 No.7)

C

**Aiwa AD-F770**
Almost Nakamichi quality at bargain price. Rather bright in tonal balance. (Vol.9 No.7)

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

**Nakamichi ZX-7/ZX-9 cassette deck**
Excellent controls and adjustments, very extended high frequencies, sophisticated tape transport. Neither of these Nakamichis is current, but the latest model from Nak is likely to be just slightly better. (Vol.10 No.1)

**Revox B-215 cassette deck**
Automatic bias adjustment; a superb transport. According to JGH, "A superb cassette recorder, for the
person who wants and is willing to pay for the best quality cassettes have to offer." AHC emphatically disagrees. The latest Nakamichis, with their automatic play azimuth adjust, probably get a slightly bit more off prerecorded tapes. (Vol. 8 No.7)

**Tandberg TCD 3014 cassette deck**
Superb midrange headroom, good transport, accessible and useful controls. Better at $1400 than their previous $2200 model, the 3004 (also a good-sounding deck). Not the most extended high end, but overall the best sound from a cassette deck. (NR, but see Vol.7 No.1)

**D**

Sony WDM-6 Pro Walkman cassette system
A pocketable stereo recording system of surprising quality and versatility. (Vol.7 No.6)

**Accessories**

**A**

Arclci Quad ESL-63 stands
Latest and greatest method of getting the Quads to perform as God and Peter Walker intended. Clamps the ESL-63 in a rigid embrace, also raising it an optimum 16 inches off the ground. (Vol.10 No.1)

ASC Tube Traps
Relatively inexpensive (Ha!) but remarkably effective room-acoustics treatment. These soak up low-to-high bass standing-wave resonances like a sponge. (Vol.9 No.3)

CD Saver
Eliminates scratches from CDs and LaserVision discs, rendering the unplayable playable. (Vol.10 No.8)

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

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

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

**RATA Torelyte Turntable Support**
An elegant, low-mass stand that enhances the performance of suspended subchassis turntables. Recommended to owners of Linn's, SOTAs, and Oracles. (NR)

**Signal Contact Cleaner Kit**
Contains abrasive plastic tools for effective inner cleaning of phono plugs and sockets in combination with Cramolin. (Vol.10 No.6)

**SOTA & Goldmund record clamps**
Though these clamps have a somewhat different sound, they are the best-record-clamping devices on the market. They can both improve top- and bottom-end extension and reduce resonances on any table, including those employing vacuum clamping systems. Well worth their cost in a high resolution system. The SOTA Reflex clamp gives a somewhat richer, warmer sound and is more effective against upper-midrange and lower-treble resonances. The Goldmund shapes up a flabby lower midrange and controls the more serious lower-treble/upper-midrange problems. Both work well with the SOTA Supermat.

**StyLast Stylus Treatment**
StyLast won't make a difference every time you put it on, but it will help provide smoother high-end sound, and is claimed to extend stylus and cantilever life. (NR)

**Sumiko FluxBuster**
Moving-coil cartridge demagnetizer: it really works; you need one. (Vol.9 No.4, Vol.10 No.5)

**Sumiko Tweek Contact Cleaner**
This contact enhancer for use on plugs and terminals actually does improve the cleanliness and resolution of the sound of an already excellent system. Keeps freshly made contacts fresh. (Vol.10 No.6)

**Tiptoes**
The least expensive way of improving the bass and midrange definition of virtually any loudspeaker.

**Watkins Echo-Muffs**
Effective means of reducing amplitude above 200Hz of early reflections of loudspeaker from nearby surfaces, thus improving imaging. Whether or not the aesthetics will be domestically acceptable will be down to personal taste. (Vol.10 No.4)

**WBT RCA plugs**
The best, although steel-locking collet gives rise to neurosis. (NR)

**Good Speaker Stands**
There are too many possibilities, but briefly a good stand will have the following characteristics: good rigidity; spikes on which to rest the speaker; or some secure clamping mechanism; the availability of spikes at the base for use on wooden floors; if the stand is steel, provision to keep speaker cables away from the stand, to avoid magnetic interaction; and the correct height, when combined with your particular speakers (correct height can be anything from what you like the best to the manufacturer's design height for best integration of woofer and tweeter in time-aligned systems). Though Stereophile has neglected to review speaker stands, it doesn't mean we think them unimportant.

**Headphones**

**A**

**Stax Lambda Pro**
Probably the most neutral and transparent headphone available, the Lambda Pro is capable of ear-popping bass, though it doesn't blend well with the rest of the range. Neutral perspective. As delivered, the Lambda suffers from upper-midrange suckout, which disappears after some hours' use. Expensive ($800), but includes own solid-state amp. Very comfortable.

**D**

**Senheiser HD-420 Mk.II**
Veiled in the upper mid, but these inexpensive dynamic all-purpose cans are astonishingly good value. (NR)

**Sony MDR-282 Turbo**
Best of the in-the-ear cans, with LC-OF C wiring, excellent bass response, and a relatively uncolored treble, despite a somewhat overbright balance. (NR)
Record-Care Products

A

LAST record-preservation treatment
This actually works. It significantly improves the sound of even new records and is claimed to make them last longer, though we haven't used it long enough to verify the claim. (Vol.5 No.3)

Nitty Gritty Pro II record cleaner
This semiautomatic wet cleaner cleans both disc sides at once. Slightly less rugged than the VPI, but both do an excellent job and the Nitty Gritty Pro II is faster. Significantly better design than earlier Nitty Grittys. (Vol.8 No.1)

Rozoil Gruv-Glide
Record destaticizing agent that also leads to better sound. Apparently doesn't leave a film or grunde up the stylus. (Vol.9 No.8)

VPI HW-17 record cleaner
Clearly an industrial-quality machine of reassuring quality, the VPI does one side at a time, semiautomatically, and is slower than the Nitty Gritty. "A highly functional and convenient luxury." (Vol.8 No.1)

B

Nitty-Gritty 2.5FI and 3.5 record cleaners
Instead of a vacuuming tonearm as on the Monks, the NG cleaners use a vacuum slot. Cleaning is efficient but they are noisy and harder to use than the Monks. Cleaning is just as good as Nitty Gritty's Pro, at half the price. (Vol.7 No.5, Vol.8 No.1)

VPI HW-16 record cleaner
Manually operated version of HW-17 (above), noisier motor; less money. (Vol.5 Nos.7 & 9)

D

Decca, Hunt-EDA, Goldring or Statibrush record brush
Properly used (held with the bristles at a low angle against the approaching grooves and slowly slid off the record), these are the most effective dry record cleaners available. And they work on low-torque 'tables. Better than the DiscWasher for everyday use, but no substitute for an occasional wet wash. (NR)

DiscWasher record brush
If you don't have a cleaning machine, the DW system will do an adequate job on relatively clean records, but won't get out the deep grunde. If you begin to accumulate lots of gunk on your stylus after cleaning your record with an older DW brush, the bristles are worn out; send it back for resurfacing or buy a new one. A high-torque turntable is required. (NR)

Component Interconnects

A

van den Hul MC Silver
A silly price, but this elaborately wound coaxial cable is apparently flat up into the microwave region, which suggests precision construction. "The best there is!" according to DO (and also MC) as of Spring 1987. The least signature of any interconnect, with the most improvement noticeable on soundstaging and imaging. (Vol.10 No.2, see also vdH interview in Vol.9 No.8)

B

Aural Symphonics As-One
90% of the performance of the other Class B cables for a significantly lower price will make this Teflon-insulated cable a best buy. (Vol.10 No.2)

Magnan Type 2
Remarkable clarity and focus, but less spacious than the Monster, Siltech, or vdH. Midrange is slightly rich, but overall laid-back balance will render its performance somewhat more system-dependent than usual. (Vol.10 No.2)

Monster Cable M1000
Pristine bass, smooth mids, spacious highs, and a tube-like dimensionality render this the best interconnect ever produced by Monster. (Vol.10 No.2)

Siltech 4-24
Astounding transparency and imaging even better than the already outstanding Monster M1000. (Less neutral, though.) The best, were it not for the three-times-as-expensive vdH Silver. Needs "running in." (Vol.10 No.2)

Siltech 2-20
Lower-cost Siltech preserves the 4-24's remarkable midrange but sacrifices overall cohesion and some of the definition at frequency extremes. (Vol.10 No.2)

van den Hul D-102 Mk.II
Not as good as the majority of the other Class B cables, broadly comparable with the Aural Symphonics, with a better treble but slightly worse focus. (Vol.10 No.2)

C

Discrete Technology
Available in two versions, differing in quality of high-frequency reproduction and midrange balance. Almost uncolored; highly detailed; smooth, excellent resolution. A "fast" cable, sometimes at the expense of musical coherence. (Vol.9 No.1)

DNM interconnect
Alvin Gold is totally convinced by this small-gauge solid-core cable, imported by Music Hall. Even if you are not convinced that single-conductor cable is the answer to everything, this flat, spaced-twin interconnect represents undoubtedly good value for money. (Vol.10 No.4)

Monster Cable Interlink Reference A
Reasonably neutral, but with slight HF sweetening tendency, and a fat bass. A safe recommendation, but not in the same league as Monster's new M1000. (Vol.8 No.2)

Straight Wire LSI
A clear best buy in Class A just over a year ago, such has been the pace of development that this undramatic-sounding cable drops to class C, lacking the degree of focus and transparency of the Class A and B cables. Excellent detail and open, airy highs, however, and still an AHC favorite. (Vol.9 No.1, Vol.10 No.2)

D

Hitachi LC-OCF
Open, clean, transparent, but high frequencies can get frazzled and low-level detail obscured when compared with the best. Always listenable. (Vol.10 No.2)

K

MIT Shotgun

100

Stereophile, November 1987
Loudspeaker Cables
(Reported in Vol.8 No.2, Vol.9 No.1)
Editor's note: a thorough update of loudspeaker cables is long overdue and will appear in the magazine when we can persuade some benighted soul to undertake the necessary multi-man-weeks of concentrated listening.

A
Kimber 4TC and 8TC
The latest Kimber has greatly improved Teflon dielectric and widely varying gauges among its strands. The result is widely compatible in different systems, and not too expensive. (Vol.9 No.1)

Livewire Type 10
Polypropylene insulation and a kind of LC copper. Clean and extended highs, deep bass without overhang. Class A sound quality will be more system-dependent than some. (Vol.9 No.1)

MIT MH-750 "Music Hose"
Winner take all! This is the best of the best, almost impossible to fault; bulky, stiff, and awkward to get around, expensive. Still the best.

Randall Research 64TBC
Similar to the MIT but can become very subtly bright with certain components.

Straight Wire Teflon 12
Very neutral, fast, clean, extended treble & bass, excellent HF resolution.

B
DISTech
Teflon dielectric and OFC conductors. Fast, detailed, extended HF and LF, unusually good bass range and heft. Expensive, though.

Kimber Kable 4VS and 8VS
Excellent, coherent across the board, not quite as transparent at frequency extremes as the A cables.

Monster Cable Powerline II and III
Class A cables except for some HF softening; the III is softer than the II.

Straight Wire Music Ribbon
Used straight (Ha!) from the packaging, this has good frequency extension and timbre, but variable soundstage characteristics. Tweaking the options, however, can give a Class A sound. (Vol.9 No.1)

C
Kimber Kable 4PR and 8PR
Good imaging, balance, and dynamics, but not quite as transparent as some.

Livewire BC-4
Excellent except for some upper-midrange hardness.

Monster Cable (Original)
Very good, but lacks resolution and upper-range openness of the better cables.

K
Siltech, Monster M1, van den Hul, MIT Shotgun
VERSAC DYNAMICS 2.0 RECORD PLAYING SYSTEM

J. Gordon Holt

Versa Dynamics turntable and arm

Three-unit integrated turntable/tonearm with air bearings and vacuum disc hold-down. Tonearm adjustments: Tracking force, height and VTA, cartridge tilt, tangency. Effective headshell mass: 10-18 gm. vertical, 56-66 gm. lateral (depending on counterweight and use or not of eddy-current dampers). Dimensions and weights: Phono unit 18½” W by 17½” D by 9¼” H, 41 lbs; Controller 6” W by 17” D by 4” H, 10 lbs; Pump module with noise reduction enclosure 22¾” W by 11” D by 13” H, 50 lbs. (Standard pump is 2” smaller in all dimensions and 10 lbs less in weight.) Price: $7500 with standard pump module; $8100 with noise-reduction enclosure, $4900 turntable only. Approximate number of dealers: 4. Manufacturer: Versa Dynamics, PO Box 3062, Warminster, PA 18974. Tel: (215) 356-1235.

There is something vaguely disturbing about the idea of an $8000 turntable and arm combination. That’s more money than a lot of audiophiles have invested in records through the years. Total overkill! Or so it might seem. But the entire history of analog disc reproduction, from the first LP to the present, has been one of seemingly open-ended discoveries—of subtleties nobody ever imagined were frozen in those tiny grooves, of levels of quality no one ever guessed the medium was capable of. Yes, newer LPs are a lot better than the first ones, but that is only to be expected in any technologically advancing field. What is amazing about the LP is that, 40 years after its introduction, we are still finding out that all of them, from the first to the latest, are better than anyone could have imagined. An improved phono unit doesn’t just make the latest release from Wilson Audio or Reference Recordings sound better, it does the same for every LP you own!

Contrary to a widely held and fondly nurtured belief, there is no such thing as a record player that is “too good for your records.” Record quality is not a threshold, requiring a
certain level of player quality to reveal it in all its splendor. It is, rather, a sliding scale across which all LPs are affected equally by any given quality of record player. Just as the sound of the best records will be degraded by a mediocre phono, the sound of the worst is improved by a better phono.

I'll say one thing for the Versa Dynamics 2.0: It sure looks expensive. Both turntable and tonearm have the appearance of precision industrial machine tools, of the kind the Pentagon delights in lavishing our tax dollars on. The arm assembly weighs about 6 lbs, which evokes memories of the first Dynavector behemoth. In the Dynavector, though, a lot of that weight represented lateral mass for the cartridge, giving it the lowest LF resonance of any consumer arm ever made since the advent of LP. (Off-center discs used to generate homogenous, woofer-pumping pulses at about half a cycle per second!) The Versa Dynamics arm's mass is much lower than that Dynavector's, but is still quite high. The manufacturer specs it at 57 grams laterally and 10 to 18 vertically, but it never caused any woofer pumping during my tests, even with discs that gave the Dynavector hystereics.

The Versa Dynamics 2.0 system is the brain-child of John Bicht, an American design engineer whose name last appeared in a hi-fi context in the late '70s as the designer of the original Mission 774 tonearm. John took a five-year sabbatical from hi-fi, working as a consulting engineer in the US designing electronic manufacturing equipment—his 1981 Die Attach machine, used in the manufacture of IC chips, was faster than anything else previously made—but, as so many before him have found, the lure of the high end proved impossible to resist. He and his partner, Bob Schmidt, sunk their savings into a new company, Versa Dynamics—the Versa Dynamics 2.0 is their first product. It consists of three units: the turntable/arm/base, a controller, and a pump module. The turntable's main platform consists of two aluminum/balsa sandwiches, each a five-layer affair alternating three 0.02" sheets of aluminum with two ¾" sheets of balsa; the upper sandwich is structural, the lower for damping. Additional areas of damped mass are attached to strategic spots underneath. This is suspended above the base by four spring-loaded feet, whose height is adjustable for leveling purposes. (Spring tension is unaffected by the adjustment.) System resonance is around 2.5Hz, which is generally considered to offer the best compromise between stability and vibration isolation.

The platter, also a composite but this time of metal and plastic sheets, rides on a combined thrust and radial bearing using high air pressure, with a vacuum applied to the top surface of the cylinder and pressure applied to its bottom surface. This way, the burden of suspending the platter's not-insubstantial weight is shared by both of the pumps. The drive motor, rigidly affixed to the base, is a 200-position stepper type, driven at 1460Hz by a frequency-stabilized oscillator and a small power amplifier in the controller box. Isolated coupling to the platter is via a light polyurethane belt.

The tonearm is a straight-line-tracking air-bearing type, similar in principle to the
Maplenoll and Eminent Technology designs reviewed in previous issues (Vol.9 No.2, Vol.8 No.7). Unlike those arms, though, the Versa’s carriage-travel rod is not fixed in position at one side of the platter, but swings over it in cantilever fashion from a heavy base pivot at one end. To play a disc, you swing the arm over the disc until it comes to a stop, then use a cueing lever to lower the cartridge. To remove the disc, you have to swing it back to the side.

The arm parts are machined from steel and aluminum, and, except for the carriage rod and the knurled end “handle,” are black-anodized. Every physical parameter is adjustable by means of Allen wrenches (supplied!), setup is quite simple, and the adjustments don’t interact. You can even change VTA while the unit is playing a disc, though tangency readjustment is then required.

There is no arm as such; rather, there is a short arm carriage consisting of two pieces: a removable magnesium “headshell,” which accommodates the cartridge, and the main air-bearing assembly. The interface between these is two precision-machined, lapped surfaces, and the pieces are held together by a single stout bolt. Assembled, the two sections behave as one, providing a rigid path from the cartridge to the body of the arm. (Even with the pump on, there is no perceptible play whatsoever between the carriage and the arm rod. How this is achieved I do not know, but I’ll take my word for it.)

The back of the arm is fitted with an adjustable (or removable) eddy-current “brake” which can be used to provide additional damping of the cartridge’s LF resonance. Whether or not this damping is needed will depend on how much internal damping there is in the cartridge you use, and I found it was not needed with my preferred Ortofon MC-2000. The description of the system’s performance, below, refers to the arm’s use without the added damping.

The control module is a smallish metal box with three bat-handle toggle switches at one end. The module installs near the turntable, and allows one to control from the listening area both the ‘table itself and (through the controller wire) the remotely located pump. When the ‘table is turned completely off, a 24V AC supply in the pump module is applied continuously to the controller cable. When the main power-up switch on the controller is turned on, the 24V control circuit energizes a relay in the pump module, which turns on the pump motor.

The second switch on the controller has three positions. In the Down position, the disc vacuum is shut off and the platter motor is off; Mid position turns on the disc vacuum but leaves the platter motor off. In the Up position, everything turns on. This switch is cycled with the play of each disc. Finally, the third switch is to select the 33 or 45rpm platter speeds.

Versa Dynamics 2.0 control module

1 These are the nicest Allen wrenches I’ve ever seen; they’re shaped like a T, with the top (handle) bar heavily covered with some tough, bright red plastic material which makes the wrench a snap to handle. They are made (appropriately) by the Allen Corp.

2 An eddy current is a circulating electric current (like the mini whirlpools produced by turbulence in the flow of water) which is induced in a sheet of any electrically conductive material by a magnetic field moving relative to the plane of the material. The magnetic field emanating from the eddy current has opposite magnetic polarity to the external magnetic field, so that interaction tends to oppose any change in their relative position (Lenz’s Law: the induced field opposes the field that induced it). That is, the external field is moved in the plane of the sheet of material; it will tend to drag the sheet along with it.

The phenomenon can be used for mechanical braking, as when an unchanging magnetic field is passed through the surface of a rotating metal disc or, in the case of the Versa Dynamics arm, when an unchanging but moving magnetic field is passed through a fixed metal strip. Conversely, an alternating magnetic field can be made to rotate a pivoted metal disc as in the familiar household power meter.
Neither of these has a vernier adjustment, although both were precisely on speed, according to a stroboscopic check.

The pump unit contains a single motor coupled through a common shaft to both the vacuum and pressure pumps (for the platter spindle/cartridge carrier and for the disc hold-down, respectively), and these must be connected to the controller via two thin plastic hoses and a light wire controller cable. Fifty feet of each is supplied, which would seem to offer a wide choice of pump locations. But there may be less choice than there seems, as the pump unit is quite noisy.

The pump is available in a stripped-down (naked) version or, for $600 extra, with an optional noise-reduction enclosure. Our system came with the enclosure already installed, but even so, I measured 77dB of noise at 1 foot from the pump intake. The majority of the noise is at 20 and 40Hz, so it will radiate in all directions from the source, dissipating exponentially with distance through the air. My listening area, and the adjacent areas, are at ground level and have concrete floors, and with the pump in the adjoining room and about 40 feet from where I sit, I could hear the 40Hz noise component with the intervening door open, but could still hear it, albeit barely, when the door was closed and I held my breath. And that was with everything on a very inert concrete floor. There is no question that the pump would have been much more audible on a typical wooden floor.

Since compression tends to condense moisture out of the air, the pump is equipped with a condensing coil and a drain reservoir, which latter gathers and holds any condensate until the system is completely shut down. At this time, a drain valve (held shut by a solenoid while the pump is running) opens and the remaining compressed air expels the water. This happens automatically every time the system is powered down. If the system is operated for several hours straight, the platter On switch won't start the platter, and the LED next to the switch will start blinking. This means you must shut the system off (for about 30 seconds) to purge the water reservoir. Note that this is a time function, and not the result of a Reservoir Full sensor. Under extremely high humidity conditions, beads of moisture may be observed on the carriage rod, indicating that a purge is in order even though the system has not signalled the need for it. Water in the system will not harm anything, but it will impair the arm's operation and so should be eliminated if it occurs. The instructions for doing this are clear and detailed. In fact, the entire 20-page instruction manual for this system is exemplary in its clarity, literacy, and freedom from typos.

Associated components used for my tests of the Versa Dynamics 2.0 were the Ortofon MC-2000 cartridge with its X-2000 step-up transformer, Threshold FET-10 preamplifier and SA-1 power amplifiers, and Sound Lab A-3 full-range electrostatic speakers. Cartridge tracking force was set to 1.5 grams, with the cartridge body parallel to the disc surface. Interconnects were Monster M-1000 Laboratory Reference series, and the speaker cables were by Straight Wire. Signal sources were from analog discs from Sheffield, Reference Recordings, Wilson Audio, and Opus 3 (the Depth of Image test record), with original 15ips tapes and CDs (from the Stax CDP Quattro and the Sony CDP-650ESD/DAS-703ES combo) used as references.

As soon as I started trying to use the arm, I ran into trouble with my Ortofon cartridge, whose extremely low (0.05mV!) output had made it difficult to get rid of audible hum when I first put it in service. But in this case, hum wasn't the problem; it was a relatively high-pitched tone. It was coming from the drive motor, and seemed to be getting picked up by the loops of unshielded wire connecting the tonearm frame to the headshell. Moderately audible at the highest volume-control settings, this dropped to the edge of audibility at normal listening levels, and was not found to be a nuisance in normal use. It would never be likely to occur with a cartridge having "reasonable" output.

I also found two minor ergonomic vexations. First, the cartridge carrier has such low friction that it is quite difficult to cue a record band with it. With the 'table and arm properly leveled, blowing gently on the carriage was all that was needed to move it, and it came to such a gradual stop, with no visible spring-back, that it was clear that this was about as close to a perfectly frictionless arm as it is possible to produce. It was this lack of friction which made the arm hard to handle. There is no finger lift on the headshell, and there is no convenient edge on which to rest one's wrist while cueing the cartridge. So you push it into
position from the side, at which time inertia takes over and it overshoots the mark. What is needed here is a gentle clutch arrangement for the sliding carriage, which would hold it where you move it to until you lower the lift lever, and would then release it.

Second, there is a need for an outer-groove stop buffer, that would position the cartridge right over a disc's lead-in grooves when you slide it to that end of the rider rod, and hold it there until you lower it. John Bicht is aware of both problems, and suggested rubbing a candle along the underside of the arm lift rod to cure the overshoot problem. This struck me as a very Mickey-Mouse "cure," but it worked... for the time being. His solution to the lack of an outer-groove cue stop? Move the tone-arm slightly closer to the platter, so the cartridge's travel limit will put it right over the lead-in groove. That's not easy to do on an already assembled unit, but he claims it will be done on future production samples.

This is the first time in many years that I can recall hearing what I would describe as a dramatic improvement effected by a turntable or arm. (The last two times were when I first auditioned the Well-Tempered Arm and then, later, the SOTA Star Sapphire with its vacuum-platter upgrade.) But something almost miraculous took place when I installed the Versa Dynamics 2.0 system. Suddenly, LPs no longer sounded like LPs, but like original master tapes! There was no feeling whatsoever of a mechanical stylus tracing a groove; the not-quite-subliminal mistracking that I have always associated with disc reproduction, particularly from inner grooves, seemed to vanish, and what was left had the etched, focused detail of a good first-generation tape. (I recall having a master-tape reaction to the Iverson/Robertson EK-1 strain-gauge pickup system, but in retrospect, that was mostly because the sound had a quality of ease and freedom from, if you will, strain, that I had not previously heard from discs. I would now venture to say that the Iverson pickup, with the associated equipment (ca 1984) sounded like a good 1:1 copy of the master, while the Ortofon in the Versa Dynamics sounds like the original.)

The disc hold-down system is the most effective I've ever come across. This is immediately evident if one locks down a disc and then taps its surface with a fingernail. Instead of the usual click (or clunk, with most vacuum hold-down systems), all you get is a very faint "tuck." With the cartridge on a stationary disc, volume at normal listening level, this fingernail test produces practically no sound. You have to listen carefully in a quiet room to hear anything from the speakers at all. This, it seems to me, renders completely irrelevant the usual design considerations of disc-vibration coupling into the surface and what to do with such energy. With the Versa Dynamics 2.0, the disc surface is, for all intents and purposes, no longer a mechanical (read "resonant") entity. It is dead. This is, theoretically, exactly what it should be, and doubtless contributes mightily to the Versa Dynamics' remarkable performance.

The disc damping is much more effective than that of the SOTA Star, even at the latter's maximum vacuum setting. I have no explanation for this, other than to suggest that the Versa Dynamics may use a higher vacuum than the SOTA (I had no means on hand for measuring them).

Readers may remember some discussions in these pages, in connection with the SOTA Star's adjustable vacuum, about how the amount of vacuum can be used to "tweak" the sound of the disc for "optimum" quality. It is my contention that this is nonsense. In any record player, a resonance is a resonance, and it doesn't belong. Resonances of all kinds, including those of the disc, should not be "tweaked;" they should be eliminated as completely as possible. Thus, the hold-down in the SOTA Star, or in any 'table with an adjustable vacuum, should be set high enough that any additional vacuum has no effect on the fingernail test described above, and so that any decrease in hold-down increases the audibility of resonances from that test. But what, then, about disc damage due to the vacuum's leaching of surface plasticizer?

Some users of the Audio Technica AT-666EX stabilizer, which requires that you evacuate the disc to a high vacuum level prior to playing (so the vacuum will last through the disc side without replenishment), have observed a rapid accretion of ticks and pops on many discs. It has been theorized that this was the result of a loss of plasticizer from the evacuated surface. Versa Dynamics' John Bicht does not believe that. He contends that the surface-noise increase observed by some users of vacuum 'tables is caused, not by conical fracturing as
a result of plasticizer loss, but by surface dust particles which, getting squeezed between the disc and the platter surface, become embedded in the surface of the disc or, at least, leave permanent indentations in it. It is for this reason that Bicht advises using a thin, slightly resilient mat between the disc and the surface of a vacuum platter, and supplies one with each 'table.

Two protective mats came with my sample 'table. One, with a gauzy appearance, is what Versa has been supplying until now. The other, an opaque white mat with the soft, clammy feel of something recently deceased, is an experimental one that Versa has been considering using instead because it seems to provide better disc protection as well as somewhat better sound quality. The gauzy mat has a small center hole and is slightly stiff. Held in place by the small rubber washer normally fitted over the platter spindle (presumably to seal off air leaks at that point), it lies flat on the platter at all times and has no tendency to lift up with a static-charged disc.

The soft white mat, on the other hand, had a large center hole (slightly larger than a disc label) and thus cannot be held down by the spindle washer. To use it, it must first be centered on the platter and then flattened out before you put a disc on. (It has a strong tendency to wrinkle.) Then, when you remove the disc, the mat is just as likely as not to come up with it, requiring careful replacement on the platter before you play the next side. There must, I insisted, be a better way of doing this. (Actually, I found one. I sprayed one side of the white mat with Scotch graphic arts repositional spray adhesive, let it dry completely, and carefully stuck the mat to the platter. It has remained there since, and does seem to give the disc slightly better damping qualities than the gauze mat. But the difference is oh-so-slight!)

Above all, the impression I get from disc reproduction via the Versa Dynamics 2.0 is one of rock-solid stability. No longer do I ever get the feeling that some discs are on the edge of mistracking, although this may in fact be a result of something else I can't explain. On some tracks of the Shure Series V torture test record, which the Ortofon (and every other known cartridge) should in theory be incapable of tracking cleanly, I still couldn't hear any stress from the Ortofon/Versa combo. This might lead one to suspect that the system is obscuring detail, but the unprecedented wealth of detail from other media would seem to lay that doubt to rest.

Along with stability of tracking, there is now markedly improved stability and specificity of imaging. I was not aware of any deficiencies in either of these areas until I heard what this phono unit can do. The difference is unsuble. The unresolved question, though, is how much of this improvement is a result of the turntable and how much is attributable to the arm. I suspect it is both, and more, with that "more" being the fact that the V-D system is fully integrated, with each component carefully mated to the other.

Surface noise is also less obtrusive now than I have ever heard it. Probably as a result of reduced HF ringing in the system, ticks and pops are noticeably reduced in pitch content, and seem to separate out from the music; appearing right at the plane of the loudspeakers, they can be easily ignored during the music, which images behind the speakers.

Bass performance from discs, too, now sets a new standard. The Versa Dynamics, in my system, produced the smoothest, deepest, tightest low end I have ever heard from disc! Bass performance is almost exactly like that from Compact Disc, which is to say it is probably about as natural as it is possible to get. It is now clear that the WTA, which has been accused of thinning deep bass, instead slightly exaggerates the midbass. To the ear, the midbass exaggeration tends to obscure what is below.

In short, this player is giving me by far the best sound from analog discs that I have ever had, and has forced me to revise my feelings about CD relative to LP reproduction. I recently became aware that, during the three weeks I have been using this player, I have not played a single CD. Whether this is because I now prefer LP sound or is simply because my entire LP collection (which contains a lot of unsurpassed performances that may never be on CD) has suddenly been revitalized, is something I'm not prepared to declare because I haven't made up my own mind yet. However, I will admit that I cannot recall when I have derived so much pleasure from so much of my analog disc collection.

Is this, then, the best 'table/arm unit in the world? For my money, yes. I haven't heard the
\$22,350 Goldmund Reference, and obviously can make no final pronouncements, but the Goldmund does have some design features which are, theoretically at least, inferior to the Versa Dynamics'. The Reference could hardly have a better disc-damping system than this, its incrementing carriage feed (constant-speed, and actuated by a position sensor) will inevitably be very slightly off tangency much of the time (whether or not it is audible), and its much longer tonearm (7" from stylus to pivot, as opposed to the Versa's 3") is inevitably more susceptible to longitudinal resonances in the critical midrange region.

The only real problems I foresee with the Versa Dynamics 2.0 would involve isolation of its pump module from the listening environment (and its surrounding area). The frequencies at which the pump produces most of its noise and vibration are low enough that they are unlikely to cause trouble if the pump is on a concrete floor or a low-resonance suspension. But using the system in a frame house could cause real headaches—literally, because floor joists are very efficient transmitters of low-frequency vibrations. Just how much of a hassle this turns out to be will depend on whether or not the structural resonances in a given venue happen to fall on the 40 or 20Hz frequencies. But even if they don't, it would probably only make a difference between the LF noise being clearly audible throughout the house or being positively obnoxious. (Remember that, while 20Hz is at the lower limit of human hearing, it is by no means at the limit of perception, as can be corroborated by anyone who has ever experienced a large pipe organ sounding off at 16Hz. 20Hz can be definitely felt, as a pulsating pressure on the body, and it has been demonstrated that more than a few minutes of such pulsing can cause a headache.)

The optional noise-reduction enclosure has relatively little effect on floor-borne vibration. It would seem, then, that if there isn't a convenient concrete floor on which to place the pump, the pump assembly will need better supporting isolation than it now has. Suspending it from the ceiling on springs is one possible solution. A better one would be to provide adequate isolation through the unit's feet, as by the use of such compression springs as support the turntable suspension.

I would have liked nothing more than to assure you that this \$8000 system is a waste of money unless you're willing to go for broke to get a tiny improvement in sound. Unfortunately, that's not the case. The improvements it effects in LP reproduction are real, significant, and—as far as I'm concerned—well worth the cost. Very highly recommended, with fireworks and fanfares.

**MICRO SEIKI RX-1500 FVG TURNTABLE**

Steve Watkinson

Micro-Seiki RX-1500 turntable

Despite the overwhelming dominance of the Japanese in the "stereo" equipment mass market, their forays into the high end have tended to result in mutual disappointment for both consumer and manufacturer. The two areas of the audiophile market where the Japanese have had success—tonearms and cartridges—only emphasize their failure in the market as a whole. Turntables seem to be a frequently targeted item for Japanese manufacturers attempting to break out of the mid-fi mold and expand into the high end. Both Nakamichi and Denon have offered several supposedly audiophile turntable models in recent years which, despite a number of fancy gimmicks, failed to generate much enthusiasm in the audiophile community.

While Denon, Technics, and several of the other large Japanese companies were developing over-engineered, direct-drive marvels, a few of the smaller Japanese companies, such as Micro Seiki, were doing the same with belt drive. The RX-1500 FVG stands as a testament to these efforts, representing an almost stereotypical example of what Japanese engineers can do when turned loose and told to produce the "ultimate." The 1500 is a massive and gorgeous piece of machinery finished in high-tech black and bronze, which incorporates nearly every feature conventional wisdom suggests is beneficial in a turntable. It has vacuum record clamping, an air-bearing supported platter, provision for mounting multiple tonearms, and an adjustable four-point suspension. The belt drive is powered by a motor in a separate housing which can be isolated from the turntable stand, thus eliminating the possibility that vibrations from the motor might reach the platter. Speaking of the platter, it is a solid-bronze, single-piece casting weighing 9kg (19.8 lbs).

To make sure no vibration is undamped, the suspension employs a combination of coil springs, rubber-diaphragm-supported pistons, compressed air, and high-viscosity oil. As with the Oracle, there is no external chassis or plinth, and the entire arm and platter base assembly is suspended directly from the four leg pillars. The quality of components and machining on the 1500 are clearly first-rate, and one has no doubt where the money goes.

Set-up of the 1500 is something of a feat in itself. Even with the assistance of two fellow audiophiles (who happen to be employed as an engineer and a service technician at a large computer manufacturer), and detailed instructions from the importer, unpacking and set-up (including mounting the tonearm and cartridge) took between three and four hours. The complete unit weighs over 100 lbs, came in three boxes, and there seemed to be enough parts to assemble a base-model Yugo. Unless you're a mechanically inclined masochist, leave the set-up to the dealer. Most dealers will (and should) provide free in-home set-up of a turntable in this price range.

The RX-1500 also has some strange ergonomic quirks. First, despite the use of three separate pneumatic lines, the vacuum system is completely manual, requiring a separate switch to be activated on the pump unit to start and stop the vacuum. A manually activated vacuum system can offer certain advantages, as critics of SOTA's automatic system have noted: allowing one to change records with the 'table running, which reduces stress and wear on the belt and drive motor. Had such been the case with the 1500, I would not have made this criticism. However, the motor for the vacuum pump also powers the air bearing which supports the platter. Thus, the platter won't turn unless the vacuum is on, and both switches have to be turned off and then back on every time the record is changed. Also, the vacuum suction level is not adjustable. Although I've noticed no deterioration to my record collection which could be blamed on excessive suction from the 1500, the vacuum level seems considerably higher than what I normally use on my reference SOTA Star.

Mounting the tonearm is also more complex than usual. The armboard is mounted on the suspension pillar, of which there are several, allowing multiple arms to be mounted. However, this "one-point" mounting system, which leaves the arm cantilevered out over the side of the 'table, means the armboard must be pivoted into the proper position by measuring the overhang at the spindle, then tightened.
down without changing the armboard's position. A neat trick which generally took several tries to pull off. Although inconvenient, it seems to be a reasonable price to pay for the ability to mount multiple arms.

I initially tried the RX-1500 with the SAEC WE-8000/ST transcription arm and High-Phonic cartridge recommended by the importer. The results were, to say the least, disappointing, and it took several weeks of futzing to obtain anything approaching decent sound. Changing the tonearm to the SME Series V and another week or two of futzing made a considerable difference; at last I was able to obtain sound quality that deserved the label "audiophile." All further descriptions of the RX-1500's sound quality are based on listening with the SME arm, unless otherwise noted. Other equipment used included the Kiseki Purple Heart Sapphire and Virtuoso DT1 cartridges, the Klyne SK-5A and Electrocompaniet EC-1 preamps, the BEL 2002, Eagle 2, and Nestorovic amplifiers, and Magnepan Timpani 1Va speakers.

At its best, the RX-1500 produced a reasonably high-quality sound which, not surprisingly, exhibited many of the virtues I noted in the vacuum SOTA (see my review in Vol.7 No.2). These include an extremely high level of fine detail, excellent image stability and depth of soundstage, and a sense of purity and transparency that I've only heard from 'tables using a vacuum system. The massive platter gave a stability to the pitch which, with the right belt material, is about on a par with the SOTA with the electronic flywheel, and better the SOTA without the flywheel. The 1500 is supplied with three different belts, two rubber flat belts and an aramid (as used in tires) cord. I was surprised how much of a difference a change in belts made in the sound. The aramid belt was by far the best, and offered much better stability on sustained notes. However, as suggested by the importer, plain cotton button thread proved to be the best material of all.

On the negative side, the soundstage was not as wide as what I obtain with my reference 'table, and the overall sound is slightly dull and lacking in drive, except in the upper midrange/lower treble, which is somewhat hard and forward. These basic characteristics came through with each of the three cartridges used, and regardless of the other components comprising the system. The sense of dullness is most noticeable in the upper bass and lower midrange with percussion instruments. This literally took some of the drive out of pop music. The high frequencies also seemed to lack some sparkle, luster, and subtlety in comparison to my reference 'table. Upper harmonics did not seem as well extended. Mid- and low bass were tight, though a bit down in level. Although attacks were sharp and clean, they lacked impact.

I suspect some of the upper-midrange hardness is attributable to the lack of a mat. The record is sucked down directly onto the bronze platter. I was unable to experiment with different mats on the 1500, since a mat would block the vacuum suction holes, but I would not be surprised if a decent mat would eliminate many of this 'table's faults.

On first impression, the sound is somewhat reminiscent of early CD, with less dynamics and more detail. But on examination of the finer points of the music, the RX-1500 does fare considerably better than early CD. Harmonic and tonal contrasts were well preserved, and the tones of a woodwind instrument running up or down the scale are remarkably accurate. Despite being somewhat narrow, the stability and depth of the soundstage make for a very convincing image. There is less ambience around the individual instruments and voices than I believe there should be, and this makes all recording settings sound somewhat anechoic at first. But it's surprising how well the ear adjusts to this. After a few days' listening, the ambience seemed close to natural.

In summation, the RX-1500 is a well-built, visually attractive 'table that can produce audiophile-quality sound. Like the Oracle, it is the type of unit that will impress non-audiophiles, and may even appeal to your decorator. However, to my tastes the sound was somewhat dull and lacking in drive. I also find the elevated presence region somewhat distracting.

So, for twice the price of the SOTA Star or four times the price of a Linn, you can have a turntable not quite as good as the SOTA and maybe a little better than the Linn. That's a lot to pay for the admittedly impressive visual aesthetics. The RX-1500 is the type of product that distinguishes between the true audiophile and the yuppie technofreak. In a sense, it provides a valuable service: the yuppie can at least
enjoy audiophile-quality sound. This is more than the high-tech direct-drive turntable wonders from the large Japanese manufacturers allow.

**AUDIO RESEARCH SP9 PREAMPLIFIER**

J. Gordon Holt

Audio Research SP9 preamp

Hybrid (tube/FET) stereo preamplifier. Inputs: Phono, CD, Tuner, Video, Spare, Tape 1, Tape 2. Outputs: Main, Tape 1, Tape 2. Frequency response: 30Hz-40kHz +0.3dB (phono), 5Hz-50kHz +0.5dB (line). Distortion: less than 0.01% at 2V RMS output (typically less than 0.005% in the midband). Noise: -98dB ref. 5V RMS output, greater than -100dB ref. 1V RMS output (line), -78dB ref. 1mV input (phono). Gain: 66dB (phono), 20dB (line). Maximum input level: 200mV at 1kHz, 1V at 10kHz (phono), infinite (line). Input impedance: 47k ohms (phono, user adjustable), 50k ohms (line). Output impedance: 500 ohms (main output), 850 ohms (tape output). Recommended load: 60 k ohms/100pF (20 k ohms minimum; 1000pF maximum). Output level: 2V RMS, 5Hz-50kHz, all outputs into 60k ohms (maximum from main output, 50V RMS at 0.5% THD at 1kHz into 100k ohms with 5V RMS into high-level input. Dimensions: 19" W by 5¼" H by 12¾" D (inc. handles and rear fittings). Weight: 13 lbs. Price: $1695. Approximate number of dealers: 55. Manufacturer: Audio Research Corporation, 6801 Shingle Creek Parkway, Minneapolis, MN 55430. Tel: (612) 566-7570.

Following the introduction of their very expensive, tube/FET hybrid SP-11 preamplifier, there were rumors that Audio Research was working on a hybrid tube/transistor preamplifier targeted to cost less than $2000. The rumors were confirmed when ARC showed a black-and-white photo of the SP9 at the '87 Winter CES. Obviously, like all magazines, we were impatient to receive a review sample, but the first review of the SP9 actually appeared in the summer '87 issue of Peter Moncrieff's *IAR Hotline*. Peter's review was almost in-temperately enthusiastic, comparing the SP9 positively with early samples of the SP-11 and suggesting that its sound quality was considerably better than would be expected from its $1695 asking price. Naturally, we were anticipating good things when our review sample arrived in Santa Fe in late July.

Like most other ARC watchers, I had assumed the SP9 would be a stripped-down version of the highly regarded $5000 SP-11. And in the sense that it is rather more restrained in concept than the '11, it is just that. The one-piece unit (no separate power supply) has four knobs and four toggle switches vs the SP-11's six and eight, respectively. There is only one volume control (vs the '11's two), but since it is located in the circuit right after the high-level inputs, there's no possibility of input-signal overload regardless of how strong the signal. ARC, however, denies that the 9 is a "stripped-down SP-11," preferring to describe it as "an adaptation of some of the SP-11's patented hybrid technology."

Well, it is and it isn't. Both are hybrid units,
in that both have tubes and transistors in the signal path, but those components are combined rather differently in the two preamps.

In the SP-11, each signal "stage" consists of a FET and a tube in a cascode configuration. This arrangement plays off the operating characteristics of both devices against each other, resulting in a combined performance better than either the FET or the tube on their own. The characteristic curve of an amplifying device is a graph which plots its through-current against the input voltage applied to its control gate (or grid). Ideally, through-current should be an exact function of input voltage, producing a characteristic "curve" that is a straight, diagonal line. In actuality, though, this "line" is more like a curve, with its ends fairly sharply curved and its middle section approaching but never quite becoming a straight line. Classic design practice has been to place the device's operating parameters on that mid-part of the line that has the least curvature, as this yields the lowest distortion. But because the line is never completely straight, the distortion is never zero.

The characteristic curves for a tube and a FET are interesting in that they are almost exact mirror images of each other: while one tends to curve in one direction, the other tends to curve in the other direction. Combining both devices into what is essentially a single amplifying stage has the effect of cancelling the curvatures of both, resulting in an almost perfectly straight transfer characteristic and, of course, vanishingly low distortion.1 Also worth noting is that the tubes in this kind of hybrid circuit are run in what's sometimes called "trickle mode." That is, their plate current is much lower than is usual for a tube, resulting in a product whose top panel, even after four hours' use, is barely warm to the touch. This means you don't have to give an SP-11 (or the '9) as much ventilation space as is necessary with conventional tube preamps. It also means you can expect unusually extended tube life—ARC claims up to 10,000 hours of service life will be possible from the SP9 tubes!

By critical consensus, the SP-11 is the best-sounding tube preamp Audio Research has ever made; certainly it has few, if any, peers. This is not that surprising, given that ARC has never made a less-than-excellent tube product, and that the hybrid cascode design should, in theory, be better than one with tubes alone. The SP9, however, features a rather different circuit topology. Almost identical gain blocks are used for both phono and line stages, the latter being less complicated, however, as it doesn't need as much gain, nor does it apply RIAA equalization. According to the supplied schematic, the circuitry is single-ended, operating from a single high-voltage rail. The input signal is applied to the gate of an n-channel FET, the drain of which is connected in a classic cascode manner to the grid of half of a 6dJ8 (ECC88) dual triode, biased by a resistive divider. In the phono stage, the plate (anode) of this tube feeds a pair of MOSFETs for additional gain, followed, like the line stage, by a MOSFET output driver, this AC-coupled to the volume control (phono) or main output (line). The output stage has a total of 20dB gain (a wire link on the board can be easily desoldered to lower the gain to 14dB, for use with more sensitive power amplifiers) with a single feedback loop around the FETS and tube. The phono stage has two overall loops, one AC, one DC, to provide the RIAA equalization. Components used are very high quality.

As with all ARC amplifiers, the power supply is sophisticated, with separately regulated supplies feeding the phono stage, the output stage, and the timing and muting circuitry. Power MOSFETs are used as the series pass elements. The transformer itself is a high-quality, electrostatically shielded toroidal type, fixed to the rear of the LH sidewall as far away from the phono circuitry as possible.

All the input and output sockets are gold-plated Tiffanys and the SP9 has inputs for four line-level inputs—Video sound, CD, tuner, and spare—in addition to inputs and outputs for two tape recorders. The phono input is nominally moving-magnet compatible; its very low noise makes it suitable for MCs with not too low an output and an internal resistor can be changed to lower the loading for MC cartridges. Input capacitance can also be changed appropriately. Upon turn-on, a timing circuit mutes the output for 45s, allowing the operating points to stabilize; the muting is performed with a relay which pulls the output to ground—the signal only flows through the potentially sound-degrading relay contacts when there is no sound!—a series resistor

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1 This hybridizing technique was first used in a similar but patented circuit by David Berning ten years ago in his T-10 preamplifier. (You can guess what the T and the F stood for.)

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prevents excessive current flow through the output MOSFET when muted.

Before auditioning, I allowed the SP9 to warm up for a day or so, something I have found to be absolutely necessary before any new product will perform up to snuff. Other components used for my tests were the SOTA Star Sapphire turntable (with Electronic Flywheel), the Well-Tempered Arm, an Ortofon MC-2000 cartridge with its X-2000 step-up transformer, Threshold SA-1 power amplifiers, and Sound Lab A-3 full-range electrostatic speakers. Interconnects were the new Monster M-1000 Laboratory Reference series, and the speaker cables were by Straight Wire. Signal sources were from original 15ips tapes, CDs (from the Sony CDP-650ESD/DAS-703ES combo), and analog discs from Sheffield, Reference Recordings, Wilson Audio, and Opus 3 (the Depth of Image test record).

On first listen, using high-level sources only, I am saddened to report that the sound was not good. In fact, it was hard, rough, thin, and both spatially and dynamically compressed. The phono preamp added more of the same of everything. The adjectives I used above—and I gave considerable thought to their choice—do not reflect merely personal value judgments on my part, but are descriptive of the changes wrought by the SP9 on signals passing through it. That is, they were audible on simple bypass tests, in which the preamp under test is compared with the signal being fed to it. My system, straight-through from high-level source to speakers, is, if anything, a bit on the warm side, so my complaints about the SP9 are actually giving the preamp some benefit of what doubt there may be. With a more neutral system than mine, the SP9’s irritations would be exacerbated, not mitigated. In addition, confirming what David Prakel had said in his review of the SP9 in the September 1987 issue of Hi-Fi Answers, cross-talk between line-level inputs was higher than I would have liked. If a tuner is operating while a disc is being played, its signal will be faintly heard in the background.

In their literature, ARC warns that the SP9 needs to see quite a high amplifier load impedance: 60k in parallel with 100pF is recommended, the capacitance being very low, equivalent to no more than 2 meters or so of a typical audiophile interconnect. The worst-case loading is 20k in parallel with 1000pF, this still not unusual with many solid-state power amplifiers connected via reasonably long interconnects. Worried that I might have been mistreating the preamp’s output stages, I checked my cabling: the 1m length of Monster M1000 had a total capacitance of 175pF, while the 75k input impedance of the Threshold SA-1 should not have presented the SP9 with any problems.

I was then told that according to Ken Kessler, who was reviewing the SP9 for HFN/RR, the SP9 needed “at least 72 hours of warm-up before its sound reached its best.” JA took our sample SP9 home and tried that (see below), then suggested I go forth and do likewise.

After four days of continuous warmup (96 hours), I was prepared to modify my initial response to the SP9’s sound, but only to the extent of putting the word “somewhat” ahead of each of the adjectives I had used previously. I still found the preamp to be one of the least ingratiating I had heard in years. But why, I wondered, did it sound so completely different from the SP-11, in which ARC’s “patented hybrid technology” had worked such sonic wonders?

The answer may lie in the fact that the SP9 combines its tubes and FETs in a cascade, rather than cascode, configuration. The difference is that, whereas the latter allows both devices to act as a single stage, the former normally makes them behave like two separate series-connected stages. Thus, instead of canceling their inherent distortion characteristics, the two sets of distortions would be added. That still wouldn’t explain why the ’9 sounded mediocre; ARC used cascading in its all-tube preamps, and they sounded warm and sweet rather than thin and rough. But it might explain the differences between ARC’s two hybrid designs. (If, in fact, there is some other provision in the SP9’s circuitry that would make it behave differently from the way I think it does, I would be interested to learn about it.)

The SP9—my sample, anyway—is not what I would call a bad preamp. Its problems are really only moderate in degree. But most are errors of commission rather than omission, and are of a kind I personally find very hard to tolerate. But what’s a better preamp, for the price? Or even as good? Well, $1700 is a popular price range for preamps, and solid-state design and available materials (like active
devices) have reached a point where some transistor designs are comparable in performance to tubed units costing several times as much. Unfortunately, I haven't heard any of the current solid-state models in this price range. But I am very familiar with a $1500 tube preamp from a competing firm: the Conrad-Johnson PV-5.

A three-year-old design (although probably improved since the one we have on hand was loaned by the manufacturer), this has long been almost a cult favorite with audiophiles who dote on the classic "tube sound." To refresh my memory of it, I brought home our PV-5 from the office and gave it three days to warm up before listening to it. The sound was much as I had remembered, but the increasing accuracy of other, more recent, preamplifier designs has rendered its previously "slight" colorations more conspicuous by comparison. Through any high-level input, its sound is warm and rich, with a soft but subtly grainy high end, a slightly forward upper midrange, an almost fat and somewhat ill-defined midbass region, and a marked lack of really deep low end. Its soundstage is wide, its rendition of depth so marked as to seem almost exaggerated. Phono-stage performance is relatively free from coloration, adding only a trace more midbass bloom and a slight high-end roughness to what was heard through the high-level section, but, of course, it will not handle MC cartridges with insufficiently low noise. In other words, the PV-5 is a far cry from the idealized straight wire with gain. It's not a very accurate preamp—probably not as accurate as the SP9—but the nature of its imperfections is completely different. Whereas I had been actively irritated by the SP9, I had the opposite reaction to the PV-5. Yes, the PV-5 was drying up highs and losing deep bottom, making everything sound fat and rich, but these were faults I could have lived with even while acknowledging their existence.

Given the choice between these, there is no question which I would buy. A more intriguing question, though, is why my sample SP9 was apparently so different from the samples reviewed by Peter Moncrieff, and by David Prakel and Ken Kessler in the UK. I would like to think that the "Stereophile" sample was, in fact, not typical of average off-the-line production, although I find it hard to believe a firm as conscientious as Audio Research would allow anything sounding like this to leave the factory, let alone go to a high-end magazine for testing. The fact that they did, though, is reason enough for us to publish this review: to alert Audio Research SP9 buyers that at least some samples in stores may not be up to ARC's usual quality standards.

John Atkinson adds a few words:

Worried by JGH's findings on the sound of the SP9, I borrowed the unit from him and installed it in my own system, letting it warm up for a total of five days before attempting any listening. It was used first as a conventional preamplifier, taking the output of Linn Troika and Koetsu Red MC cartridges and feeding my Krell KSA-50 power amplifier (which has an input impedance a bit on the low side at 20k), first via 3m of Monster Interlink Reference (total capacitance 450pF), then via 5m of Radio Shack 300 ohm aerial cable (total capacitance 150pF). In a second series of listening tests, the SP9's line stage, set for as near unity gain as possible, was inserted into my SP10 II's tape loop via 1m of Siltech 4/24 and 1m of Monster M1000.

Unfortunately, my findings were much as JGH has reported: the sound on initial switch-on was not good, being hard and bright. After the long warm-up, while much better, the SP9 was still brighter and drier than the SP10, with noticeable reductions in both image depth and the "roundness" of the imaging. The added hardness to the sound made music less enjoyable. I sat LA in my listening chair and operated the SP10's tape monitor switch; he, too, heard what JGH had reported concerning the sound of the SP9's line stage.

How important is the SP9's shortfall in absolute sound quality when its affordable price is taken into consideration? Unlike JGH, I don't prefer the signature of the PV5 to that of the 9; both provide a level of sound quality below that required by my expensive tastes. In the context of a simple passive preamplifier, however, the line stage of the SP9 is still not as neutral as I would like, negating to some extent the value of the excellent switching provided.

As a long-term Audio Research fan, I have to admit that the SP9 proved to be a disappointment. How then, does "Stereophile" ex-
plain the discrepancy between its findings and Peter Moncrieff's almost immoderately positive review? I do what audiophiles should always do: be true to what you hear, not to what you think you ought to hear. Meanwhile, we will obtain a second SP9 to investigate the possibility that we had a sub-standard sample. Audition the SP9 with care.

**Postscript**

JGH having written the review and JA having prepared it for typesetting, the two then set off for England to visit London's Heathrow Penta hi-fi show, organized by *Hi-Fi News & Record Review* magazine (full report next month). In the meantime, however, as is Stereophile's practice, a copy of the edited review was sent to the manufacturer so that they could submit a comment to appear in the same issue of the magazine. As you can see from Terry Dorn's letter on page 184, Audio Research was both a little hurt and puzzled by the negative tone of the review, and when JGH and JA arrived in London, word of this reaction had already reached the UK audiophile community ahead of them.

Despite discussions at the show with reviewers Ken Kessler and Martin Colloms, who had praised the SP9 in the October 1987 issue of *HFN/RR*, and with Ricardo Franassovici (RF), the UK Audio Research distributor and a keen-eared audiophile, we continued to feel that our sample had not achieved the level of performance to be expected from a product bearing the Audio Research name. A working hypothesis was put forward that our review sample had not been up to specification; this was scotched, however, when we learned that Audio Research had checked it out and found it to measure and sound as specified. "OK," said RF, "I'll set up a listening comparison between the SP9 and SP11 here in one of my suites at the show so that you can demonstrate to us what you feel to be the SP9's sonic shortcomings."

Accordingly, a group of bleary-eyed people—LA, JA, and JGH had partied a bit the night before—gathered in RF's suite at the cruelly early hour of 9am on the final day of the show. A system had been set up which, it was felt, would reveal the differences. A Goldmund Mimesis 3 amplifier fed a pair of Magnepan's new MG2.5 loudspeakers; signal source was a Kinetics CD-30 CD player; and the line stage of either preamplifier could be connected to the power amplifier via Randall Research interconnects with levels matched to within 0.1dB (this done by using the 400Hz test tone on the *HFN/RR* test CD and a hand-held Fluke multimeter). Initially, it had been intended to use a Counterpoint SA-11 line preamplifier to buffer the preamps from the power amplifier and provide an immediate switched A/B comparison, but this was felt to obscure the differences. Accordingly, the more clumsy method of physically plugging and unplugging the preamplifier cables each time was adopted. Initially, the listening was quite informal: JGH, JA, and LA would request operator Paul Crook to play a track either through the SP11 or SP9, and would then comment on the resultant sound. After 30 minutes or so of comparisons, the Stereophile team felt that the audible differences between the two preamps were pretty much as expected from their Santa Fe listening, though JGH commented that the drop in quality from '11 to '9 was not as great in the high frequencies as he had anticipated. A healthy argument ensued, along the lines of, "Well, of course the '9 doesn't sound as good as the '11 but it represents a good taste of true high-end sound at the price," though no agreement was reached as to whether this was true or not.

"Well, if you cannot be convinced," said RF, "how about taking part in a blind listening test?" LA laughed, finding it amusing that whenever a difference of opinion over subjective quality cannot be resolved, it is always the manufacturer or distributor, who wouldn't dream of assessing products in this way for his own purposes, who suddenly develops faith in the infallibility of blind testing. JGH and JA, however, felt that while the circumstances were hardly ideal—unfamiliar components, unfamiliar room acoustics, and the stress of having the person organizing the test, who had a vested interest in a null result being produced, present in the room—it would only be fair to Audio Research to put their strongly negative feelings to the test.

Accordingly, a piece of music was chosen—a passage from the Dutoit Decca/London Berlioz *Symphonie Fantastique*, if memory serves correctly—and was played four times, the order of preamps being chosen by Paul Crook and, naturally, not known to the listeners. The results were as follows:

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It can be seen that JGH scored 0/4, and JA 2/4, the latter the result that would be obtained by chance alone. It would seem that *Stereophile* cannot support its opinions under blind conditions and that Audio Research’s faith in their product is vindicated.

Wait a minute, however. Consider JGH’s scoring: 0% identification is as statistically significant as 100%; both are extremely unlikely to happen by chance. Examined on a more rigorous basis, JGH’s results indicate that he did hear a difference between the two preamplifiers, as he correctly identified every time there was a change; under the blind listening conditions, however, his value judgments were turned upside-down, with the SP11 being identified as the ‘9 and vice versa, something that is not unusual in blind tests. JGH stated at the time of the test that he was getting mixed cues from the two preamps: the thinness in the ‘9’s bass compared with the ‘11 in his own room and system had metamorphosed in the unfamiliar listening test conditions into a more natural balance for the ‘9 and an excessive and somewhat “drummy” bass from the ‘11.

Certainly, it is incontrovertible that a difference was heard, but whether it was one of character, as RF strongly felt, or of quality, as JA and JGH felt, is not proved either way. In fact, proving anything at all from blind testing is extremely hard—which is why *Stereophile* does not test equipment in this manner. Again, with respect to the SP9’s sound, or lack of it, we urge you to audition it for yourself.

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**DON J. COCHRAN DELTA-MODE POWER AMPLIFIER**

Dick Olsher


No doubt about it, the Delta Mode amplifier is an original—both technically and aesthetically. The first visual impression is of modest-sized monoblocks, not at all the behemoth presence you’d expect at the asking price. And at 58 pounds for the pair, neither do they possess the hernia-inducing heft of a class-A amp like the Krell KSA-100. In fact, sited next to the Krell, the Cochran amps appear to be quite underwhelming, and have led to more than a few eyebrows being raised when their price is revealed. They simply don’t have $10,000 worth of perceived value. I should hasten to add that, in hindsight, this is definitely a case of David vs Goliath, though you’ll have to stay tuned to the happy end to find out just how convincing is little David’s victory.

The Cochran amp makes up most of the ground lost in the area of perceived value by scoring highly in the category of perceived charm. Its most striking cosmetic feature is the mirror-imaged physical construction. The amps are constructed as a right-left pair, which allows them to be neatly fastened together for rack mounting. This means, of course, that the heatsinks are located on opposite sides. The mirror-imaging is more than skin deep, and extends beyond external cosmetics to the internal configuration of the circuit boards and power supply; a factor that probably fails to contribute sonically but certainly enhances the amplifier’s charm.

There’s much to extol here in the area of technical originality. As the “Delta” name implies, the amp is fully differential in operation.
from input to output. In the world of engineering compromises, it is seldom possible to find a single “best compromise.” The differential amplifier—also known as “balanced” or “symmetrical”—may be it. Instead of providing a passive-signal, or common, ground, which typically sinks stray currents from such sources as power supplies and filter and decoupling stages, the Delta Mode topology consists of two active balanced paths that produce equal but opposite polarity signals. The major benefits of this design are that non-linearities in one signal are cancelled by the opposing signal path, and that output currents flow only through the load, the output devices, and power supplies—but not through a common ground, which can produce “ground loop” problems in the signal path. This sort of circuit is expensive to execute properly. Obviously, more components are required. But the performance of the circuit depends critically upon pairs of closely matched MOSFETs, and we all know that anything in matched pairs costs a significant premium. Incidentally, the closer the match, the better the performance will be.

The Cochran amp is a hybrid design using a tube input stage for voltage amplification and a MOSFET output stage for current amplification. The goal of such a technological amalgam is to retain the virtues of tube sound without incurring the penalties imposed by a tube output stage. The Achilles heel of the traditional tube amp is, of course, the output transformer. In order to improve low-frequency performance, the size of the transformer must be large, avoiding core saturation and allowing higher voltage swings. Unfortunately, the larger the transformer becomes, the larger the leakage inductance and distributed capacitance of the windings, which limits the high-frequency response.

The output impedance of a tube output stage is fairly high compared with that of a solid-state design, and that reduces the damping factor and bass control. Finally, low-impedance dynamic speaker loads give tube amps fits because of the latter’s inadequate current-drive capability. Tube amps may then be said to typically lack bass control and impact. Thus a hybrid amp utilizing power transistors in the output stage attempts to retain the solid bass and current-drive capability of the all-solid-state design, while hopefully retaining the liquidity of harmonic textures and dimensionality of the anachronistic tube. Reverse or “Polish”-type hybrids have also been produced commercially. These feature a solid-state input stage and a tube output stage, an approach I, for one, cannot rationally defend. A caveat is in order here, because sometimes the hybrid’s promise remains nothing more than a failed genetic experiment. What can happen is the worst of both worlds: the tubey colorations of the input stage compete for dominance with the residual transistor hardness and grain. A sorry bastard indeed! I will not name models now, but hybrids have left me cold in the past. The fact that the Cochran succeeds is all the more impressive.

Technical Details

The inputs of the Delta Mode amp are actively buffered. Isolation is provided by directly coupling each side of the balanced floating input to the grids of a 12AT7 dual-triode tube operated as a cathode follower. An interesting wrinkle involves the use of a semiconductor constant-current diode instead of a resistor as a load for the cathode follower. The cathode followers drive five-position passive attenuators that reduce voltage gain in 6dB steps. Switch settings of 0, -6, -12, -18, and -24dB are available. At a setting of 0dB the voltage gain is 25dB. Negative feedback is added to the attenuator outputs, and the summed signal is used to drive a differential voltage amplifier consisting of a cascaded pair of direct-coupled twin-triode tubes (12AT7 and 12AU7). The voltage amplifier output is AC-coupled to the current amplifier, each phase of which consists of a pair of complementary N-channel and P-channel power MOSFETs operating in source-follower mode. The source-follower configuration is analogous to that of an emitter follower for bipolar transistors, and offers similar advantages: high input impedance, unity voltage gain, and a low output impedance.

The output of the amplifier is obtained between the two phases such that the output terminals are driven equally, but in opposite phase. The power supply for the current amplifier features a 625VA toroidal transformer. An independent transformer and power supply are used for the front end of the amp.

Both direct and filtered outputs are provided. Like other amps using negative feedback, the Delta Mode amp is vulnerable to ultrasonic
oscillations with highly capacitive loads, due to the latching voltage phase shift with increasing frequency in such loads. Conventionally, a small choke in series with the output provides a well-defined filter pole with this capacitance, isolating the feedback amplifier from its adverse effects. A circuit is provided across the Cochran's direct outputs that senses large ultrasonic or RF oscillations above about 40kHz. An LED on the back panel warns the user of such instabilities, at which point you're to switch to the low-pass filtered outputs (about 1dB down at 150kHz).

Output load protection is provided via fuses in the 60V rails of the output section so that the fuses are not in the signal path. Over-temperature protection is provided by a circuit that monitors the heatsink temperature. When this reaches about 225°F, the thermostat relay drops out the current amplifier rails and lights a red LED on the front panel. Power is returned when the heatsinks cool down to 195°F. The use of power MOSFETs means that the output stage has a negative temperature coefficient, eliminating the potential for thermal runaway common with bipolar output stages.

Part and construction qualities are very high. The PC boards are double-sided, FR-4 grade, glass epoxy with 2oz. copper traces. The signal board includes a ground plane on the component side for electrostatic shielding. The ground plane in turn is connected to the power-supply common. The wiring used for all signal-path and power-supply wiring is unplated OFHC. There are more audiophile touches: all solder used is “Wonder Solder;” the coupling and bypass capacitors are “Wonder Caps;” while all resistors are type “MK” metal-films from Roederstein. All of the above reflect the sophistication of this amplifier and the commitment of its designer, Don Cochran, toward achieving a state-of-the-art product.

Since the Delta Mode outputs float, without a common or ground connection, they must remain isolated. This is explained in the owner’s manual, but is very important and limits the potential applications of this amp. For example, this amp will not work with a speaker system incorporating a summation-bass subwoofer because such a configuration requires common amplifier grounds. Neither is it suitable for bi-wiring speakers whose crossover network have common grounds—that is to say, most speakers, since crossovers have common grounds. This I discovered while attempting to bi-wire a pair of Apogee Calipers. The Cochran amps hummed and oscillated like crazy.

**Listening Impressions**

Let me first deal with the first sample I received. Initially, my impressions were of startling midrange purity and remarkable resolution of low-level detail, but with an overriding tonal balance coloration. The treble was leaden, dull, and recessed—all of which served to emphasize the mids. There was also a grainy and slightly dry flavor to the extreme highs. The character of the sound was reminiscent of the sound of spent tubes. This was simply speculation on my part; I wasn't really willing to believe it, considering that the driver-stage tubes were RAM computer-tested industrial grade. I brought up this possibility with Don Cochran. To settle the issue, he immediately sent me a second pair of amplifiers to evaluate. These sounded much improved in the treble.

It seemed reasonable then to reevaluate the first pair with a different tube complement. I substituted off-the-shelf Amperex tubes in the voltage amplifier section (tubes V2 and V3), but left the original cathode-follower tube alone, partly because this last is not a gain stage and should therefore have minimal effect on sound quality, and partly because it's so darn difficult to reach. (It is necessary to remove the bottom plate and a carload of hardware in order to get a comfortable hand grip on it.) Surprise! The tonal balance and treble quality of the first pair improved dramatically. If anything, I slightly preferred the sound of the Amperex tubes to that of the RAMs, the treble being slightly better defined.

This experiment brought up the issue of optimum tube brand. Apparently, Cochran had not experimented with different brands and had settled on Roger Modjeski's RAM tubes as a convenience. Don agreed to send me several sets of tubes to experiment with. What I received were Gold Aero “Gold” and “Platinum” tubes, and RAM's “SS” grade tubes, their best. What follows are my assessments of the sonic merits of these various tubes. These listening tests were done with my rejuvenated Quad ESLs (Koval modded) and the Threshold FET-10 preamp. Program material
consisted of master tapes of my lovely spouse's soprano voice (what I've dubbed the Lesley Test). Again, only V2 and V3 were replaced, and the bias and balance pots were adjusted per Cochran's instructions following each tube substitution.

First, the stock RAM tubes: the treble is still too recessed; transients are somewhat dull; mids lack the ultimate in immediacy and transparency; harmonic textures are slightly dry and grainy; and timbre accuracy is slightly off in the upper registers of Lesley's voice. With the Gold Aero "Golds," the upper octaves are smoother and sweeter, treble transients are too soft, and there's a better—but not perfect—balance between the treble and mids. Next, the RAM "SS" tubes: The sound is nicely integrated, top to bottom, with improved spatial resolution when compared with the "Golds," but is not quite their equal in terms of liquidity. Treble transients are better yet, being quick and incisive; timbre accuracy is excellent. Finally, the Gold Aero "Platinum" tubes: Yeah! These are it! There's clarity and purity galore. The mids and highs are transparent, cohesive, and liquid, and the treble is both quick and detailed. There was a decided family resemblance between the Golds and the Platinums, with both possessing a liquid transparent character. But the Platinums are much better on top and go much farther in the areas of clarity and purity of timbre. So my first choice ended up as the Platinums with the RAM "SS" as a distant second. After I settled on which tubes to use, I went ahead and also replaced V1—the cathode follower—with a Platinum. The change was small but worthwhile, with the upper octaves cleaner yet, and the overall soundstage slightly more alive. Please do not take the above tube ranking as being universally valid; it may only apply in this specific context.

In any event, with the Platinum tube complement, the Delta Mode amp was a clear winner on the Lesley test, eclipsing the Threshold SA-1 amplifier. While the Threshold is just as clean through the upper registers, it is not as liquid and natural.

The impression of exceptional performance—even in the context of Class A—persisted throughout my analog listening session. Let me cite a few specific examples: Cleo Laine's voice (Live at Carnegie Hall, RCA LPL1-5015) was superbly focused, with every nuance perfectly resolved. There was a suave, effortless quality to the sonic presentation, with liquid mids and treble that was quick, crisp, and well controlled without any aggressive tendencies. On Sheffield Lab 3, The King James Version, the impression persisted of lots of detail, and of midrange purity and smoothness. The midbass was very tight, but the drums had lost some of their punch and impact. Slight losses in bite and drive through the presence region were also noted. Brass had lost some power and conviction. A slight loss of spaciousness at the extreme treble was also noted.

Opus 3's Test Record I provided the Cochrans a chance to really strut their stuff. The soundstaging was consistently excellent, with a realistic depth perspective and width dimension. Imaging specificity or focus within the soundstage was reproduced about as well as any tube amp has managed on the Quads. Therese Juel's voice (cut A1) was reproduced with almost palpable focus and with very natural sibilants. On cut A2, the guitars were precisely placed and readily resolvable spatially. The warm tonality of the double bass on cut A3 was just about perfectly captured. At this point, after about two hours of on time, I noticed an improvement in the reproduced treble quality which left me very little to criticize. And how about that lovely exchange between piccolo and flute on cut A5? I could not fault it on any count. On cut A6, the bongos and gourd were clearly placed where they should be: forward of the pan pipes. The chorus on cut B3 was beautifully spread out across the soundstage with lots of dynamic bloom, while retaining excellent specificity of individual voices. A couple of strong sopranos were easily resolved on the left side of the stage.

On to Wilson Audio's recording of the Beethoven Sonata for Piano and Violin. David Abel's Guarnerius sang sweetly and with great focus. In fact, it's never sounded better. String overtones were consistently reproduced with wonderful timbre accuracy, and as a matter of fact, timbre accuracy was generally right on. The brightness and upper-octave artificiality on Amanda McBroom's Dreaming (the Monster Cable release) was clearly revealed. How about all that artificial reverb on "Ship in a Bottle"? The Cochrans reveal all! I could go on and on, but I won't. Suffice it to say that I found...
these amps consistently involving and faithful to the program source.

In order to get an additional data point, I luggered the amps to JGH's listening room in order to try them out on his current reference system. At the moment, this consists of the Sound Lab A3 speakers, Versa Dynamics model 2.0 'table and air-bearing tonearm, Ortofon MC-2000 cartridge and step-up transformer, and Threshold FET-10 preamp. I was able to compare the performance of the Delta Mode amps in this system with that of the Threshold SA-1s and the Krell KSA-100 amps. The overall sound of Gordon's system is big, dynamic, detailed, and capable of excellent imaging with the right program material. Deep bass is slightly missing in action, and the Ortofon cartridge occasionally mistracks, but it is otherwise an exemplary system, and the best I can recall in JGH's basement. Incidentally, all of the sonic impressions related here were obtained with the non-HF-filtered outputs, the Cochrans never going unstable with either the Quads or the Sound Labs.

The Threshold SA-1s did not fare well in the comparison. They were much more impressive in terms of bottom-end punch and impact, but fell short in other areas. Harmonic textures through the Thresholds were consistently drier and grainier. Hall reverb was not as easily resolvable, as, for example, on Feste Romane (Mobile Fidelity MFQR 1-507). The midbass was too lean and the depth perspective was also reduced. Transparency and instrumental focus also suffered by comparison—as evidenced, for example, by David Abel's Guarnerius. I found the Thresholds much less involving, and actually more typical of Class B than A in performance level.

The Krell KSA-100 fared much better, coming very close to the Cochrans in transparency and resolution of low-level detail. Again, the Cochrans were bested in terms of deep-bass punch and control. However, the Krell's solid-state character was very evident: it was not as liquid or focused in the mids. Instrumental outlines, by comparison, were slightly smeared, and lacked the almost palpable spatial extension of the Cochrans. The Delta Mode amp appeared to me to be the most musical of the three, and certainly the most enjoyable. I'm not sure JGH is convinced of this as yet, but then, he has not spent as much time comparing these amps.

The Delta Mode amps strike me as an almost perfect amalgam of vacuum-tube and solid-state technology: a very successful hybrid indeed. With the right tube complement, classic tube magic manifests itself in spades, including spatial resolution, dynamic bloom, and liquid harmonic textures. Yet the Cochran amps are capable of performance in the lower octaves rivaling that of the best solid-state designs. They can deliver lots of watts into the right loads, but please note that they are current-drive limited. With only 8 amps peak-to-peak current capability, there's no way they can compete with the real muscle amps with 40 or more amps of juice, and consequently they do give up something in deep-bass impact. Neither are they the ideal amps for low-impedance loads like the Apogee Scintillas, but they did manage quite well with the Calipers.

The Delta Modes possess the personality of a small amp; they're that clean and refined. Yet they have big-amp muscle, and with the right speaker can really put out. They cannot be used for common-ground bi-wire applications or for summed-bass speaker configurations, and therefore fall short of that mythical universal amp. There is no such beast! I can think of a best amp for a particular speaker, but not the best amp for all speakers. In the context of a state-of-the-art installation, the Cochran amps deserve clear consideration; they're that good, and some aspects of their performance impress me as nothing short of that coveted pinnacle.

Up until recently, the amps were marketed directly to the consumer—you and I—primarily to keep the retail price as reasonable as possible. Actually, it occurs to me that anyone who could afford the original price of $6800 should be able to stretch to the current retail price of 10 kilobucks. Anyhow, the amps are presently available through a few select dealers. If you find them near you, be sure to give them a listen; they're likely to redefine your perception of a power amplifier's sonic potential.

Postscript

The day after sending JA my copy on the Delta Mode amplifiers, one of the channels went unstable, highlighting the possibility that reliability may be an issue with this amplifier. I intend to resolve the problem with the manufacturer.

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Stereophile, November 1987
TWO MUSICAL PRODUCTS FROM ROWLAND RESEARCH

Lewis Lipnick

Coherence One: Dual-chassis stereo preamplifier with outboard power supply. THD and noise: less than 0.04% at 1kHz (phono stage), less than 0.015% at 1kHz (line stage), both 0.5V RMS output. Input impedance: 0-200 ohms, adjustable, 47k ohms, fixed, or any value, user selectable (phono stage), 10k ohms (line stage). Phono stage gain: 40, 50, 60dB, user selectable. RIAA accuracy: 20Hz-20kHz, ±0.15dB. Line stage gain: 20dB. Line stage frequency response: 0.2Hz-500kHz, -3dB. Output impedance: 150 ohms. Maximum output level: 15V RMS. Power requirements: 50W idle. Dimensions: 19” W by 13” H by 13” D. Weight: 37 lbs. Price: $3950. Approximate number of dealers: 24. Manufacturer: Rowland Research, 20-C Mountview Lane, Colorado Springs, CO 80907. Tel: (303) 528-8388.

Model 5: stereo power amplifier. Output power: 150W RMS continuous into 8 ohms, 300W RMS continuous into 4 ohms, 475W RMS continuous into 2 ohms. Power bandwidth: 0.16Hz-350kHz, -3dB. Output current: 30 amps peak, continuous; 75 amps peak, 0.1 ohm, 20ms. Slew rate: 75V/µs, 100V p-p, 8 ohms. THD and noise: less than 0.03%, 1kHz, 8 ohms, 20W; less than 0.08%, 1kHz, 100W; less than 0.012%, 1kHz, 8 ohms, 150W. Damping factor: greater than 175, 20Hz-20kHz, 8 ohms; greater than 60, 100kHz, 8 ohms. Overall gain: 20dB. Sensitivity: 115mV, 1W, 8 ohms. Input impedance: 100k, 20k, 3k ohms, user selectable. Dimensions: 19” W by 8¾” H by 24” D. Weight: 103 lbs. Finishes available: gold, grey, black. Price: $4600. Approximate number of dealers: 24. Manufacturer: Rowland Research, 20-C Mountview Lane, Colorado Springs, CO 80907. Tel: (303) 528-8388.

Founded in 1980 by Jeff Rowland, Rowland Research has grown from a relatively obscure manufacturer of power amplifiers to a highly respected member of the audio manufacturing community. Most readers will probably associate the name with the Model 7 amplifier, one of the heavyweight contenders in the high-roller, high-power amplifier league. The two products reviewed below are not only recent additions to the Rowland line, but also represent two firsts for this manufacturer: their first preamplifier and first stereo power amplifier. Both the Coherence One and Model 5 were first offered in January 1986, and except for a few refinements in design, have remained unchanged since then.

I am not going to bore the reader with unnecessary details concerning circuit topology and other technical matters. As a musician first, and audiophile second, I firmly believe that any good piece of audio gear should be able to speak for itself. The degree to which it succeeds or fails to reproduce music should say it all, without the reviewer having to produce technical reasons for the sonic results. There are, however, some important design philosophies and strategies employed by Rowland that I believe are necessary to discuss.

Every manufacturer of high-end audio would probably tell you that their ultimate goal is to reproduce music as faithfully and accurately as their knowledge permits. While this may be the case, too many manufacturers get caught in the “sonic trademark” trap: concentrating on one or another parameter of musical reproduction that will give their products a sound unique to their design. If the potential buyer is satisfied with, or actually looking for, the particular manufacturer’s musical viewpoint, all well and good. But if he, like myself, is searching for accurate musical reproduction without sonic editorializing, the list of available product has been short indeed. Enter Rowland Research. Jeff Rowland’s philosophy of musical reproduction differs from the accepted norms, as it deals with emotional and subjective aspects of musical performance often ignored or unrecognized by many members of the audio industry. While this unconventional philosophy of audio design is probably at odds with those hi-fi fanatics looking for new and
better ways to blow out their windows, it is a breath of fresh air for this musician.

**Rowland Research Coherence One preamplifier**

The straightforward physical layout of the Coherence One preamplifier suggests that a great deal of thought went into the ergonomics and visual aesthetics, as well as the sonics. The two-piece design allows the control unit to be placed directly on top of the outboard power supply, which makes for a very attractive stack approximately four inches high. The particular unit that I listened to is finished in a very dark slate gray, and is one of the most attractive-looking pieces of audio equipment that I have had in the house. (My wife, Lynn-Jane, actually likes the looks of the Rowland pieces—a first. More on this later).

The circuitry is class-A, and the preamp runs quite warm (almost hot) to the touch. And, like many of the better preamps nowadays, there is no power switch: once the unit is plugged into the wall, it should be left alone.

There is no feedback utilized in the Coherence One (nor in any other Rowland products, something Rowland emphasizes), which, according to the manufacturer, greatly decreases or eliminates "time-related" distortions. The static distortion often found in totally feedback-free designs is insignificant, according to Rowland, through use of a high-quality power supply "equalling or exceeding the performance of the audio circuitry." The Coherence One utilizes all discrete circuitry, with FETs used rather than bipolar transistors. This unit, like all Rowland equipment, is direct-coupled, thereby eliminating capacitors anywhere in the signal path.

The control layout is simple yet effective. The master volume control, located in the physical center of the front panel, is flanked by two level-trim controls for left and right channels (they affect each channel up to a maximum of 6dB). The four input/source switches—phono, tuner, tape, and CD—are located on the left side along with an absolute-phase reversal switch (something very useful with CD players). A selectable tape output section allowing the simultaneous recording from one source while listening to another, and an output muting switch, are located on the right. All switches are the "lighted feather touch" variety, and operating relays are at the rear of the unit, in order to avoid long wiring runs inside the chassis. There are two sets of outputs, but, as with the Klyne Sk-5A, British Fidelity MVT, and Audio Research SP11, the second set is in inverse polarity to the first. This configuration allows the output of the preamp to be wired in a balanced configuration, since the designer feels that fully balanced inputs and outputs will become commonplace, and offer improved signal/noise ratios and sonics. (I agree.) And, unlike most equipment that has absolute phase reversal capability, this unit utilizes two separate parallel amplifier sections, in order to avoid sonic degradation from the usual additional circuitry required.

The phono section is about as flexible as anyone could sanely desire. There are variable adjustments on the rear of the unit to dial-in the correct loading for moving-coil cartridges (0-200 ohms), as well as jumpers located inside the chassis for the variable gain (40, 50, or 60dB). Rowland also supplies a variety of resistors that can be soldered into place once the correct phono-cartridge loading is deter-
mined. Unless the buyer is acquainted with proper soldering techniques and cartridge loading, it would probably be best to leave this part of the preamp setup to the dealer.

The Coherence One is built like a tank, and "feels" just great. The quality of construction, both inside and out, is superb, indicating Rowland's dedication to simplicity and quality control.

Musical and sonic qualities: The Coherence One is one of the most musically believable preamplifiers I've heard to date. While it does not seem to have quite the overall focus of my current reference preamplifier (a Motif MC-7), it does an excellent job of reproducing the complex harmonic structures of voices and instruments, particularly within large orchestral, choral, and organ works. It also does the best job of any preamp I've heard in determining the exact size and placement of the soloist, ensemble, or organ, and the space in which the particular performance is taking place. While some preamps more clearly define the leading attack of each musical transient, they often don't carry through with the necessary musical information after the fact. The lack of this musical "meat" deprives the listener of each performer's individual characteristics (something tubes can do very well, though often at the expense of significant colorations), imparting a somewhat hollow quality to the sound. While many audiophiles may not be bothered by this, musicians would rather leave the room.

The Coherence One doesn't just get the harmonic flavor of the music correct; it gives the listener some real information about the amount of energy the musicians, collectively and individually, are expending. Everyone knows that the brass section of the Chicago Symphony plays with more balls than anyone else, but with the C-1, I can feel that they move a huge amount of air through their instruments. Likewise, I can sense that the brass section in the London Philharmonic Orchestra plays with a more up-front, lighter, bright sound, with less air support behind the initial attack. Yo-Yo Ma's already superb performances of the Elgar and Walton Cello concertos become even more involving and viscerally gripping through this preamplifier, since the weight and intensity of his remarkably well-controlled bow technique becomes more obvious. The Coherence One does all this without calling attention to itself. In fact, when I began to seriously listen to it after the initial break-in period (it took two weeks to settle in), I was immediately struck by the total lack of any electronic grain or edge, euphonic colorations, added warmth, or other sonic aberrations.

These observations remained consistent with both the phono section and line stage. While I have not yet had the opportunity to audition the C-1 with any of the lower-output moving-coils (having used primarily high-output moving-coils and moving-magnets), the lack of coloration within the preamp allowed me to hear all of the problems associated with incorrect VTA, poor vinyl pressings, cartridge colorations, incompetent recording techniques and performance, unlistenable CDs, and every other nightmare that plagues audiophiles. I should mention that, while the C-1 is a very musical-sounding piece of equipment, it does not cover up the aforementioned horrors in any way. While it might not make your ears bleed like some preamps, it will certainly let you know when something isn't quite right.

Soundstage: I normally wouldn't dedicate a subheading to this generally overstressed and misunderstood parameter of musical reproduction, but the way in which the Coherence One gets this right deserves special mention. Too much audio equipment that supposedly reproduces dimensional soundstage does so in some frequency-dependent manner. The Coherence One does not. While the C-1's soundstage might not be as spectacular as some, it is much more natural, being completely dependent on the program source rather than frequency. Stage depth, height, and distance to listener is better defined than with any other preamplifier that I have heard, and remains consistent at all volume levels (it's so nice to be able to listen at low levels without the music sounding like a pancake). And since this imaging is not frequency related, instrumental voices don't wander as they do with too many highly regarded electronics.

Spectral Balance: This is another misunderstood and overused term in audio, but significant to this review: the C-1 doesn't have any spectral balance—it's absolutely neutral from top to bottom. Just as in live music, there is no sectioning of frequencies into highs, upper mids, mids, lower mids, upper mid-bass, mid-bass, bass, and deep bass. Spectral balance
Rowland Research Model 5 power amp

nomenclature has really nothing to do with music, only hi-fi, and the C-1 is not hi-fi.

While some listeners might find the deep bass to be a bit light, they probably haven't heard enough live music. What they probably don't realize is that bass (in natural form) is not bloated, heavy, and detached from the rest of the frequency spectrum, only lower in pitch. The same applies to the high frequencies. While the air and space present in live music is faithfully reproduced through this preamplifier, some listeners used to the overly bright high frequencies purported to be accurate by some members of the high-end audio community will probably find the lack of upper-midrange glare and overly etched forward highs to be boring. If this is boring, I'll take it.

**Colorations:** The Coherence One is the least sonically colored preamp that I have heard. While this should be a positive attribute, many potential buyers would probably prefer a piece of equipment that grabs them by the throat (or somewhere else, for that matter), since the thought of actually listening to music for music's sake is unconscionable. The Coherence One does not have a warm or cold sound. It is not bright or dull. It is a true sonic chameleon, taking on the characteristics of the program material.

**Shortcomings:** Although the Coherence One presents musical information in just about as uneditorial a manner as I have heard, it does not provide the music with all of the "breathing space" present in live performance. This subtle lack of air and space prevents the complete presentation of the resonant envelopes surrounding instruments and voices. This results in the slight lack of focus and "instrumental attack acuity" that one experiences when placed at a distance from the performers. While the Motif MC-7 does not supply me with as much information concerning instrumental colorations and exact stage placement as the Coherence One, it does a significantly better job of creating a believable "musical overview" and "resonance recapture" of both individual musicians and collective ensemble.

**Conclusion:** The Coherence One is, overall, one of the most musically involving preamplifiers I have had the pleasure to audition. While it may not have the absolute degree of focus and instrumental resonance retrieval currently available, its musical merits far outweigh its less significant shortcomings. It is not a product for the hi-fi obsessive (giving up some drama for introspection), but a reference-quality component that reproduces the fine detail, nuance, power, and energy found in live music.

**Rowland Research Model 5 power amplifier**
The Rowland Model 5 Stereo Power Amplifier is an outgrowth of the same manufacturer's
well-respected Model 7 Mono Power Amp. The design of the 5 is similar to the 7; only the output-stage capabilities and power-supply potentials have been reduced. The Model 7 is rated at 350Wpc; the Model 5 at 150Wpc. There are 18 bipolar output transistors utilized in each channel of the Model 5, along with 82,000uF of capacitance per channel. The front-end power supplies are fully regulated, the output section is not.

The Model 5 incorporates some unique features which merit mention. The front-end power supplies remain powered at all times, thereby shortening the warmup time required (about 30min according to the manufacturer; I have found it to be more like 10min). The power switch consequently controls only the output stage. The second useful feature involves the thoughtful prevention of possible transient spikes after a power interruption. If the unit is shut down by an AC interruption, it will not automatically turn back on once power is restored, but will remain shut down until the user depresses the power switch.

The third feature is a seemingly insignificant, but very useful, addition. Two sets of output connections are available at the rear of the unit; large screw terminals as well as the standard five-way binding posts. This conveniently allows the audiophile who has one or the other type of speaker cable termination to connect the amplifier to the system without having to deal with time-consuming and frustrating connector incompatibilities.

The last, but possibly most significant, feature of the Model 5 is the user adjustable input impedance. According to Rowland, the lower the interconnect-cable termination resistance the better (this actually helps to reduce the negative aspects of cable interaction). But since the characteristics of cables differ, along with the fact that some preamps can drive a lower termination impedance with more success than others (in general, direct-coupled preamps will do better than those with output-coupling capacitors), they have decided to give listeners the option of picking the input impedance best suited to their particular preamplifiers and interconnect cables. This adjustment is made by setting a four-position DIP switch on the main circuit board. This does require the owner to remove the cover (which can be awkward, especially if the unit is hot), but the sonic advantages that can be attained through experimentation with these settings make it ultimately worth the investment in time and burned fingers.

The Model 5 is large, and extremely heavy—do not attempt to carry this amplifier by yourself, as I unwisely did. Cooling is accomplished by natural convection (the cooling fins run along the two sides), thereby precluding the need for whisper fans. Since the unit does run quite hot, it should be given adequate space, and kept away from small critters such as our pet rabbit, Bonkers, who burned his nose on it. My sample was finished in the same beautiful dark-gray slate as the Coherence One, and is a pleasing match to the C-1.

**Musical and sonic qualities:** The Model 5 shares all of the extraordinary musical qualities of the Coherence One preamplifier, but does even better. While the C-1 gives up some ultimate musical focus, the 5 does not. The Model 5 is capable of credibly recreating the power and weight of a full symphony orchestra, chorus, and organ to my satisfaction in my listening room (and that's saying something), while still providing me with the subtle nuance and colorations that I hear in live performance. It isn't adequate, or even acceptable, for an amplifier to simply reproduce believable dynamic levels; dozens of products can do this. It must be able to coherently recreate the complex harmonic and textural musical information present in recordings, without any frequency-related imaging or spectral sectioning. As I mentioned earlier, many amplifier manufacturers appear to concentrate on one or two parameters of sonic reproduction, to the detriment of the overall musical perspective. This fact alone doesn't necessarily mean that such a product will sound unmusical; more often than not, those sonic trademarks targeted by the designer call attention to themselves, thereby giving the listener two parts of a picture: the designer's sonic trademark, and everything else.

Jeff Rowland's holistic approach to musical reproduction is exactly antithetical to the sonic trademark methodology, and the Model 5 is living proof. Although I've been trying to attach adjectives to the 5's sonic palette, I cannot. In fact, it is so neutral that the only adjective I could possibly come up with is "sonically invisible." Soundstaging is completely dependent on the source material, and is not frequency-related. And, like the Coherence
One, the spectral balance is so natural and even that this overused term is not applicable.

While the Model 5 may not have the extremely tight, visceral bass characteristics touted by some competing products, it does have more natural low-frequency reproduction than most, allowing the listener to discern the harmonic detail and speed of attack in the lowest octave of music (there actually is texture and nuance in the nether regions). The differences in initial transient attack between electric and acoustic bass are clearly evident, as well as the volumetric air-pressure differences between single-head vs double-head bass drum, and large-bore vs small-bore bass tuba. Low bass, particularly when produced by orchestral instruments, does not have the immediacy of attack so often suggested by the majority of solid-state amplifiers. Instruments such as double bass, bass drum, bass tuba, organ pedal, and contrabassoon require more time to speak than the higher-pitched instruments (they need to move more air), and therefore have heavier, rounder, more indistinct attacks. The Model 5 is the first solid-state amplifier I have heard that reproduces this characteristic accurately. Additionally, the 5 does not have the euphonically forward and present midrange common to many tubed amplifiers, nor the recessed midrange often encountered in solid-state designs. There is no sensation of any electronic grain or hash, and the common, dry high-frequency colorations found in most solid-state amplifiers are totally absent.

The variable input impedance capability of the Model 5 has a far greater effect on the overall musical and sonic perspective than I would have expected. With the 100k ohm setting, the extreme high and low frequencies appear to be somewhat detached from the rest of the sonic palette. The soundstage is slightly compressed, and instrumental sounds propagate within an artificially dry acoustic. The 20k setting fares much better, allowing the sound-stage to open up, the contra octave of bass to bloom, and the highs to become more neutral. The real revelation came when I switched to the 3k setting. I immediately became aware of more ambient information, along with much more dimensionality. Orchestral instruments became more clearly focused, and appeared to be more realistic in physical placement. Timbre and pitch centers of all instruments became more easily discernible, allowing more of the particular characteristics of the performers to come through. Although I would have expected the low frequencies to suffer at this setting, they actually became more clearly defined and less bloated. The lower input impedance also reduced many of the colorations present in different interconnects, thereby effecting a more direct coupling between the C-1 and Model 5. All of my subsequent musical and sonic judgments of the amplifier were made with the input set at 3k.

Conclusion: There really isn't much to conclude about the Model 5, except that it sounds less like a piece of electronic equipment than any amplifier I've previously heard. It seems to have more than enough dynamic capabilities, driving my Martin-Logan Monoliths to full fortissimo orchestral levels with ease, and sounds consistent from top to bottom of the sound spectrum at all volume levels. The only caveat might be that, since it sounds its best at the 4k ohm input setting, the driving preamplifier must have the capability to successfully load into this somewhat unusually low impedance.

The Coherence One and Model 5: Summing Up

One would expect that two products from the same manufacturer would interface positively (they usually do), but with the C-1 and Model 5, this relationship results in performance significantly exceeding the individual units' capabilities. This almost magical synergy cannot be adequately explained, since it involves the subjective emotional energy created at live performances. While the C-1 and Model 5 work perfectly well with products from other manufacturers, the combination of the two places the listener in, rather than at, the performance. The other night, while listening to the Bruckner Motets (some of the most beautiful choral music ever composed), I became so involved that I found myself breathing with the performers, as if I were on the stage with them. This has never happened to me before, except when actively involved in playing a concert. The same also occurred while listening to Bernard Haitink's recording of Shostakovich's Symphony 8. This is a piece that we in the National Symphony often play, and it has one of the most difficult and drawn-out
English horn solos in the orchestral literature. Since I sit directly behind our English hornist (Richard White, the best in the business), I am aware of, and can feel the emotional energy that he expends during this solo. I experienced the same gut feeling the other day while listening to the English horn player in the recording, as if I were on stage with him.

To be more objective, I would venture to guess that this uncanny ability to transport listeners into the performance is due primarily to the fact that the Rowland equipment simply doesn’t get in the way of the music. Although the ear cannot always consciously detect the sonic roadblocks set up by electronics, the brain spends most of its time attempting to see through the obstacles, rather than concentrating on the program material. My wife, Lynn-Jane, who usually doesn’t comment on the sound of my reference system (other than to say “it sounds all right”), unsolicitedly spoke in glowing terms of the Rowland equipment. Her description of “it sounds warm, full, and rich” is not the same terminology that I would use, but is valid nevertheless. She went on to point out that although this equipment is very easy to listen to, it doesn’t leave anything out. I should also note that the C-1 and Model 5 are very low in MIF (Marriage Interference Factor—her terminology for degree of sonic and visual equipment intolerability; the lower the MIF, the better), and very high in WAF (Wife Acceptance Factor). While this might not have any direct effect on the performance of equipment, it can certainly have positive effects on an audiophile’s lifestyle.

**Overall Conclusions**

As the reader has probably guessed by now, I like the Coherence One and Model 5—a lot. They are excellent pieces when scrutinized separately, but create an almost magical atmosphere when used together. The only shortcoming, that of the Coherence One’s inability to recapture in full the hard kernel of resonance surrounding instrumental and vocal sound propagation (resulting in slight lack of focus), prevents totally uncompromised musical accuracy. This is not equipment for those looking for spectacular sonics, so members of the “boom and sizzle” crowd need not apply. But if you enjoy listening to live music, and have the ability to emotionally involve yourself with the performance, I would suggest that you give the Coherence One and Model 5 a serious audition.

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**SANSUI CD-X901 CD PLAYER**

Dick Olsher

![Sansui CD-X901 CD Player](image)

**Sansui "Vintage" CD player**

Type: 16-bit CD player with three-beam tracking. Frequency response: 4Hz-20kHz ±0.3dB. Output voltage/load impedance: 2V/5k ohms (unbalanced or normal output); 2V/600 ohms (balanced output); 0.5V peak-to-peak/75 ohms (digital output). Price: $1400 w/remote. Approximate number of dealers: 40-50. Manufacturer: Sansui Electronics Corporation, 1250 Valley Brook Avenue, Lyndhurst, NJ 07071. Tel: (201) 460-9710.
Sansui has not, at least in recent memory, been an audiophile buzzword. After all, how many audiophile friends of yours own a Sansui anything? In my mind, Sansui is synonymous with mass-market merchandising and its inevitable sonic compromises. Mass marketing is based on three proven principles: First, the law of supply and demand. Paraphrased from the manufacturer's point of view, this means don't argue with demand—if a lot of folks want a $199.95 music center, so be it! Second, although money isn't everything (for example, it is not plentiful), it is still worth making. Former Secretary of the Treasury W. Michael Blumenthal once commented that the difference between business and government is that government has no bottom line. And unlike government, business has to earn money to stay alive. The easiest way to make big bucks is to sell a lot of something. A $20 profit per item for a high-end dealer would be economic suicide. But a million times 20 bucks is a nice bottom line indeed. The third principle has to do with features: load it up with more features than they know what to do with, because more is less, even if it looks like more. This practice also applies to the up-market models in a given line. For example, the only differences between $200 and $400 receivers may be empty features that do not improve the sound quality, the same integrated chip being used for signal amplification. Oscar Wilde said it best: "Nothing succeeds like excess."

To the audiophile interested in reproducing a convincing illusion of live music in the home, mass-market equipment has generally proved disappointing. But there are indications that Sansui is now making an effort to offer products of interest to the audiophile; the model CD-X901 is a case in point.

I hope that the notion that all CD players sound alike has been universally dispelled. However, the myth that differences between players are due solely to differences on the analog side of the deck unfortunately persists. In truth, significant sonic differences are possible in the digital electronics. The type of digital filtration used, the efficacy of the error correction code, the linearity and drift of the DAC used, and corruption of the digital binary data flow, all impact on the quality of the decoded analog signal. The latter factor is only now being addressed by the industry (see my review of the California Audio Labs Aria CD player in Vol.10 No.7). The clocked binary data stream originating from the laser pickup consists of ones and zeros. The 1 is represented by the rising edge of a squarewave pulse, the 0 by the falling edge. In the real world, these squarewaves are not perfect in shape because of finite rise and settling times. It is possible for the tails of these square pulses to overlap and obscure a space. This can lead to timing errors and the generation of corrupt data. In theory, even a cable could affect digital data transmission if the squarewave pulses are sufficiently dispersed or time-smeread in transit. Of course, the worse the incoming pulse shape, the more critical the subsequent signal degradation.

The 901 is a smart-looking player with a streamlined profile and a substantial chassis. The quick, robust drawer mechanism inspires confidence, and access time is on the order of one second. I don't have any technical details on this player, but I can tell you that its error correction works very well indeed. The 901 had no problems at all with the surface defects on the Philips Test CD (814 126-2), sailing through the 0.4 to 0.6mm loss-of-information wedge, the 0.3 to 0.8mm black dots, and the simulated fingerprint without any audible glitches. Just as a child never throws up in the bathroom, a dropped CD never lands cleanly. So take note if you're too lazy to clean your CDs or just plain sloppy: this player will probably handle CDs contaminated with everything from ear wax to pizza stains.

Prior to any serious listening, the 901 was allowed to stabilize for 72 hours. Solid-state devices usually don't like thermal shocks, preferring a constant thermal environment. It is, in fact, good practice to leave a CD player on all of the time. It will not only like you for it, but will also sound better. The Threshold FET-10 preamp and the Krell KSA-100 power amp were used throughout the listening sessions, driving both the Quad ESLs (with the Koval mod) and the Dahlia-Debra speakers (with the TSN or large-magnet version of the Audax 8" TPX cone, which not only improves the bass but also speeds up transient attack). My first listening impressions, however, were with a pair of Beyerdynamic headphones. There was a hint of brightness via headphones, which could only portend a bigger problem via speakers. And sure enough, the 901 turned
out to be quite bright-sounding. To quantify this coloration, I should point out that on good CDs the brightness is noticeable but not really obnoxious. That is to say, it’s tolerable. On bad CDs, where either heavy treble equalization is used or where the upper-mid to lower-treble region is hard to begin with, the 901 exacerbates the reproduction to the point of active irritation.

Let me give you several examples. Emma Kirkby and company (Gothic Voices, Hyperion 66039) sounded slightly bright, which lent a somewhat piercing quality to the upper registers. The sound quality was reasonably listenable nevertheless. Kiri Te Kanawa’s voice, on the other hand, both on Blue Skies (London 414 666-2) and Chants d’Auvergne Vol.1 (London 410 004-2) was uncomfortably bright. Impact CD-2—a demo disc produced by the Japan Audio Society—is quite interesting. Although there isn’t that much music, some of the selections are high-powered. (Would you believe a Boeing 747 takeoff and landing?) There’s a lovely soprano voice on band 11 that the Sansui portrayed in a bright, forward manner that I found unlistenable. Throughout my listening sessions, I frequently compared the sound of the 901 with that of the Sony 705ESD player recently reviewed by JGH (Vol.10 No.7). This is a fair comparison because the retail prices of the two players are comparable within a hundred bucks; they would be competing head to head in the marketplace. The Sony is just on the edge of being bright, and the extreme treble is a little grainy, so a perfect player it is not. But it was consistently better behaved through the brightness region.

String overtones did not fare much better on the Sansui, being dry in character at low volume levels and objectionably bright at moderate to loud volume levels. The Sibelius Second (BIS CD-252) lacked bloom and life through the upper octaves, while the string overtones were generally too piercing. The Sony sounded better balanced through the upper octaves, with less upper-mid emphasis. Better string sound was achieved on Ashkenazy’s Sibelius First (Decca 414 534-2). Here string tone was not so bright, but merely overly dry.

Harmonic textures were persistently on the dry side, as though the player had built-in wash, bleach, and dry cycles. Proper reproduction of tonal colors demands that harmonic textures be reproduced naturally. As this is an important priority of mine, I will show no mercy in this area and pull no punches: the 901 fails in this respect.

The bright character alluded to above also lends the 901 a forward, in-your-lap type of presentation. On Gothic Voices it was very difficult to tell that the singers were a long way from the mic. JA, who published an article in HFN/RR about the recording session in London, mentioned about 30 feet from mic to stage. Through the 901, the singers appeared to be more like 10 feet away. The soundstage center of mass was consistently moved forward, or, invoking the principle of relativity, I was transported closer to the soundstage. Too much intimacy, I’m afraid, for my taste.

Another unsatisfying aspect of the 901’s performance lies in the area of spatial resolution. It is firmly rooted in the Flatland school of spatial impressions subscribed to by so many CD players. To begin with, the depth perspective is diminished, and it is difficult to get a sense of hall size. The Sony, incidentally, is not much better in these respects, in my opinion. There were losses in instrumental focus, and the spaces occupied by the instruments within the soundstage appeared flat, without the palpable spatial extension good analog program material is capable of. Spatial smearing, for example, was noticeable throughout the Opus 3 Test Record 1. Massed voices blended together so that it was impossible for me to pinpoint the exact location of any individual singer. The Sony appeared to me to be a little better focused, but both players were dwarfed in terms of spatial resolution by the much more expensive CAL “Tempest.”

I’ve left the good news for last. The 901 impressed me with its resolution of low-level detail. The sound was always squeaky-clean, and, together with its bright, forward characteristics, combined to give the 901 a sense of heightened transparency. The Sansui clearly edged the Sony in the area of see-through lucidity in the midrange, and its extreme high frequencies were smoother than those of the Sony, though without the latter’s treble spaciousness.

Flat, bright, and dry are not the sort of adjectives to describe an audiophile machine. The sonic flavor of the 901 is decidedly canned as opposed to natural. Yet, I think Sansui is on the right track with this player. After all, it bet-
ters the slightly more expensive Sony in a couple of respects. It also better a lot of under-$1000 mass-market players I've heard. As a first audiophile endeavor, the 901 is commendable; I encourage Sansui to continue development efforts. If I had to choose between the Sony and the Sansui machines, I'd certainly opt for the Sony—shotgun wedding though it might be—because it is much more listenable.

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**FLOORED!**

John Atkinson reviews two floor-standing (and one stand-mounted) loudspeakers


So far, as part of my quest to find a box loudspeaker costing under $1000 per pair that sounds much better than it has any right to, I have reviewed 13 models, in the August and October issues of Stereophile (Vol.10 Nos.5 & 7). For this third group of loudspeakers, I have expanded the price range upward a little to include an interesting omnidirectional design from California, the DX Labs DX17S.

The test procedure followed that established for my previous loudspeaker reviews: each pair was used with Audio Research SP-10 II/Krell KSA-50 amplification, Mission PCM 7000 CD player, and a 1987 Linn Sondek/Ittok/Troika combination sitting on a Sound Organization table. A Mission Cyrus 2 integrated amplifier was also used, being more representative of the kind of hardware to be found driving speakers at this price level. Interconnect was Monster Interlink Reference A; speaker cable was Monster M1. The loudspeakers were carefully positioned for optimum performance, and coupled to the tile-on-concrete floor beneath the rug with screw-in spikes, in the case of the Synthesis, or with TipToes. In addition to a rigorous listening test, with no other speakers in the room, each pair of speakers was used for an extended period.

The frequency response of each speaker was measured in the listening window—spatially averaged to minimize room standing-wave problems—using ½-octave pink noise; also, the nearfield low-frequency response was measured with a sinewave sweep to find the true bass extension relative to the level at 100Hz. Changes of impedance with frequency and sensitivity (using ½-octave pink noise centered on 1kHz) were also measured.

Stereophile, November 1987
DX Labs 17S: $1200

Although omni or quasi-omnidirectional loudspeakers have had a consistent following in the USA, this has not been the case in the UK. When John Dexter of DX Labs offered to send a pair of his 17S loudspeakers for review, therefore, I jumped at the opportunity to hear a design departing radically from the box speakers I am used to, where the forward response approximates a cardioid pattern in the midrange and above. (Diffractive effects mean that all box speakers are omnidirectional in the bass, due to their small size compared with the wavelength of the sounds they produce at these frequencies.)

A handsome tower of a speaker, the 17S is completely covered in brown or black grille cloth, apart from a 1" real-wood pedestal. Underneath the skin, a 26" by 10"-square MDF box is lined with fiberglass wadding and is supported above the pedestal by four integral feet, a vent in its base firing downward into the resultant air space. What appears to be a doped-paper cone woofer is mounted at the top front of this box, while a short vertical stalk rising from the top center supports a printed circuit board upon which are mounted no less than four small tweeters, facing forward, backward, and to the sides. An integral 6.5"-high wooden framework around this tweeter array continues the rectangular profile of the speaker upward, so that the speaker's exterior doesn't appear out of the ordinary. The tweeters themselves appear to be ¾" plastic-dome units, with plastic phase plates in front of the domes, and quite small magnets.

The reason behind the use of this (patented) array is twofold. First, whereas omnidirectional speakers can have problems due to reflections and diffractions from the rearward-traveling soundwaves, the array in the 17S eliminates this "multipath" distortion by having the tweeters mutually cross-polarized, i.e., the front- and back-facing tweeters are wired in phase while the two at the sides are wired out of phase. Second, by arranging the phasing...
of the four tweeters thus, the array is said to eliminate what John Dexter refers to as "Thermodynamic Distortion," which he feels lies behind the "gritiness in voice reproduction in all speaker sound as we know it today." In a paper supplied with the speakers, he explains that as the pressure/volume relationship for air is non-linear, at high frequencies, equal compression and expansion strokes of the diaphragm result in different changes in pressure; *ie*, the resultant acoustic soundwave will be distorted. The array of the 17S, however, "simultaneously transduces both the input signal and its inverse, producing the acoustical effect of full-wave compression along with full-wave rarefaction." Hmm.

Electrical connection is via 4mm sockets on the speaker's rear, while the crossover consists of a large horizontal pcb mounted underneath the reflex vent. Absolutely conventional, the seven-element crossover uses second-order, 12 dB/octave slopes, with resistive padding to adjust the sensitivity of the tweeters to both that of the woofer. Component quality appears to be good, but although air-cored coils are used, they are positioned in parallel rather than mutually perpendicular, as is usual; some cross-coupling could well result.

**The sound:** As often happens with high-end products, there were two significant revisions to the 17S during the review process: the samples finally auditioned were the third pair to be received, and the crossover boards showed much sign of having been modified. DX Labs recommends that the 17S be placed quite near the rear wall for the best spatial effect; accordingly, I positioned them around 9° from the rear wall, firing straight ahead and spaced about six feet apart. My sitting position was around seven feet back, my ears level with the tweeter array.

Pink noise revealed the 17S as having a basic "three-peak" response, with the upper bass, upper midrange, and mid-treble standing isolated. The tweeter array didn't seem to be that well integrated with the bass/midrange unit, there being a lack of energy at the bottom of its range, and there was quite severe "vertical-venetian blinding;" *ie*, small, lateral head movements produced disproportionately large changes in tonal balance.

On music, although central imaging was a little unstable—this might have something to do with the heavy wooden framework at the corners of the tweeter enclosure—the reproduced sound was very spacious, with an excellent sense of depth. Coupled with what appeared to be good treble detail, this spacey sound initially made quite a good impression on me. This wasn't for long, however, as tonally, there was a lack of body to instrumental tone and voice, coupled with a hardness to string tone in the upper presence region. Extreme high frequencies were slightly dull. Bass instruments had plenty of weight, though low-frequency instrumental differentiation was a little unclear. Though the cabinet seemed reasonably nonresonant, there was quite a severe "cupped-hands" coloration audible, particularly noticeable on piano and voice.

All in all, the sound produced by the DX Labs 17S was well below what I would expect at its price level.

**Measurement:** My measured sensitivity was a little higher than that specified, at 91dB/W/m, but this measurement was undoubtedly confused by the very non-flat spatially averaged response measured in-room. Taking the 1kHz level as a datum, the upper bass peaked by about 3dB, above which there was a depression approximately 6dB deep in the lower midrange, covering almost the entire two octaves from 125Hz to 630Hz. A narrow, deep suckout above 1kHz—accompanied by considerable distortion (see later)—was followed by a peaky mid-treble region (particularly pronounced on the speaker's forward axis, though alleviated somewhat in my listening position), with the top octave rolling off prematurely. (The exact degree of roll-off seemed to vary, dependent on speaker position.) As would be expected from the fact that the forward-facing tweeter has an out-of-phase tweeter on either side, the high-frequency response fell off rapidly more than about 30° off-axis horizontally, returning by the full 90° position.

For reasons connected with the elimination of the distortion mechanisms mentioned above, DX Labs chose a lowish crossover frequency, ca 1200Hz. I feel this to be misjudged, however; considerable distortion could be heard in the 1250-2000Hz region, even at a mild 84dB spl, suggesting that the tweeters cannot handle much power in this region. This was confirmed when playing the drum track on the *HFN*/RR Test CD at a not-extreme 96dB level: one of the tweeters on the left-hand speaker developed a bad rattle.

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On a more promising note, the box seemed well-damped, and while the nearfield bass response appeared to extend only to a rather high 53Hz, considering the box size, this did not take into account the output from the downward-facing port. In-room, the bass response was clean-sounding, and extended to 40Hz, though it fell off very rapidly below that frequency, something to be expected from a reflex design. While it rarely dropped below 8 ohms in the midrange or bass, the impedance fell to an almost uniform 4 ohms above 4kHz.

**Conclusion:** The 17S is undoubtedly an intriguing and well-built design. I must admit, however, that I didn’t find DX Labs’ claims concerning the elimination of “thermodynamic” and “multipath” distortions to be borne out. Or, rather, the 17S suffers from conventional loudspeaker ailments to a large enough extent that the elimination of what I consider can only be minor problems has no bearing on its ultimate sound quality, which is definitely below average. At its above-average price, this loudspeaker cannot be recommended.

**Quadrant Q-250: $695**

New to the US, this unusual Canadian loudspeaker is imported by Audiophile Accessories of Butler, PA. The drive-unit complement is traditional—a 1" soft-dome tweeter, sourced from Vifa in Denmark, coupled with a reflex-loaded 8" plastic-cone woofer, with an inverted dust cap—but the cabinet is an eight-sided, truncated triangle in cross-section. Made from high-density particle board, its odd shape is said to minimize unwanted diffraction and internal standing-wave problems. In addition, the cabinet is filled with long-fiber wool. The woofer appears to be mounted from the rear of the front baffle, as no screw heads are visible; below it is the reflex port, this quite small at 1½" diameter.

Stands are supplied with the speakers, these being hollow eight-sided boxes, 10½"-high, echoing the 250’s cross-section. The stands screw into the base of the speaker, but the bases are not fitted with bushes for spikes. I suggest that it would be worthwhile filling these stands with sand, both to provide a more massy support for the speakers and to
eliminate any air-space resonant effects. Electrical connection is via my least-preferred method, spring clips, though these will accept slim 4mm plugs—Monster Xterminators were a very tight fit! The grille is heavy-framed, and places wooden strips in close proximity to the drive-units. Consequently, the auditioning was carried out with the grilles removed.

The sound: With the speakers positioned well away from the rear and side walls, my initial impression was very positive: the Q-250s produced a lively and open sound with plenty of low-frequency heft, and the sound was musical. Tonally, the 250 was reasonably neutral for a speaker in this price class, coloration being restricted to a slight “aww” effect in the upper midrange, which coupled with the bass quality to give a warm sound. The treble was rather unsubtle, though the over-bright presence-band peakiness commonly found with inexpensive tweeters was less apparent. The lower midrange was more problematical, however, as the sound of tenor instruments—the cello, for example—was both a little boxy and uneven with frequency. The lower register of the piano also was reproduced with uneven weight, some notes jumping forward in the image.

The bass itself was typically reflex, with good extension but an excess of energy in the midbass, followed by a lack of the same in the upper bass. Drums, for example, had plenty of impact, but were a little indistinct in the bottom two octaves and lacked upper-bass weight.

Stereo imaging was only average, central images being unstable with frequency. Good depth was apparent, however, though again, this was dependent on frequency.

Measurement: The spatially averaged in-room response peaked sharply in the bass, as do so many under-damped reflex designs, useful extension reaching a low 35Hz. Measured nearfield, the -6dB point ref. 100Hz lay at 27Hz! The overall in-room response was reasonably flat from the upper bass through the midrange to the treble, but there was a lack of energy from 200Hz to 800Hz, and too much in the top octave. The response showed quite a lot of vertical beaming, and the smoothest response was just above the tweeter axis, exactly where the custom stands place the listener’s ears.

Somewhat worrying was the distortion heard in the midrange, this at a not-very-loud 87dB level. In addition, despite the claimed advantages of the eight-sided cabinet, I found severe high-Q cabinet resonances at 205Hz and 410Hz, the cabinet quite literally shaking at the former frequency. These were also audible on pink noise, and it might not be coincidence that the positions of these resonances coincided with ½-octave noise bands that were depressed in level. The boxiness and unevenness heard on piano and cello tone are undoubtedly due to these problems.

Sensitivity appeared to be to specification at around 90dB/W/m, while the impedance averaged 8 ohms, dropping to a minimum of 6 ohms in the upper bass. The Q-250s should present no drive problems, even to tube amplifiers.

Conclusion: Though suffering from a few coloration problems, the Quadrant Q-250 offers a musically pleasing balance. It doesn’t excel in any one area, but as the whole is rather better than the sum of the parts and the price includes stands, it can be recommended.

Synthesis LM-210: $950

Synthesis is the loudspeaker company associated with conrad-johnson, who seem to be widening their focus away from esoterica toward affordable, high-quality products. The LM-210 loudspeaker is a case in point: introduced at the Summer CES in Chicago, it offers a lot of sound at a very competitive price. The elegant, floor-standing cabinet is constructed from MDF and veneered on all surfaces with oak, solid 1 ¼" oak being used for the radiused corners, and all surfaces are oiled and waxed. A small pedestal, threaded to take carpet-piercing spikes (supplied), conceals 4mm sockets located in the base, and the upper half of the baffle is angled back to bring the two drivers into time alignment. Unusual for this price level, the drivers stand proud of the baffle, the latter not being rebated. A black grille covers the drivers and ports, but as this built on a non-profiled frame, it was left off during the audition.

The drivers themselves are sourced from the Danish Vifa company, and consist of a 6.5" polypropylene-coned woofer and a 1" doped-fabric dome tweeter, the faceplate of which incorporates a very short, straight horn flare. The woofer is reflex-loaded with two 1 ¼"-diameter
ports, 3 ¼" deep, positioned to the lower edges of the tweeter. The crossover between the drivers is set at a low (for a 1" tweeter) 1.5kHz; this places uncommon demands on the tweeter: to have a low fundamental resonance, and to be able to handle highish powers at the bottom end of its range. The benefit gained is that many woofers tend to have an audible break-up mode around 2.5kHz, where the ear is at its most sensitive; crossing over to the tweeter below this frequency will (hopefully) minimize any audible problems due to this.

All internal wiring is with a cable chosen after listening to over a dozen different types, and connection to the drive-units is via soldered joints. The crossover is mounted in the speaker's base and, according to Synthesis's David Fokos, is the single most expensive element in the 210. High-quality components are used: air-cored inductors and polypropylene-dielectric capacitors bypassed with polystyrenes, these the renowned conrad-johnson caps used in their c-j, Motif, and Sonographe electronics. Second-order slopes are used for both filter legs, and, most unusually, the filter functions are Bessel-type. Almost all crossovers are based on Butterworth filters, where a flat pass-band response and rapid achievement of the ultimate rejection slope out of band are traded against a certain amount of ringing in the time domain. The Bessel filter is rare in crossovers because it starts to roll off very slowly, something generally seen as counterproductive in a crossover design, where you need to attenuate the unwanted driver's output as soon as possible.

What it does have going for it, however, is that, unlike the ubiquitous Butterworth filter, where the higher the order (ie, the steeper the slopes), the worse the phase response and the more pronounced the ringing, the Bessel is basically linear-phase, with a concomitant lack of ringing. It is for this reason that it is so widely used as the analog low-pass filter for 4xoversampling CD players. When used for a crossover, the initial 6dB/octave slope means that the drive-units must be chosen with care. They will still be contributing significant output an octave above or below their nominal passband, so must be fundamentally free of severe resonances or peaks. An additional advantage accruing from the use of second-order Bessel filters is that their linear phase characteristic avoids the suckout in the crossover region with second-order Butterworth filters when the drivers are connected in phase. Usually in this case, the tweeter is connected out of phase with the woofer to avoid the suckout, but this leads to complications elsewhere in the range. The LM-210’s use of Bessel filters means that the drivers can be connected in phase, yet retain a flat amplitude response.
The sound: The immediate impression was how well the LM-210s reproduced the dynamic ebb and musical flow. Whether it was the contrast between piano and forte on James Boyk’s recording of the Beethoven “Pathétique,” or the way quiet instruments could be distinguished in the presence of louder, as on the Denon Ein Heldenleben CD (good sound and a good performance), the LM-210s resolve dynamic detail to a standard typical of more expensive speakers. Soundstaging, too, was very good, if not quite up to the holographic standards set by the Celestion SL600. There was never any sense of the sound being localized in the speaker positions. The piano image on my Chopin recording on the HFN/RR Test CD was accurately positioned within the surrounding ambience, while central images were narrow and stable with frequency, always a good sign. Depth was well-defined, with the difference between real and artificial reverberation clearly audible. You could easily “hear the walls” on the HFN/RR drum recording.

Tonally, the bass had good weight, though it was a little loose in quality, bass drum and guitar having just a little too much overhang. On pink noise, the sound was quite smooth, though the bass was still a little under-damped and there was a slight mid-treble emphasis. The cabinet seemed well-damped, apart from a single resonance around 240Hz. String tone was excellent. Overall, the midrange was clean, with instrumental tones well-reproduced, though there was a slight “aw” coloration—oboe took on a little of the tonal quality of the oboe d’amore—coupled with an occasional hardness to vocal sound. Voices also sounded slightly small, lacking a little chest tone, but weren’t given any sibilance emphasis by the slight mid-treble lift. High frequencies were clean, though slightly bright on the tweeter axis; as explained later, I found the best listening position to be with the speakers firing straight ahead rather than toed-in.

With CD, I got the impression that the extreme HF octave was a little reticent, leading to a slightly shut-in quality. LP replay was OK, however, with apparently a full measure of high frequencies. This appears to be a paradox, with popular opinion holding that CD tends to have an overgenerous helping of HF. Alvin Gold has postulated in these pages, however, that CD replay lacks high-frequency information and that a good system will reveal this to be the case. Certainly this ties in with my experience with the LM-210, where analog disc sounded sparkling and musical in the treble. Couple the LM-210s with a typical MC cartridge and you have a musically satisfying and informative combination.

Measurement: Measured nearfield, the low bass extended to an astonishing 29Hz, rolling off rapidly below that frequency. The Synthesis design team has obviously chosen to go for extension rather than sensitivity for the given box size, as the LM-210 appeared only to have a sensitivity of 87 dB/W/m, around 4dB more than the Celestion SL600. This will not be a problem given sufficient driving urge, from a 50W or greater amplifier.

In-room, the spatially averaged response peaked at 40Hz, giving effective extension to 35Hz (though there was quite a lot of distortion in this region), but rolled off rapidly below, suggesting a highish Q to the reflex alignment (though the bass did not have any one-note character). The overall response was very flat indeed, ± 1.7dB limits sufficing from 125Hz to 2.5kHz, with superb ± 0.25dB limits applying to the upper midrange octaves above 630Hz. There was a slight lack of energy in the upper bass and in the midrange around 600Hz, while a small peak at 6.3kHz worsened on the tweeter axis. Apart from that peak, the response was smooth on this axis, but showed a gently rising trend of some 4dB from 60Hz to 5kHz. Overall therefore, I found the most neutral response to be with the speakers firing straight ahead, so that the listening position was around 20° off-axis laterally, and just under the tweeter axis vertically. Unusually, distortion could be heard on ¼-octave pink noise at the 315-630Hz octave, probably correlating with the slight hardness occasionally noticeable on voice.

The modulus of impedance showed the twin peaks in the bass characteristic of a reflex design, reaching maxima of 23 and 31 ohms at 24Hz and 55Hz respectively, and didn’t drop below 6.5 ohms. The LM-210 should present amplifiers with an easy load, and would be a good match with tube amplifiers (though the slightly loose nature of its bass means that tube amplifiers with a similar LF signature—the Dynaco ST70, for example—should be avoided).

Conclusion: Offering excellent sound quality and finish at an affordable price, the LM-210
will work well in both inexpensive systems and those featuring state-of-the-art gear. Coloration and tonal balance problems are minor, and Synthesis has done a fine job in balancing the necessary compromises. Given my druthers, I would have liked a slightly drier bass alignment; having said that, however, I doubt if many audiophiles would be bothered by the 210’s slightly rich low-frequency balance. Recommended.

Overall Conclusion

Two out of the three models I reviewed this month find their way into my personal list of recommended affordable loudspeakers having pretensions toward a neutral sound. The list, in order of price per pair—but only approximately of merit—now consists of: Vandersteen 2C ($1150), Spendor SPI ($950), Synthesis LM-210 ($950), Thiel CS1 ($950), Celestion SL6S ($900), Monitor Audio R652MD ($859), Siefert Magnum III ($833), AR 35T ($700), Quadrant Q-250 ($695), and Spendor SP2 ($650). To be considered by those on a more restricted budget are the Siefert Maxim IIIID ($599), JBL 18Ti ($590), Monitor Audio R352 ($559), Magnepan SMGa ($495), Spica TC50 ($450), and Spendor/Rogers LS3/5A ($450). The Thiel, Synthesis, and Magnepan designs represent particularly good value as, being floor-standing models, they obviate the need for suitable stands (which can run to another $150).

ONIX BWD1 FM TUNER

Don Scott


I have looked at a number of British FM tuners in the past couple of years, the Mission Cyrus being the most selective, the Arcam Alpha and Quad FM4 offering the best sound. The Onix BWD1 came to my attention at the 1987 Summer CES. It sounded good in Chicago, so I asked for a loan sample in order to see if it would do so in Connecticut—it did.

Similar to the styling concept featured by Mission, the Onix BWD1 is approximately one-and-a-half times as deep as it is wide. A Plain-Jane, varactor-tuned analog tuner, it features a complete lack of bells and whistles, apart from two knobs on the front panel. The left-hand knob has three positions: Auto (wide IF bandwidth, muting, AFC except when tuning); DX (same as Auto, apart from no muting); and Narrow (increased selectivity, no muting, and a slight drop in sensitivity). The right-hand knob is for station tuning. A five-digit display occupies the center of the panel, with a red stereo light and the “MHz” illuminating to indicate center tuning. There’s no on/off switch, which could be a problem when the tuner is used with other than the matching Onix integrated amplifier, its AC lead ending in a nonstandard plug. (The Onix amp sounds good, too.)

The rear panel has a jack for the separate power supply and both DIN and standard audio and antenna connectors. There is also a 10dB antenna attenuator fitted, which would be useful in strong signal-strength areas. The interior construction is a work of art, although no unusual circuits are used. Perhaps the BWD1 is too simple.

What Onix refers to as “narrow” bandwidth is about normal for a good Japanese tuner.

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Adjacent-channel selectivity reaches a maximum of 10dB, alternate-channel 70dB. This translates as an RF performance slightly better than el cheapo tuners, but not much. A directional antenna will be needed to receive adjacent stations successfully if one is 20% stronger than the other. Capture ratio is slightly below 1dB, weaker signals on the same frequency being quite well suppressed.

The BWD1 is far more sensitive than expected, measuring a respectable 1.8uV/10.3dBf usable sensitivity at 96.9MHz, though slightly less at the frequency extremes. Stereo 50dB quieting is outstanding at 27uV/33.8dBf, allowing quiet stereo reception of low-powered stations that would otherwise require some kind of noise reduction/high-blend to be acceptable. (See the review of the Harman/Kardon Citation 23 elsewhere in this issue for further ways of enhancing fringe reception.)

IHF ±75kHz distortion is .05% stereo wideband, 1.3% narrow. Below ±40kHz deviation, distortion measured 0.1% in stereo wideband mode, rising to 0.8-1.2% in narrow mode under the same conditions. The Citation 23, Luxman T-02, and Yamaha T-85 have lower distortion in their narrow modes, but in practical use, with stations already having high levels of distortion, the BWD1 sounded better. The filtering action of narrow operation is a good tradeoff, in my opinion. All other specifications were typical, and were not outstanding.

Audio Quality
The fact that the power supply is physically separate undoubtedly contributes to the Onix tuner's excellent S/N ratios, both RF- and audio-wise. On classical stations with normally low modulation levels, the BWD1 seems to recover extra bits of information that seem to make the tuner transparent to the music source: voice characterization, low-level CD information and, of course, LP scratches and clicks are all reproduced with excellent verisimilitude. Stereo separation is not overwhelming, but there is a good sense of the proper location and definition of instruments. Both low- and high-frequency responses are extended, deep organ and delicate treble passages being exceptionally reproduced (though there is a slight —1dB—of chestiness around 250Hz).

On the negative side, the BWD1 does not do very well on heavily modulated rock or popular-music stations, presumably because the IF bandpass characteristics become more nonlinear with wider bandpass requirements. (The Bogen TP-100 does very well in this situation.) Nor is the Onix as clean as the H/K Citation 23, Yamaha T-85, or Carver TX-11A on stations that carry SCA modulation. No birdies were heard, but there was a slight increase in audio intermodulation distortion.

However, what we have here in the Onix BWD1 is a tuner that works best on properly engineered classical stations that don't broadcast SCAs, a bill fitting many public, college, and religious stations.

Conclusion
I wish that British engineers would design a tuner specifically for the crowded RF spectrum in North America, rather than hope, as they seem to do, that their successful domestic model will be OK. Such a design would ensure that there would be more British and less Japanese tuners on dealers' shelves. The Onix, for example, has hit a few things right on the button, but not all of them. However, if you have a good-quality station in your area that refrains from over-modulation and doesn't carry SCAs, the BWD1 will be well worth an audition. You will be pleased with its sound, despite its rather high price tag.

HARMAN / KARDON CITATION 23 FM TUNER

Don Scott

Pioneering audio companies can't live on their past glories forever. Eventually, stiff competition steals away the nostalgic buyers and the company loses its share of market dollars. Along with Marantz, Bogen, Bozak, and a few other old-timers, Harman/Kardon is now producing a range of products intended to help the company regain some of its former recognition. The Citation 23 tuner is just such a product; though there are still a few feathers in need of pruning, H/K can strut its stuff over it.

In some ways reminiscent of the Magnum/Dynalab FT101, the Citation 23's appearance has a hint of the antique. From left to right, the front panel features the on/off switch, memory controls for the 16 presets, wide/narrow IF bandwidth switch, with an accompanying center-frequency control for precise narrow tuning, mute on/off, FM/AM/mono and scan controls, and the main tuning control. Near the center of the panel is the four-digit frequency display, with a five-segment signal-strength meter and fine-tuning indicator below. The rear panel carries fixed and variable output jacks, the variable muting level control, and antenna connectors. The Citation 23 includes remote control for good measure.

A primary design criterion for the Citation 23 was to have superb selectivity without a concomitant increase in distortion and loss of stereo subcarrier sidebands. With a zero-modulation FM-signal broadcast, the carrier frequency is at rest at its nominal center value. When modulated with an audio signal, the center frequency fluctuates at the audio frequency between a maximum of ±75kHz (or ±100kHz for stations with two SCAs). Conventionally, an IF bandpass filter passes the ±75kHz modulation; H/K's approach is to gain selectivity by restricting the oscillator window so that deviations greater than ±80kHz are rejected. This technique has been used in specialized military receivers, but never in domestic products. Like the ADS T2, the Citation 23 also provides precise, analog-type tuning in its narrow mode; this aids both effective selectivity and the optimum tuning of nonstandard cable FM frequencies for minimum distortion.

Good RF selectivity is also aided by an additional filter stage when in narrow mode. Four ceramic filters are used in the IF strip; normally, these would create excessive phase shift, resulting in distortion. In the 23, a phase comparator looks at the distorted waveform and corrects against a fixed standard—a neat trick which works well. (Yamaha's T-85 uses a somewhat similar circuit in its super-narrow mode, but this is intended to shift a portion of the 10.7MHz IF strip to match low-tolerance ceramic filters and to center-tune exactly for the lowest distortion in production.)

**Measurements**

Harman/Kardon claims 30dB adjacent-channel selectivity for the Citation 23. I could actually measure 40-50dB with the aid of the fine-tuning control. This makes the 23 one of the most selective tuners ever manufactured, in the same league as the McIntosh MR-78 and '80, Kenwood 600-T, Sansui TX-1 and TU-9900, Onkyo T-9090 and 4087, Mission Cyrus, Technics ST-G7, and Yamaha T85.

SCA rejection was in excess of 80dB, and no birdies could be heard. This may, in part, be
due to the fact that SCA sideband garbage greater than ±80kHz deviation is rejected. All
the other claimed and measured specifications
were superb, with one exception—sensitivity.
Usable sensitivity of 3μV/14.7dBf in mono and
38uV/40dBf for 50dB stereo quieting in the
narrow mode is shameful.1 Compounding the
unsatisfactory sensitivity is the absence of any
kind of noise reduction. The 23 must be used
in good reception areas, or with an excellent
aerial, to give low noise. Fortunately, there
are many reception areas where good selectiv-
ity is of greater importance than the ultimate
sensitivity.

If you do need sensitivity, what can be
done? A 26dB RF kick in the butt with the
Magnum/Dynalab 205 RF amplifier (review-
ed in Vol.10 No.6) brings the Citation 23 alive,
the combination unbeatable for distant adjacent-
channel mono reception. Quiet stereo recep-
tion, however, is difficult, even with boosted
RF signal levels, because RF noise will also be
boosted in level. One suggestion is to put
together an outboard high-brend circuit,
reducing stereo separation at high frequencies
so that the noise (which will be in opposite
polarity in the two channels) will cancel.
All that is required is a 10k pot in series with
a switch and a 47nF-100nF capacitor placed
across the hot conductor of each audio lead.
The switch removes the bridge from the cir-
cuit; the pot varies the amount of high-
frequency blend. Exact values will depend
on taste, the amount of separation one is willing
to give up, and the impedance the tuner is
looking into. A combination of a good anten-
a, the Citation 23, the Magnum RF booster,
and such a home-brew high-brend circuit
would be a potent means of receiving in ac-
ceptable stereo that elusive good music station
that always seems to be splattered by some
undesirable stronger signal.

While I'm in a picky mood, however... the
Citation 23 cannot be locked into its narrow
mode. The narrow button must be pressed on
each power-up or station change. H/K's engi-
neers argue that because each station tuned in
narrow mode might require a slightly off-
center tuning, if the narrow mode was left in,
a user might mistakenly think that it wasn't
possible to receive that particular station clearly.

My answer to that, however, would be to
ask why the circuit status couldn't at least
be kept when the tuner was unpowered/re-
powered, and the narrow mode included in
the memory/preset data. In addition, the 23
has no provision for switching into narrow
mode by remote control unless you throw the
remote at the appropriate selector button; I
find this exclusion quite annoying.

FM sound quality
The strength of the Citation 23 is that it main-
tains excellent stereo performance despite its
narrow IF bandwidth. Normally, distortion
will be higher in a tuner's narrow mode, but
with the Citation 23, the opposite is the case;
the limited bandwidth acting as a filter to atten-
uate the high-frequency trash often broadcast
from strong, heavily modulated rock stations.
There are better-sounding tuners than the 23
in its wide mode, some costing less money—
Bogen TP100 ($179), NEC T-6E ($229), Arcam
Alpha ($299), Marantz ST551 ($300), Quad FM4
($595), Onix ($775)—but this is not to say that
the 23 disappoints here. It does have a fairly
clean midrange and HF region. The low frequen-
cies, however, lack solid extension, the bass soft-
ly "wamping" a little. However, if a tuner doesn't
have the RF performance to receive a station
with good fidelity, whether its sound quality is
good or not is irrelevant. That's what the Cita-
tion 23 is all about: it can separate closely spaced
stations where others fail.

AM section
Nice. Sensitivity is not outstanding, being only
slightly above average at 275uV/m. However, the
sound is exceptionally clean, with good, extend-
ed bass, and enough balanced highs to allow
listening without undue low-fi stress.

Conclusion
The Citation 23 is not the tuner for Everyman,
but it can be recommended for use in strong
signal areas where good selectivity is required,
but for fringe reception areas, its sensitivity is too
low, some kind of RF amplification being
necessary to allow it to perform at its best. Its on-
ly competition in current production is the
similarly priced Onkyo T-9090 and the now
nearly $2000 Tandberg 3001A. For less demand-
ing situations requiring above-the-norm selec-
tivity, the Nikko NT-950 ($259) is an excellent
performance/dollar choice.

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1 H/K acknowledges this problem, and promises more RF
soup in the next generation of the 23, though this will not
appear for some time.
Ambico V-0602 IR Receiver system


Ambico is a company specializing in video accessories: special-effects lens attachments, lights, tripods, film-to-video transfer, carrying bags, etc. At the SCES last July, however, they displayed wireless mikes and wireless PA systems, among which was the intriguing V-0602 headphone system, being demonstrated with a CD player. It sounded respectable! Consequently, I requested a sample for review.

Transmitter
The transmitting unit has an array of 12 infrared LEDs in a 110° arc across its 7¾"-wide front panel. These are modulated with the audio signal. An attached 6.5' cord carries a ¼" stereo mini jack (a ¼" adaptor is supplied) for connection to the headphone output of the CD player, receiver, or amplifier with which the unit is to be used. The transmitter doesn't have any kind of level control, something I would like to see included: maximum input level before the overload LED flashes is a mere 250-300uV. Audio input or initial power-up starts the transmitter; if the V-0602 doesn't sense an audio input for 60-90 seconds, it shuts down automatically to avoid overheating. The power supply can also be used to recharge Ni-Cad cells for the receiver.

Receiver
This is best described as a small, Walkman-like device. It has a 360° pick-up pattern, and contains left and right volume controls, an on/off switch, and a switch with "normal" (batterysaver) and "dynamic enhancement" positions. The latter apparently increases the output stage bias to allow for more output. Headphones plug into a standard ¼" stereo mini-jack socket.
Results
With the receiver switch set to "dynamic enhancement," full input before clipping on the transmitter, and a good pair of headphones, I experienced little or no degradation within a 25' range when compared with the sound with the headphones plugged straight in. For all practical purposes, the Ambico V-0602 appears to be fairly transparent. It has enough level and dynamic headroom for CD listening—and the infra-red transmitter doubles as a good hand-warmer. Recommended for those who, for whatever reason, must use headphones for their serious listening.

ACCESSORIES FOR EVERYMAN

J. Gordon Holt

Record Clamps
Although a number of people have reported "improvements" in sound when using one or another variety of record clamp or disc stabilizer, my experience with them has been that their effects are very iffy. Yes, they do change the sound somewhat, but whether or not the change is for the better is a matter of taste.

The fact of the matter, though, is that most such clamps have an effect which, by all rights, should be detrimental to the sound, not beneficial: They tend to lift the outer edges of the disc off the perimeter of the platter mat, allowing the entire disc surface to ring uncontrollably. They do this because all platter mats (and 'tables without mats) have a depression in the center to accommodate the extra thickness of the label; when the center of the disc is pressed downward by a "stabilizer," the rim of that depression tends to dish the disc downward, raising its edges.

It's easy enough to check the effect of this upward dishing. Put a disc on the platter (making sure it isn't permanently diced to start with), turn the volume up to where you normally listen, and place the stylus in an outer groove of the stationary disc. Gently tap the opposite edge of the disc with your fingertip and listen to the sound that comes through the speakers. Then add the stabilizer and repeat the test. Usually, the BOOM of the undamped disc surface will be more pronounced with the stabilizer in place, indicating reduced damping of the disc surface; this added boominess will impair LF detail when listening to records.

The only kind of record clamp that really does the job is the kind where a small washer around the spindle and under the record label acts against a label-sized clamp to push the periphery of the disc downward rather than upward (like SOTA's Reflex Clamp). All other record clamps are of dubious utility.

Decca Record Brush
After having used a succession of these for routine pre-play dust removal for some years, I recently installed a high-intensity work light above my turntable, and immediately discovered the brush wasn't working the way it should.

Most of the surface dust was being deposited in the grooves rather than lifted out by the brush bristles. But what, I wondered, might do a better job? Then I remembered a pair of plush-surface pads I had that had come with a dispenser of Gruv-Glide. I tried one of these, dry, and was a little surprised to see that it removed a lot more dust than the carbon-fiber brush had. Then I tried dampening it (soaking it under a faucet and then wringing it out), and found that it removed every visible trace of detritus from the grooves. Ever since then, I have found that new discs accumulate surface noise much more gradually than they used to. Hmmmm . . .

I have thrown out the Decca brush, and will continue to use a dampened plush pad in future.

Interestingly, the very first marketed record cleaners were plush pads just like the one I am now using, only smaller. Not all progress is, it would seem, in a forward direction!

CD CarryDisc
Now, here's a clever idea. The CarryDisc is a heavy fabric folder, containing six hinged sleeves faced with pockets, for holding CDs (minus their jewel boxes). For temporary
storage only, the CarryDisc accommodates up to 14 discs, nesting each between a soft, plush-like backing and a soft, clear-plastic cover. The clear plastic, of course, allows you to read the label of each disc, and a large center hole and radial slot in each plastic overlay makes it easy to slide out any desired disc. It's perfect for taking along a selection of CDs in the car or to a motel or summer cottage, but since the thing holds up to 16 hours of music and the average portable CD player won't do more than two hours on a charge, the CarryDisc doesn't make sense for hiking or jogging. (And it doesn't have a belt strap on it anyway.) It's perfect, though, for those trips away from home when you'll have access to an AC supply or a cigarette-lighter outlet.

I have only three misgivings about it: First, my sample was rather shoddily made, with a bad crease in one plastic sheath that was immortalized by being stitched-in to the border seam. Second, I can see no way of cleaning the plush backing surfaces when they start to accumulate dust. (They do a fine job of cleaning the playing side of a disc each time you slide it in, but the dust stays there when you slide it out.) And third, I can foresee beach sand on the playing surface gouging it all up when you slide a contaminated disc into its sleeve.

A little care will prevent damage from sand, although it is my contention that delicate mechanical devices like CD players don't belong at the beach anyway. But, aside from my other two reservations, I think this is a good idea, well executed, and cheap enough at $15.95 that you could well consider buying several of them, replacing them as they get dirty.

If you can't find CarryDisc locally, you can phone in a credit-card order to (800) 331-4315, or (in Pennsylvania) (215) 357-7858. Their address is CarryDisc, PO Box 1463, Southampton, PA 18966.

**Nagaoka CD Cleaner**

Putting the question of scratches to one side for a moment, cleaning a CD is one of the easiest things imaginable. You take a soft cloth (or, better still, a Kleenex-type facial tissue), moisten it with water, and gently wipe the playing surface of the disc, from label to perimeter. The direction of wipe is the only important thing. A circular wipe may leave streaks or scratches in line with the "grooves," which will result in uncorrectable losses of data and confuse the tracking system. Finally, you use a soft, dry cloth to buff away any remaining water stains, again wiping always from label to outer edge.

That's all there is to it, unless there happens to be a speck of dirt on the surface that isn't water-soluble, in which case you can gently scrape it off with your fingernail—again, in a radial direction. For grease, diluted liquid dish detergent does just fine.

So what purpose does a dedicated CD cleaner like this serve? As far as I can tell, absolutely none. Devices like this are a solution seeking a problem, and there is no problem. Enough said.

**CD Saver**

CD Saver is a rather revolting-looking gunk that you smear on a CD scratch, allow to dry, and then rub off with "a soft cloth." If the scratch is relatively minor, it disappears. You need a strong magnifier to see what's left of it. If the scratch is severe, it does not vanish, but it does become much less visible, to the eye or to the CD player's laser beam. In other words, this stuff works. But is it a miracle? No, it's a buffer; a very fine-grade abrasive suspended in a petroleum-based carrier fluid. What it does is remove the sharp corners and edges of a surface scratch, reducing light-scattering and, presumably, burst errors.

In my opinion, however, it is of dubious value in CD reproduction. Most players are more than able to correct, perfectly, for data losses due to scratches of truly appalling magnitude. Only those scratches which approximate the path of the data track, thus obscuring many digital words, are likely to cause audible problems, and these are the only ones on which CD Saver is likely to have any effect on sound quality.

What CD Saver *is* amazingly effective for is the LV. LaserVision discs use the same recording format as CDs, but the information is in analog form, and there is no playback error correction at all. A scratch on an LV disc shows up as a brief streak on the screen or, if it's bad enough, also as a click in the audio. For abused LVs, CD Saver is a Life Saver.

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Liszt completed his B minor Sonata in Weimar in 1853, during a time of great creative productivity. He dedicated it to Robert Schumann in acknowledgement of his C major Fantasy. The high opinion that these two composers had once had of each other was already deteriorating by this time, however, and the Sonata's radical departure from classical constraints of form and key, and its emotive musical language, alienated it not only from Schumann, his wife Clara, and their friend Brahms, but also from the great following of Schumann disciples. It was not until 1857 that it was given its premiere by Liszt's former pupil Hans von Bulow, in Berlin. It is not difficult to understand why it was poorly received by audiences more familiar with the shorter, dazzling, virtuosic sweetmeats given by the maestro himself during his extensive concert tours of the preceding years, for the Sonata is an intense, original, and powerful work of about 30 minutes' duration, contracting first movement sonata-form and the separate movements of a Sonata into a one-movement structure based on the constant reshaping, intensification, and transformation of four main themes. Liszt's inspiration for this was probably Schubert's Wanderer Fantasy, with its four connected movements intent on the constant metamorphosis of a single theme, but the Sonata still remains one of the most original post-Beethovenian piano works for its concision and unification.

There will always be as many widely differing interpretations of this multi-faceted work as it has performances, and this is borne out by the many more or less successful recordings of it that have passed through the catalog.
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since Horowitz’s revelatory account of 1932. This performance is now available in Keith Hardwick’s much cleaned up though still, by today’s standards, uncompetitive mono recording taken from the original 78s (EMI References 1001001). If Horowitz seems here, in the light of his younger contemporaries’ performances, to rush his fences (this reading is a good 3½ minutes shorter than most of its rivals) and cast little light on the work’s grand architectural structure, he does show great understanding and sensitivity in some of the work’s more poetic moments. His 1977 interpretation (recently reissued on RCA RD 85935, in an uncomfortably close recording) is much more spacious and rhapsodic, but is also full of eccentric mannerisms. Right from the mysterious *Lento* introductory theme, which he will not allow to be *sotto voce* here or *ppp* in the coda, he forces notes to leap out unnecessarily from the score. The way he throws himself headlong into the white-hot *prestissimo* octaves before the coda is impressive in its commitment, if rather less so in its accuracy, and can only be compared to the risks taken by Andre Watts (EMI EL 27 0400 1), whose whole performance seems to build, in retrospect, to this point, and by Francois-Rene Duchable, whose immaculate precision and breathtaking dexterity also stumble at this same point (Erato ECD 88091).

Another masterly octogenarian, Claudio Arrau, is, like Horowitz, still represented in the catalog, now on LP (Phillips 416 6681) in a well-recorded reissue performance from 1970. From the introductory theme, and the *allegro energico* first theme proper, with its leaping octaves and interval of a seventh, followed six bars later by a menacing, repeated-note motif in the bass, Arrau’s deliberate and purposeful nobility commands attention. But it does not generate the incredible excitement and feeling of irresistible force that powers the music forward in Cecile Ousset’s performance (EMI CDC 747 5142). Her arrival at the massive *ff* *Grandioso* “second subject” after this passage seems an inevitable climax, whereas for Arrau it demands solid, philosophical building, with uncalled-for, but characteristic, moments of hiatus and burdening of tempo to underline certain salient points. But Arrau is unsurpassed in the fragility and love of the *dolce con grazia* leading to the beautiful, yearning *cantando espressivo* theme, that in its complete transfor-

mation of character can barely be recognized as the repeated note motif of the opening. Here he finds moments of repose and tranquility that none of his rivals can emulate, although the young Canadian Louis Lortie (CD: CHAN 8548) has an appealing warmth and lyricism that is at this point enhanced by an over-reverberant acoustic that stifles faster- passage work. Both artists are equally spell-binding in the new fourth theme of the *Andante sostenuto* (quasi middle movement) development, and here too, Andre Watts is captivating in the wonderful calm he creates, realizing exactly Liszt’s hauntingly beautiful *ppp, dolcissimo con intimo sentimento* passage that follows shortly afterward.

Cecile Ousset is as persuasive at these more gently seductive moments, although the intensity of her emotion is never allowed to relax, and one still senses the building threat that eventually bursts out with an unpleasant hardening of tone in the thundering *pontissimo* preceding the coda. Arrau here sounds undignified in his haste and the coda is uneasy, unsettled, as if he cannot let go of the music or let it rest. I find his demand for the complete subservience of the work unacceptable, although there is so much to admire in his performance. His latest “thoughts” on the piece are to be released later this year, and I await them with optimism.

It is inevitable that such a virtuosic work will appeal to some performers more for its transcendental technical demands than its conceptual integration and stature. Jorge Bolet’s account (Decca CD: 410 115-2) makes one appreciate the technique required—his audience is to stand back and admire: the pointing and voicing of the *fugato*, the rapid succession of double octaves, the fine articulation. Earl Wild, too, including this work on the first of three double albums of Liszt pieces entitled *Liszt the Virtuoso* (Ectetera ETC 2010), clearly signals his interpretive stance, his fingers still capable of extreme agility and great delicacy of touch, but without the weight to blend these passages with those of more menacing rhetoric into a cohesive whole. It is interesting that he also alters details of the score, in the way Liszt himself was wont to do in the compositions of others. Duchable has similarly found in this piece a vehicle to display his astoundingly controlled but thrilling technique; his performance makes great dramatic impact, but in the

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FEATURING:
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final reckoning it fails to realize the Sonata's structural strengths.

No less virtuosic in technique, but treating the Sonata with greater respect and allowing it to speak for itself, is Alfred Brendel. His interpretation is a lesson in anatomy—the body is laid upon the table, the vital organs are identified and labeled, and their interrelating functions explained. This makes his approach somewhat clinical and aseptic but, by refusing to dress the work up, the complexities of its structure and its harmonic integration become all the more apparent. His now deleted 1964 recording on Turnabout (TV 3432) is intellectually stunning, if emotionally sterile in places. The stillness of the opening theme is magical, the Grandioso is heroic, and the fugato menacingly portentous and sinister in the forward thrust of its building climax. With the stretta quasi presto and the notorious final prestissimo, the notes fall over themselves in their drive to be released, and all is peacefully resolved in the most extraordinary, breathtaking tranquility of the coda. No one can surpass Brendel here in his ability to let the piece end without superfluous imposition. If only his tonal color could have been softened a little for the more lyrically persuasive moments, this reading would unequivocally take the lead from all others.

He seems to have recognized this weakness, as his '80s performance for Philips (CD: 410 040-2) is certainly more emotionally satisfying and engrossing at these points, although some zest in the declamatory passages, and precision of articulation, seem to have been lost. But in both recordings, the complete calm and acceptance of the delicate Andante sostenuto is wholly beguiling, and Brendel presents a very convincing argument for making the main climax of the piece occur in this "development" section, a possibility that his rivals seem, without exception, to have overlooked. The sonic quality of the Philips CD is sadly disappointing: reverberant and hard-edged, it is no improvement on the drier but less fussy sound of the Turnabout issue.

This last would be my first choice; hopefully it will be reissued in the near future. In the interim, I recommend Brendel on Philips for his intellectual perceptiveness, although Ousset and Duchable may prove more exciting alternatives.

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**CASE STUDY: AUDIO CABLE ANATOMY**

**PATIENT:** A seemingly healthy, high-quality audio system.

**SYMPTOMS:** The patient appears to be suffering from a loss of subtlety, harmonic purity and lifelike dimensionality. Extreme high frequencies are diminished and upper midrange frequencies sound congested and irritated. Musical enjoyment is significantly impaired.

**DIAGNOSIS:** The patient’s cables have inadequate control of their electromagnetic fields due to a congenital design defect. The cable’s twisted conductors cannot fully contain the magnetic field of the music signal (Fig. 1). This induces a slowing down of high frequencies (PHASE SHIFT) and a tendency toward bloated lower extremities (malignant bass).

**CURE:** Immediate, radical cablectomy (removal of existing cables) followed by implantation of cables that uniformly contain the signal’s magnetic field. The best prescription — SYMMENTRICAL COAXIAL cables (Fig. 2) by STRAIGHT WIRE (The Music Conductor Series, LSI, and Ultra-Flex interconnect). NO GENERIC SUBSTITUTES WILL DO!
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CLASSICAL

BRUCKNER: Symphony 6
Wolfgang Sawallisch, Bavarian State Orchestra
Orfeo C 024821 A (CD). Gerhard Lamy, eng.; F. Axel Mehrle, prod. DDD. TT: 55:08

This is one of those recordings that slips into the catalog almost unnoticed: small label, second-rank orchestra, unfamiliar conductor. However, Sawallisch is quite well known in Europe. Here he brings to Bruckner a lightness and lyricism not usually associated with the Austrian composer. To be sure, the Sixth is Bruckner’s most lyrical, one might almost say sunny, symphony. In some hands, though, it can turn ponderous and too highly powered. I remember a Solti performance with the Chicago Symphony at Carnegie Hall in which the SPLs approached the threshold of pain. Sawallisch, then, is a welcome relief. And yet there is still something missing. The lyricism is here, but not the luminosity: the transcendent quality that the music can have, with the right conductor—like Gennady Rozhdestvensky (on a recent Melodiya LP with the USSR Ministry of Culture Symphony Orchestra). Sir Donald Tovey said of the second movement’s E major second subject: “Listen... with reverence, for the composer meant what he said, and he is speaking of sacred things.” Things which can be put into music, but not words. Rozhdestvensky conveys this; Sawallisch does not. And there’s the orchestra: The Dresden Staatskapelle with Eugen Jochum (on EMI/Angel, deleted) is a much better ensemble; and Jochum, too, gives the score the tender treatment it deserves; perhaps this will come out on EMI’s new mid-price Studio line of CDs. Or perhaps Mobile Fidelity will give us Rozhdestvensky. Meanwhile, you could do worse than Sawallisch on CD, and you might not, at the moment, be able to do better. The recording, by the way, is somewhat hazy, but atmospheric enough. The brass lacks bite. Strings could sound smoother (the orchestra or the recording?). Nevertheless, the music is allowed to live and breathe.

—TG
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The middle three of Mahler's nine numbered (and completed) symphonies include the greatest extremes found anywhere in all his work. Where 4, the smallest in orchestral scope, seems almost the work of a miniaturist when compared with the giants that flank it, 5 and 6 are large, forceful, and considerably louder, regardless of interpreter. Like a miniaturist, Mahler's scoring is much more detailed, even ornamental, in 4. There is a sense of relative relaxation, of his taking the time to fill in here, flesh out there. In 5 and 6, however, a far greater urgency streamlines the writing—though the orchestral forces called for are greater, the writing is simpler, stripped down; for the first time in Mahler, we hear substantial amounts of Wagnerian doubling of instrumental voices; the collections of solos are greatly reduced, and the orchestra speaks more as a single voice (especially in 6), for the first time playing as one vast instrument, rather than the uneasy, ever-shifting alliances of various chamber factions that ruled Symphonies 2, 3, and 4. There is a new authority in 5 and 6, a seriousness that does not belittle itself with the excess, digression, and hysteria of the earlier works. For the first time there is an unflinching rhythm through-line, a never-wavering drive that is a new thing under the Mahler sun. In 5 and 6, Mahler achieves full musical and spiritual maturity—much in the way Wagner's Ring, Tristan, Meistersinger, and Parsifal are fully mature in ways that Hollander, Tannhauser, and Lobengrin are not.

At first glance, Mahler's Symphony 1 would seem to be an anomaly. But that confident, assured piece is a "masterpiece" in the original sense: a piece with which an apprentice proves his ability to take his place with the masters of his craft. As much as it is the first step of adulthood, it is also the last step of adolescence. Certainly, the Mahler of 2 is a considerably more shaken soul.

The Fourth occupies an odd place in this pantheon: even its composition—written backward, as it were, from the last movement, that movement itself a leftover from the already sprawling Third—speaks of pastiche, recycling, the assemblage of afterthought. It sounds as if something written at when the composer had the time, not—like 5 and 6, even 2—something that demanded to be born. If Mahler posited a Nietzschean hero in 1, buried and resurrected him in 2, then thoroughly pantheized him in 3, 4 is that hero's summer afternoon dream. No matter the metaphor, 4 is definitely of smaller scale.

It was with astonishment, then, that I heard Eliahu Inbal's recording of 4 with the Frankfurt Radio Symphony Orchestra and Helen Donath. JA and I, having listened to Inbal's readings of 1, 2, and 3 (see my review in Vol.10 No.7), and being, on the whole, dissatisfied (though fascinated) with his consistently chamber-like interpretations, were looking forward to his recording of 4. If nowhere else, we thought, his unique perspective would find a home in this most chamber-like of Mahler's symphonies. Imagine my surprise, then, when Inbal, instead of reducing the scale as he did with the previous three symphonies, here actually expands it! Of the first four symphonies, Inbal makes 4 sound by far the largest, the most passionate, the biggest-scored. Quite an accomplishment.

Even more remarkable, it works. The Viennese sweetness usually associated with this work becomes, in Inbal's hands, a veritable sumptuousness, a four-part reverie of strong, but tender, passion. The FRSO, for the first time, sounds full-throated, not stretched thin, and the first-chair horn seems cured of the wateriness that dogged him throughout the first three symphonies. The devil-dance second movement's solo violin is a bit more of a lullaby here, however; the violinist seems to be actively working against the bilious, semitone-higher tuning requested by Mahler. The result is a leveling of the sourness that should properly pervade this movement (and which is given tart testament in Solti's recording with the Concertgebouw). Other than that, I have no quarrels with this interpretation.

Throughout the symphony, Inbal pays particular attention to the various glissandi and smears in the string parts, ritardando and leaning into them to such degree that, in three cases, I repeated passages several times to assure myself that I wasn't hearing machine noises, whirring electronics, or distant sirens from outside my house or the recording venue (Frankfurt's Alte Oper). I wasn't. Four minutes into the third movement (just before Wieder gemaechlichter), for example, is a run on the celli that I had never even heard before, and which Inbal makes virtually the point of the passage. Disconcerting—I'm still getting used to it. The only trouble with so highlighting the smears is that the FRSO strings do not execute them with the required smoothness—register leaps abound. Too, the violins have trouble
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holding the harmonics in the final chord of the third movement.

That movement segues here into the last, as Mahler intended (and as few conductors condescend to do). Helen Donath does the best job I have ever heard in terms of sheer vocal production (recordings of this symphony seem plagued by second-rate sopranos), although she does not capture the childlike spirit, so essential to the text, that Reri Grist did in the 1960 Bernstein/NYPO version (CBS). But for simply beautiful singing, this is the one.

Other recordings outshine Inbal's in individual moments: Abbado/VPO (DG), in the third movement, brings out every drop of Tristan, accentuates the gorgeous wind writing, and, with his slower than usual pace, brings the symmetry into true Mahlerian emotional—if not sonic—scale; conversely, the afore-mentioned Bernstein/NYPO reading of the final movement works best because of its brisk tempo (the fastest I've heard) and childlike brightness and lightness; the Solti/Concertgebouw is very satisfying in the first two movements, a remarkable balance of sweet and bitter (his second movement the only version that sounds truly sinister). But for a definitive, unified, balanced overall interpretation, it's the Inbal.

But with 5, it's back to Inbal's now-usual problems. In gemessenem Schritt ("in measured pace"), says Mahler's note for the first-movement funeral march. "Measured" Inbal is not: his Trauermarsch is halting, faltering, lugubrious, with little of the nobility so evident in the score or, for example, Solti's CSO recording. In addition, Inbal's limping dolor fragments the music to such an extent that any sense of cohesion or momentum is lost. The second movement should be desperate and diabolic, but this just flails about. There is a rough-hewn passion not found elsewhere in Inbal's work, but that's not saying a great deal.

The third movement's laendler country-dance gemuetlichkeit is brought out warmly here, but at the expense of the vitality that should burst the seams of the orchestral fabric. Inbal is all too tastefully autumnal, where Mahler seems to be writing about spring's flowing juices. The French horn, too, has rediscovered the wobbly tone he put aside in 4.

As might be expected, however, Inbal does rise to the Adagietto. This is probably the tenderest, most delicate version of this movement I've heard, though the climactic final bars lack the radiance and luminosity I've grown used to from other conductors. The spirituality is there in force, however. The Rondo-Finale is bright and energetic enough, but lacks that last push of exuberance—except in the final five minutes, when Inbal finally builds momentum enough to crash through to the end. A satisfying coda, but that's all.

During each of the several times I listened to this performance, my mind wandered; Inbal's reading seems distracted, his attention unfocused, the symphony undigested. Problematic and eccentric as were his readings of the first four symphonies, they at least all had unified visions; not so here. Not recommended.

However, he seems to have amended a new vigor to his classicist tendencies in his impassioned, forthright essay at the Sixth. Inbal is confident here, the strong, spare lines of this most rigorously contrapuntal of Mahler's works giving him the structural density he so loves to clarify, and the score calling for an orchestra whose huggeness, for once, he seems unafraid to deploy. I'm also happy to say that, considering the inherent limitations of the FRSO, he does as much as could be hoped for. The first movement's many abrupt shifts in tempo and dynamics are surely negotiated, and the orchestra nobly attempts to fill the hall. Rather than his usual felicities of restraint, Inbal here fully embraces Mahler's unavoidable extremes. The Scherzo's recurring devil's-accordion theme of eight shifts between the same two major and minor chords, that Fañer-like breathing on tuba and low brass, is ominously highlighted here, and to great effect (and recorded beautifully).

But the last two movements are even better: The Andante's soaring theme, at the climactic A3, gives this movement an emotional stature I've not heard before, even in Solti's hyper-Romanticism, or Horstein's thrill-a-minute hedonism. It's virtually impossible to blend the extremes of body and spirit that Mahler has written into these pages, and just as impossible to disobey his musical commands to do so. Inbal's discipline and drive resolve the double-bind in ways inspired and inspiring. It's also to his credit that, unlike 5, during which I found it hard not to woolgather, while listening to 6, particularly the Finale, I continually forgot my critical stance, so swept up was I in the dramatic momentum. This authoritative reading makes each interpretive choice seem inevitable. The first full-scale hammer-blows of fate (12:50 into the movement) fairly explode out the speakers, making me wonder if Inbal had been saving his juice ever since the "Titan" for just this orchestral splash. (Denon includes a fine-print warning, a la Telarc, about the wooden-mallet bass-drumbeat in this passage.) Even the brass seem to grow before one's very ears.
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The sound: 4's sound is, so far, the best of Denon's Mahler cycle. Recorded with only two mikes (omnidirectional, pressure-type Bruel & Kjaer 4006s), it is the first of these recordings in which the dimensions of the Alte Oper are clearly audible—there is a wonderful sense of the hall (listen, in particular, to the solo flute passages in the first movement). Congratulations all 'round.

The sound is almost as good on 5: very transparent and clear, even for a CD. The only problem is that the hall reverberations are cut off too soon, and not faded—very jarring. The liner notes for 5 state that, as in 4, two mikes were used; unlike 4, however, several "help microphones" were employed at various spots. This cryptic remark is explained in the notes for 6 (Denon should invest in a copy editor: "straïneous"? "compositoric"?), which devote an entire page of small type to an explanation of Denon's "time delay alignment mixing technique." This means that the two main mikes were, here and there, politely assisted by other spot mikes (evidently the Alte Oper's perfect "sweet spots" were never found), whose signals were then passed through a sophisticated digital delay system; this system matches the time it would have taken the instrumental sound to reach the main mikes directly from the instrument, theoretically preserving the natural ambience of the hall and garnering all the benefits of punched-in multi-miking.

This suspicious activity has been executed with the delicacy and restraint that have set the tone of the whole cycle, however, and the results are impressive. The Sixth's sound is well up to the standards of quality and consistency set by its predecessors (particularly 4), and the hall seems accurately and vitally represented. This is especially notable on the xylophone passages in the second movement, where that instrument's hard-mallet attacks, like radar, accurately limit the boundaries of the hall. Unfortunately, the last movement sounds slightly veiled, as if the entire orchestra has taken one step backward. Overall, however, this is one of the most careful, judicious applications of multi-miking I have heard.

Of this batch, then, 4 and 6 amply repay the investment of time and money; considering Mahler's Olympian demands, two out of three is not bad at all. —RL

MOZART: Songs, Vol. 1

The question here is why, with such big-name competition as Elly Ameling and Edith Mathis in the field, has Arabesque chosen to record these songs in the first place. The music is largely Mozart at his most trivial, and although seriously performed by Ms. Ringholz and Mr. Spillman, still doesn't add up to much. In fact, I suspect that if these songs could be proved to be the work of some minor 18th-century composer, the musicological world would heave a collective sigh of relief and tell us that they had always suspected as much

Given all of that, this performance is excellent. Teresa Ringholz is an intelligent soprano with a well-established voice and an obvious desire to make these songs work. She is more successful, of course, in those songs which have some musical depth, such as Das Lied der Trennung and the charming one about Luisa burning her love-letters, but she gives clear, unfussy accounts of the others. She is definitely a soprano to watch, as her talent is large enough to sing not only this recital but also some of the Victor Herbert recordings from Arabesque. Everything is done honestly, and although the voice is not particularly distinctive, the intelligence behind it certainly is. Mr. Spillman plays the fortepiano, a small-toned ancestor of the piano, and plays it well enough, although the earlier songs especially give him little of interest to do.

The sound of this recording is clear and close. This performance might actually be taking place at the far side of your living room.

It should be noted that the 17 songs on this disc amount to less than half of the Mozart songs, and that the rest should appear in due course. —HL

ARVO PART: Tabula Rasa and Arbors
Tabula Rasa: Fratres (2 versions); Cantus in memory of Benjamin Britten; Tabula Rasa
Gidon Kremer, Taina Grindenko, violins; Keith Jarrett, piano; Alfred Schnittke, prepared piano; Staatsorchester Stuttgart. Dennis Russell Davies, conductor; Lithuanian Chamber Orchestra, Saulius Sondeckis, conductor; cellists of the Berlin PO

Arbos: Arbos; An den Wassern zu Babel; Pari Intervallo; De Profundis; Es sang for langen Jahren; Summa; Stabat Mater
Gidon Kremer, violin; Christopher Bowers-Broadbent, organ; The Hilliard Ensemble; Brass of the Staatsorchester Stuttgart; others
ECM New Series 1325 (CD). Peter Laenger, Andreas Neubronner, engs.; Manfred Eicher. prod. DDD. TT: 59:21

It's seldom that a startlingly new voice, transcending all reigning compositional schools, appears in contemporary conservative music. Even less often is such a voice given the loving performances and careful production values here reviewed. Arvo Part's is necessary music; there is not a false or extra note in the spare, painstaking writing, which has all the commitment of a lifetime devoted to profound
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prayer. Though much has been alleged of the so-called minimalist spirituality, Part's work makes that of Reich, Riley, Glass, etc., seem minimalist only in inspiration and profundity, and only superficially "spiritual" — music that values neither sound nor silence, but instead creates a negative of the latter through surfeit of the former.

Arvo Part was born in Estonia in 1935, and continued to live in the Soviet Union until 1980, when he was allowed to emigrate to Israel (his wife is Jewish). He never got there, however, first living in Vienna, then settling in West Berlin. Life in the USSR had been problematic: official recognition of Part's work ranged from ovations (1962 first prize in composition, Moscow, for the oratorio The Face of the World, and Our Garden for children's choir and orchestra) to outright bans (Credo for piano, choir, and orchestra) for overtly Christian texts. However, Part came not from an especially religious background, but adheres to his "subjective religiosity" (as Wolfgang Sandner's liner notes put it) more out of basic predilection. This undogmatic but—as witnessed by his music—profoundly felt devotion to the ultimate mysteries informs Part's musical language in ways similarly undogmatic.

The way has been difficult: he has gone through several distinct compositional stages, each separated by years of total silence. He first found work as a composer of film scores (more than 50), then entered a short period of serial composition, followed by a longer, more fruitful period of "collage" works. Then followed another long period of (self-imposed) silence, during which he studied French and Franco-Flemish choral music from the 14th to 16th centuries—the works of Machaut and Josquin, among others. It is these studies that most inform the works on Arbos and, to a somewhat lesser degree, Tabula Rasa, resulting in a music that is not so much tonal or atonal, as those terms are generally understood, but pre-tonal, in the modal styles of early, or pre-renaissance, music.

Arbos, the newer release, is a collection of seven pieces written variously for 11-piece brass and percussion ensemble, solo organ, and solo and ensemble voices with and without accompaniment (violin, viola, cello, organ, percussion). The title piece, a brief (2:25), thickly textured canon for brass and percussion and the least interesting of the lot, is inexplicably recorded twice on the CD, in the initial and penultimate positions. In attempting to "create the image of a tree or family tree," Part writes, for trumpets and three weights of trombone, a layered canon in which the deeper the line, the slower the tempo. The description reads like an exercise, and "Arbos" sounds it.

From here on, however, the delights are endless. "An den Wassern zu Babel" (By the waters of Babylon), for the Hilliard Ensemble's four voices and Bowers-Broadbent's organ, is a mounting, arching vocalise that implies rather than states the words of the familiar lament. Lynne Dawson's soprano rises and falls with purity and grace, blending seamlessly with David James's countertenor, and the tenor and baritone of John Potter and Paul Hillier. Interestingly, someone (Part? the Hilliard? Eicher?) has decided that all the vocal works on this disc be sung with vibrato; strange in works that harken back so much to pre-vibrato composition and performing styles. I think I would have preferred the straight voice of Machaut or Josquin, but the vibrato does give just enough human warmth to an already austere presentation.

The organ solo, "Pari Intervallo," similar to some of Keith Jarrett's quieter organ improvisations on his Hymns/Spheres, holds virtually static airs above a shifting ground-bass: a study in the carefully chosen note. In "De Profundis," David Bevan sings some of the lowest notes I've ever heard written for a bass, joined by the male members of the Hilliard Ensemble in this long, dark, majestic climb out of the depths of Psalm 130. The music is inevitable in its simplicity, rising from the tonic in whole and half-steps with oceanic momentum, then slowly revolving and evolving, cloudlike, in benign foreboding. Midway through, as if by accident, Part slips into a bona-fide major key for a few bars (the only major passage in either recording). That this should happen in this blackest of settings indicates the depth—if not the subject—of Part's faith. As with the pieces that follow, the voices blend so smoothly and powerfully in the ambience of Ludwigsburg's Karlschohe that it's hard to believe only four are singing. This degree of purity and clarity in male voices is almost never heard except in ecclesiastical settings.

It is a testament to the timeless and universality of Part's art that the vocal line of "Es sang vor langen Jahren," a setting of the Clemens Brentano poem, is so reminiscent of the final "Abschied" movement of Mahler's Das Lied von der Erde without in any way departing from Part's neo-medieval style. This, the only truly secular song included, is achingly sung by alto Susan Bickley, accompanied by Gidon Kremer on violin and Vladimir Mendelssohn on viola. There is great sophistication here, and poignancy, achieved through use of the simplest of tools with seeming
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heartlessness. It is difficult to imagine a more fully realized performance of this lovely, lonely song. (Unfortunately, the notes, detailed in arcania of both music and recording, do not include translations—or even transcripts—of the texts.)

"Summa," for unaccompanied S.C.T.T.B., sets the Credo in a repeating quartet of lines that converge and diverge so freshly that I didn’t want it to end. The piece seems to recreate the birth of polyphony over a thousand years ago, tones and lines coming together and drifting apart, harmonies and contrasts happening as if by grace alone. This makes the technique sound newly invented: no small feat.

But the piece de resistance is yet to come: Stabat Mater, commissioned by the Alban Berg Foundation in 1985, is scored for three each of voices (S.C.T.T.) and strings (violin, viola, cello), and was recorded, like "Es sang vor langen Jahren," in St. John’s Church, London. The Stabat continues the almost unbearable melancholy of the Brentano setting, but at greater length (23:53) and with twice the forces. The flawless, breathing-as-one ensemble work is helped by the remarkable acoustic of St. John’s; the place sounds like a joy to sing in. I find this piece the most affecting of all Part’s work, embodying as it does the essences of sacrifice, commitment, dark stone, and prayer. Twice in its development, the strings burst in with desperate frenzies of baroque figureings, jarring in their volume, speed, and anachrony—the last flashes of worldly desire before apotheosis. Then, once more, the arches of vocal sound—one can hardly call them “melodies,” so reminiscent are they of plainchant—reestablish the meditative pace, and the strings close the work with ppppp unisons separated by long silences. Much of the music is a cappella, with soprano Lynne Dawson and counter tenor David James in fine voice. (The soprano part, in particular, is written for a range surprisingly wide for this sort of music.) The closing vocal unisons almost defy separation—this is ensemble singing raised to the level of sacrament. My only reservation is in the scoring: I would have preferred, I think, rebecs and viola da gamba to the modern strings presented here. All in all, however, this is very important music.

Tabula Rasa, which inaugurated ECM’s New Series three years ago, is an assemblage of four instrumental pieces composed along somewhat more conventional lines. "Frates," originally scored for "three voices above a pedal point for seven early or modern instruments and percussion," is offered here in two more versions. The first, arranged for violin and piano and performed by Gidon Kremer and Keith Jarrett, is a quiet, thoughtful piece constructed in a single long arc of crescendo/decrescendo, punctuated periodically by pairs of pizzicato chords and piano bass notes. The mood is similar to one of Jarrett’s own, more introspective piano improvisations (as in Staircase), with violin obbligato paralleling the spare, careful chording.

The second version is played here by the 12 cellists of the Berlin Philharmonic, and is altogether more powerful. The punctuation is replaced by an open fifth pedal point (which runs through the entire 11:49 piece) and hollow handclaps on a cello’s back. The violin arpeggios that softly opened, then grew into raging, full-bowed double stops halfway through the first version, are eliminated entirely in this much more elemental edition. While the first sounded like chamber music, this is strongly reminiscent of an Eastern Orthodox hymn married to Barber’s “Adagio for Strings.” Haunting. The dynamic range must be heard to be believed.

The “Cantus in Memory of Benjamin Britten,” almost identical in structure to the later "Arbos," is a canon for orchestra in which the voices move more slowly as their range descends. The piece ends in a long, static, minor chord that lasts for a full fifth of its five-minute length, and is similar in its dead-seriousness of intent to much of Carl Ruggles’s work (particularly Sun-Treader).

The first section of "Tabula Rasa," for two violins, prepared piano, and strings, shares with the violin/piano "Frates" a long line punctuated by percussion—in this case, a prepared piano sounding much like a steel drum. Part uses a great many more notes here than usual, and in an aggressive, Vivaldi-esque concerto grosso style. The recording is disconcertingly revealing: the phenomenon JA mentioned in a recent issue—of hearing great distinction between the sound of horsehair on gut and the sound of the actual musical tone—is quite audible. The entire 26:26 piece is a single ascent from and descent to the tonic, which it never quite reaches, ending a whole step above. (Fast-forwarding the piece on my CD player in less than a minute gave me a useful aural schematic.) The Lithuanian Chamber Orchestra plays beautifully under Saulus Sondeckis.

Re. the recording in general: “It is enough when a single note is beautifully played.” No other of Part’s statements so sums up his work as this. Nor could ECM’s founder and producer, Manfred Eicher, find a more succinct statement of his own recording ethos. Eicher has become notorious in jazz and audio circles for his chamber-music-like recording style of
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intimate milking in electronic approximations of very reverberant halls. For this recording of sacred music in actual sanctuaries, however, the reverb is built in. There is an astonishing "wetness" to the vocals throughout Arbos, resulting in seamlessly smooth textures. Also, the extreme dynamic range of the performances imparts a wonderful fragility to the sound, emphasizing all the more the specialness—not preciousness—of the event. *Tabula Rasa*, recorded under quite a variety of circumstances, is not as consistent; quite audible tape hiss mars the many silences of the 12-cell version of "Fratres," and the live recording (a 1977 Cologne radio broadcast) of the title piece is *very* live, with lots of page rustling, chair squeaking, coughs, door closings, footsteps up the aisles, and that inevitable hiss. This last piece is also the only harsh recording on either disc. Even so, the dynamic range of the 12-cell "Fratres" is overwhelming, AAD and all, and reminds me of my early, gain-riding digital days: turning up the volume for the soft passages, down for the loud.

Respects to Eicher for recording Part's music, and for lavishing such detailed effort on the presentation of such important, deserving work. My conceptions of what can be expressed by Western music have been greatly expanded; composers and performers can do no more than that. —RL

**MIKLOS ROZSA on CD**

**Ben Hur**

Rozsa, National PO and Chorus. London CD 820 190-2. TT: 47:10

**Quo Vadis**

Rozsa, National PO and Chorus. London CD 820 200-2 TT: 40:17

**Knights of The Round Table, Lydia (Suite for Piano)**

Albert Dominguez, piano; Muir Mathieson, Studio Orchestra of MGM, London.

Varese Sarabande CD VCD47269. Tony Thomas. prod. (*Lydia*). TT: 56:41

**Spellbound Concerto, New England Concerto, The World, The Flesh, and the Devil, Because of Him**

Joshua Pierce, Dorothy Jonas, pianos; Cynthia Millar, Ondes Martenot; Elmer Bernstein, Utah SO

Varese Sarabande CD VCD 47226. TT: 44:55

**The Thief of Bagdad, The Jungle Book**

Rozsa, Nuremberg SO; Klauspeter Seibel, Nuremberg SO

Varese Sarabande CD VCD47258. TT: 48:07

**Time After Time**

Rozsa, Royal PO

Southern Cross CD SCCD 1014. John Lasher and Nicholas Meyer. prods. TT: 39:02

Film music is undergoing somewhat of a renaissance these days, and the music of the great composers of Hollywood's "Golden Age" has never been so popular. The Japanese started it, I think, by introducing new pressings of long-out-of-print soundtracks to their almost fanatical home collector's market. When these Japanese reissues appeared on this side of the pond, they were eagerly bought (at scalpers' prices—"Imports, you know") by American collectors who had been trying to get the majors to rerelease this stuff for decades. It was at this point that the majors (and some of the minors), sniffing a buck, decided to climb on the bandwagon, leading to the present embarrassment of riches.

Even though almost all movie scores sell fairly well these days, most film-music buffs have a special place in their hearts for the composers of the "Classic Film Score" days of the '30s, '40s, and '50s, the "illuminati" of which include Erich Wolfgang Korngold, Max Steiner, Alfred Newman, Dimitri Tiomkin, and—the only surviving member of this august body—Miklos Rozsa.

Rozsa was born in Budapest in 1907 and, after graduating from Leipzig University, migrated to Paris to study composition with Arthur Honnegger. It was here that he composed his first international success, *Theme, Variations, and Finale*, which has been championed by such diverse conductors as Munch, Walter, Solti, and Ormandy. In 1937 Dr. Rozsa went to London, where fellow Hungarian Alexander Korda offered him an opportunity to score films. At the outbreak of World War II, Rozsa followed Korda to Hollywood to score such films as *The Thief of Bagdad, Lady Hamilton*, and *The Jungle Book*. After the War, Rozsa stayed in Hollywood to write some of the finest scores ever penned for motion pictures. He has won three Academy Awards, for *Spellbound, A Double Life*, and of course, *Ben Hur*. Dr. Rozsa has retired from film music, his last score to date being *Dead Men Don't Wear Plaid*. This Chevy Chase vehicle is a comedy spoofing the very '40s-style "Films Noir" (*The Lost Weekend, Brute Force, The Red House, The Asphalt Jungle*, etc) which earned him much of his early fame in this country.

All good cinema composers can come up with a great score when it is called for, but Rozsa seemed unable to ever turn it off. All of his scores were of one quality—the best he could do. If *Ben Hur* is great music, it should be; it was for a great film. *Time After Time* is just an inexpensive little thriller, yet Rozsa's music for it is every bit as good as the *Ben Hur* score. In fact, of all the film composers, I can think of none (except, perhaps, Bernard Herrmann) who wrote so much consistently great music for so many great and not-so-great films.

What we have in this collection are six currently available CDs containing some of Rozsa's most memorable work. Most of the sources for these discs are analog, but two are from digital masters. None of the discs discussed
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here are actual soundtrack recordings except for Time After Time (Knights of the Round Table, although recorded as such in 1953, was not used in the finished film).

The Two London Discs, Ben Hur and Quo Vadis, were originally recorded in 1977 for British Decca's "Phase Four" series and are thus from analog sources. Both were conducted by the composer, and the Quo Vadis is the only stereo recording of this music available (one might still find a used copy of the original soundtrack, but since the score was recorded to acetate disc masters, the sound is atrocious). The Ben Hur music is also available on a CBS CD from the original soundtrack recording, but the London sounds better. About the sound: both discs are heavily multimiked, so one shouldn't look for much in the way of good soundstaging. The master tapes seem to be in good shape, and there are no serious problems with the sound. The bass is good and tight, the highs characteristic of many analog-to-digital transfers: not too aggressive, and quite listenable. Neither CD is currently available on LP from London. You may run across the Decca versions at large record stores in big cities, or in shops catering to film-music buffs (such as Intrada in San Francisco).

The score for Knights of the Round Table was recorded in stereo in 1953 for MGM's first Cinemascope picture. It was part of the Cinemascope "package" in those days (the process, owned by 20th Century Fox, had to be licensed from them) that pictures released in the new format had to be both in color and have stereophonic sound. For some reason, two complete stereo soundtrack recordings were made for the picture. One was recorded in England with Muir Mathieson presiding, the other at MGM in Hollywood with Rozsa. The Hollywood recording made it to the screen, but the British session is used for this disc. The microphones used in the early '50s had a slight "metallic" quality that boosted the midrange somewhat out of proportion. The highs peak at around 10K, then roll off fairly rapidly. The bass sounds somewhat bloated by today's standards, and is tubby and ill-defined. There will be no doubt in the mind of anyone who listens that this is a vintage recording. On the plus side, stereo was new and multi-miking was not widely used; the result is a real stereo recording with very good soundstage. My only other complaint is one which generally applies to all film soundtracks recorded on Hollywood soundstages (even those recorded in England): the sound is very dry, with almost no ambience. It sounds as if recorded in a barn (as it was).

The music for Knights of the Round Table is typical of Rozsa's "epic style," which he began to evolve with Quo Vadis several years before, and continued with Ivanhoe in 1951. Knights is stylistically akin to both of these earlier epics, and thematically very similar to Ivanhoe, the latter being a somewhat better score from a musical standpoint. Knights is nonetheless quintessential Rozsa, and very representative of the composer's ideas during this phase of his career. As filler, Varese Sarabande has included a Piano Suite from the film Lydia, written by Rozsa in 1941 for Alexander Korda. The recording presented here is played by Albert Dominguez, and seems to be a digital recording. The liner notes are somewhat sketchy, but it seems that Dr. Rozsa supervised this nicely recorded suite.

The Spellbound Concerto, surely one of Rozsa's most enduring and popular works, is based on the haunting themes and attractive melodies written for the 1945 Hitchcock film Spellbound. The piece has long been regular concert fare both in the United States and Europe; Leonard Pennario's Hollywood Bowl SO recording, made for Capitol in the late '50s, is likely played on some classical FM station somewhere in the US every day. The score, unusually for its time, made use of a strange electronic instrument called a theremin, whose eerie sounds perfectly complemented the film's psychotic overtones. It should be noted here that Rozsa originally scored Spellbound for an even stranger French electronic instrument called the Ondes Martenot. The problem was, the only person who had one of the things was its inventor, Maurice Martenot, who was in France. Because the European Theatre of WWII was still winding down when Spellbound was scored, Martenot and his instrument could not be obtained; Rozsa substituted the theremin, a widely used American "gimmick" instrument easily constructed by anyone with a little electronics knowhow (I built one myself, when a teenager). The results were dramatic: the music, an instant success, fit the mood of the film perfectly, and won Dr. Rozsa his first Oscar.

For this recording, longtime Rozsa admirer and friend Elmer Bernstein (The Ten Commandments, The Magnificent Seven, True Grit, etc.) obtained an Ondes Martenot. This new two-piano arrangement of the famous concerto, although it will be familiar fare to anyone who knows the Pennario recording, is nonetheless different enough to warrant consideration. The New England Concerto is a much less interesting work made up of themes from both Lydia and Time Out of Mind.
New releases available on Pure Analogue 33⅓ rpm LP and Digital Master compact disc. Recorded by Prof. Johnson, naturally.

Jaap Schroeder and Stanley Ritchie with Albert Fuller and the Helicon Ensemble of New York in first recordings of Vivaldi works featuring two solo violins, the Bach Double Concerto and more (RR-23).

Choral music for the holiday season, with pipe organ, harp, flute and bell-ringers. Traditional carols, renaissance motets and dramatic 20th-century compositions, in expansive cathedral acoustics (RR-21).
The sound is typical contemporary multimiked digital. The detail is all there, but everything is a bit too close-up and clinical. The playing, and the new Spellbound recording, however, make it worthwhile.

The scores for Thief of Bagdad and Jungle Book were among Dr. Rozsa's earliest Hollywood works. Done for Alexander Korda during the early days of WWII, these two beloved scores are recreated here in relatively new recordings. Both were recorded in Germany in the late '70s, with Rozsa conducting Thief and Klauspeter Seibol conducting Jungle Book. It is interesting to note here that the Jungle Book recording is the only one ever done without narration. For the first time it is possible to concentrate on this wonderful, imaginative score. The Thief of Bagdad, probably familiar to everyone, is a brilliant effort bubbling with fun and fantasy. I even like "I Want To Be A Sailor" (which I hated in the film), with the surepy Sabu singing. The recording is good German analog and is transferred well to CD. Again, Varese Saraband is to be applauded for making this music available, but their sound, while competent, has rarely been anything to write home about. The string tone is good, as is the bass, and the highs won't make your ears bleed. Since the recording is multi-miked, there is no soundstage to speak of.

Time After Time is one of Rozsa's later efforts. The 1979 film, in which Malcolm MacDowell, as an owlish HG Wells, chases Jack the Ripper into the present in a time machine, is a delightful romp written and directed by the brilliant Nicholas Meyer (The Seven Percent Solution, Star Trek II). For this film Rozsa has written one of his best scores, filled with whistleable tunes and even a good piano waltz. The recording is typical of soundtracks: somewhat dry and over-miked. The sound, while not first-rate, is much better than most soundtrack recordings, and quite listenable. If you're tempted to buy any of these Rozsa scores, start with this one! —GG

TELEMANN: Wind Concertos
For Transverse Flute in D major; For 3 Oboes in B flat major; For 2 Chalumeaux in D minor; For Trumpet in D major; For Recorder and Transverse Flute in E minor; For Trumpet and Violin in D minor
Wilbert Hazelzet, transverse flute; Peter Westermann, Michael Niesemann, Piet Dhoont, oboes; Erik Hoeprich, Lisa Klewinski, chalumeaux; Friedemann Immer, trumpet; Michael Schneider, recorder; Reinhard Goebel, violin and director of Musica Antiqua, Cologne (original instruments)

First of all, the Concerto for Two Chalumeaux in D minor. Don't know what a chalumeau is? I seem to recall its meaning "blowtorch" in French Concerto for Two Blowtorches in D minor, the kind of thing Professor Peter Schickele might have played after the Concerto for Horn and Hardart. But no, a chalumeau is an early clarinet, a single-reed instrument which, to me, sounds much like a bass clarinet. I was reminded of Giora Feldman and The Magic of the Klezmer on a Delos CD. Could there be a connection between Telemann and East European Jewish folk music? Indeed, there could, for there is very much a folksy element in the North German composer's music.

This is not just another release in the procession of war horses from Telarc. These are great performances, and gracious ones—light, agile, swiftly moving, just what these ballet suites call for. The recording, too, is practically perfect, in contravention of Holt's law: the better the performance, the worse the recording, and vice versa. Not so here. The recording is warm, atmospheric, detailed. The skiing is just right: neither up too close or back too far. But it's the performances that interest me most. Listen to the way Mackerras and the RPO handle the beginning scene of Act II (No. 10) of Swan Lake—almost understated, certainly not overwrought. Especially lovely is the violin solo by Barry Griffiths in the third section of "Dance of the Swans," joined by Francois Rive, cello; these moments alone are worth the price of the disc.

The performances are, as I said, fleet-footed—balletic rather than symphonic, light instead of heavy. I could almost close my eyes and see the dancers. Not that there's anything lightweight about the conducting or the playing. Listen to the stormy opening of the Sleeping Beauty suite. The sound is lean, muscular, and powerful, and could only be accomplished by superb ensemble playing. So bravo to the RPO, and to Jack Renner and the Telarc forces for capturing this performance to (dare one say it?) perfection. But most of the praise should go to Mackerras. Remarkably (for such overplayed music), he approaches the scores fresh. One is reminded of Yevgeny Mravinsky and the way he can practically tear Tchaikovsky apart, only to show the most poignant tenderness scant seconds and a few bars later. (If it weren't for the orchestra, one might take the conductor for a Russian, so native is Mackerras's way with the music.) These are two of the finest Tchaikovsky performances on disc. —TG
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This is interesting stuff, not your typical write-it-by-the-yard Vivaldi, where form constrains content—it is not rococo elevator music. And Telemann was particularly inspired when writing for winds—here, in addition to the blowtorches (er...early clarinets), the transverse flute, oboe, recorder, and trumpet. Original instruments, natch—this is the Musica Antiqua of Cologne—but not stodgy, sterile academic performances. You may put this disc on as background music, but it quickly takes over the foreground. I won't say it's deep, but it's delightful: magnificently played and superbly recorded, with enough depth and ambience, and crystal clear. And on DG Archiv...very encouraging! There is not a great deal of Telemann on CD, all the more reason to add this nifty recording to your collection.

—TG

**CLASSICAL COLLECTIONS**

**EDITION LOCKENHAUS/GIDON KREMER**

(Selected performances from the Lockenhaus Chamber Music Festivals, 1981, '82, '84, and '85; various compositions and artists)


Roland Pulzer, Martin Frobeneus, engs.; Manfred Eicher, prod.

Gidon Kremer has selected works covering a musical time period from the last moments of the Classical era to the middle of the Twentieth Century. Volume I consists of pieces by French composers Franck, Caplet, and Poulenc; Volume II includes works by Janacek, Stravinsky, and Shostakovich; and the whole of Volume III is Schubert's Piano Sonata in B minor, D. 960. Despite the wide range of composers, the unifying theme seems to be that of the earlier works tend to look forward stylistically, while the later works are seasoned with many elements of preceding musical eras. Another factor shared by these selections is that, other than the Schubert, none of the works has been recorded to any great extent. This, coupled with first-rate performances throughout, makes *Edition Lockenhaus* a very refreshing and desirable musical offering.

Cesar Franck's Quintet in F minor for Piano and Strings is highly emotional and romantic in character, this highlighted by many moments where the harmonic tensions suggest Impressionistic dissonances resolved within the fabric of the composition. Although undated, it is likely a later work, displaying a mature mastery of developmental techniques. The performers—Alexandre Rabinovich, piano; Lukas Hagen and Krista Bennion, violin; Tabea Zimmermann, viola; and Clemens Hagen, cello—provide a flawless interpretation of this rather complex three-movement quintet, which features beautiful solo piano passages, strong, economical string writing, and patient dynamic balance and structural momentum.

**Conte fantastique d'apres une des histoires extraordinaires d'Edgar Allan Poe: "Le Masque de la Mort Rouge,"** byAndre Caplet, is an Impressionistic work for harp and string quartet. This is one of only two pieces by the composer listed in the Schwann Catalog, and underlines one of the important goals of the Lockenhaus Chamber Music Festival: to bring to light important, relatively unknown works by deserving composers. It is this intent, which has sometimes brought criticism of the festival, that I find most laudable—a format that instructs as well as delights. The performance is excellent. The work contrasts the subtle difference in timbre between the harp and the strings through the use of a haunting, recurring harp arpeggio.

Vol. I is completed with Poulenc's *Deux melodies extraits de "Fiancailles pour rire."* Christine Wittlesley, soprano, and Robert Levin, piano, provide a sensitive and definitive performance of these two excerpts. Of particular note is Mr. Levin's *pianissimo* opening accompaniment to the first song. It is hard to imagine the piano being played more quietly or beautifully.

Vol. II consists of works by Slavic composers. Leos Janacek's String Quartet No.1 is a pivotal work in defining the transition from the Romantic era to the Modern. The second movement is in Rondo form, with the main theme an unforgettable charming Gypsy melody so eloquent that the listener longs for its return throughout the subsequent two movements. Rather than repeat this phrase, however, Janacek creates a similar longing through the entry in the third movement of virtuoso high-register overlapping whole-tone scales, again interspersed in Rondo form. The fourth movement is quiet and reflective, a departure from the more common practice of an up-tempo, climactic finale. The Hagen String Quartet provides a chilling performance guaranteed to linger with the listener. This selection alone is worth the price of admission.

**Tango-Valse-Ragtime de L'histoire du soldat,** by Igor Stravinsky, looks back into the musical past, delivering a scathing musical satire that contains some of the most comical moments in all of instrumental music. This is a particularly inspired version, containing more excitement than I have heard in any other recording of this excerpt. *Concerto en Re,* also by Stravinsky, is perhaps a little lost in this edition, as it is a thoughtful rather than
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passionate work that is not among Stravinsky’s best; however, average Stravinsky is still very good indeed. In reviewing the CD version of Vols.I and II, this piece did not stand out; but in listening to the LP, I found that the greater tonal clarity of the strings greatly enhanced my appreciation of it.

Shostakovich’s “Two Waltzes” for flute, clarinet, and piano is a work that could easily have been composed 100 years earlier. The waltzes are of such charm and beauty that I will only say listen to them! The last offering in Vol.II, Shostakovich’s “Two Pieces for String Octet,” is a thoroughly modern work that is still suggestive of earlier musical styles in the way it accompanies the various thematic ideas, utilizing eighth-note tonal clusters to define the rhythm in a similar fashion to the Stravinsky Concerto en Re. The second piece employs Bartókian scales, which the ensemble executes with perfect dynamic intensity.

In reviewing Vols.I and II in CD and LP formats, I found the latter to be far superior to the silver disc. Although the CD is excellent for AAD, it lacks many nuances that the record provides. The LP clearly conveys the wooden timbre of the string instruments, something only suggested in the CD. In addition, the breathing of the musicians sounds far more like actual breathing on vinyl. Finally, I found the CD to have an inferior stereo image, with most of the information coming from the left. This was occasionally very intrusive, one instance being the emergence of the high treble of the piano in the right channel, creating the impression of an elongated instrument with its back to the audience.

Unfortunately, I was unable to attain an LP of Vol.III. Here, the sonic quality of the CD is unacceptable; however, Valery Afanassiev’s interpretation of Schubert’s Sonata in B minor is extraordinary. Pending a future review of the LP, I must recommend avoiding the CD, as this brilliant, well-crafted performance sounds as if it took place under water.

Gidon Kremer deserves a standing ovation for his dedicated work in creating Edition Lockenhaus. In the LP format, Vols.I and II are highly recommended. —JB

MUSIC FOR A VIOL
Siegiswald and Wieland Kuijken, violas da gamba; Robert Kohnen, harpsichord
Accent ACC 88014 (CD). ADD (?)

... and from henceforth, the stateful instrument Gambo Violl, shall with ease yeeld with various and as devicefull Musick e the Lute. For here I protest the Trinitie of Musick; parts, Passion and Division, to be as grace-fully united in the Gambo Violl, as in the most received Instrument that is.

So wrote Captain Tobias Hume, the impoverished English soldier and composer, in his First Part of Ayres (1605). Anyone spending an hour with this collection of seventeenth-century pieces for the viola da gamba, carefully selected and beautifully performed by Sigiswald and Wieland Kuijken (with Robert Kohnen, harpsichord) cannot choose but to agree.

The Kuijkens are among the busiest and finest violists performing in the Baroque and Pre-Baroque repertoire. Their work with La Petite Bande in particular has received a good deal of well-deserved critical acclaim: perhaps only Jordi Savall and his ensemble Hesperion XX are more active and better known. Here they perform a diverse and interesting set of pieces by the English composers Christopher Simpson, John Jenkins (who was one of Purcell’s inspirations), Matthew Locke, and Thomas Ford. These fantasies, divisions, and dance arrangements are precisely the sort of quiet “lost” music JGH referred to in Vol.10 No.2. For my part, I find this music difficult to forget—certainly I cannot treat it as “audible wallpaper.”

Although most of these compositions were written for the bass viol (a violin joins on two tracks, and there is harpsichord continuo on a few others), there is plenty of variety for the ear in following the musical lines in and out of the harmony—a process strongly abetted by the quality of the recording—and the raspy growl of the bass is a pleasant sound indeed. A number of the works on this CD were written for lyra viol, a technique in which the violist plays through chords, making fingering difficult. It is usual to employ a somewhat smaller instrument in this sort of music (sometimes, confusingly, called a “lyra viol”), but the Kuijkens appear to eschew this practice, a feat which is technically difficult but tonally rewarding.

The bass viol is not often heard in a featured role; it is good to have it as well recorded as on this Accent CD. Not only is the tonal character of the (presumably gut-strunged) viols accurately preserved, but the soundstaging and imaging are also well realized on my Polk SDA-SRS 2s (pace Martin Colloms—the smaller ones sound much better). It is not only possible to locate the instruments on the realistic-sized stage, but it is also easy to hear the spatial difference between (say) the fingers rapping on the fretboard, and the bow on the strings.

Then there’s the harpsichord. This is an instrument with which I am very familiar, having friends who have built them, and having even
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Stereophile, November 1987
picked out a few melodies with my clumsy fingers on the keyboard (when not listening to more expert hands). It is easy to record a harpsichord badly. Its complex tone and timbre are often reduced to a sort of diffuse, distant "ching-ching"; not so here. On this CD, the contrast between the attack and decay of the plucked strings is exactly rendered, along with the distinctive sound of the "wires in a box." The result is nothing less than exquisite.

In sum, an interesting and rewarding exploration of the first solo writing for the gamba, expressively performed and splendidly recorded. My highest recommendation. —LB

MUSIC TO ENTERTAIN THE KINGS OF HUNGARY
Camerata Hungarica, Ars Renata, Caidra. Hungaroton HCD 12896-2 (CD); Judit Lukacs eng.; Zoltan Heeser prod. AAD. TT: 68:14

There is a bit of harmless chicanery in the title of this disc: only one of the half dozen or so composers represented can be shown to ever have been in Hungary—much less provided music to entertain the kings. Nevertheless, it is a nicely balanced concert of Renaissance music authentically performed by a chamber group and a small chorus. The works are standard Renaissance fare, with the selections by Willaert being the most interesting, as indeed they were in their own day. Among the other composers are Finck, Hofthaimer, Grefinger, and Stoltzer. The performers enjoy their work, and the recorded sound (from 1979) is clear and direct. A particular joy is the sound of four very nasal crumhorns. —HL

RUSSIAN TONE POEMS
Vladimir Fedoseyev, USSR Radio and Television Large Symphony Orchestra

Another Night on Bald Mountain! Just what the world needs, you might say, as you skip this review. Well, don't skip it. First, this is a fine performance of Bald Mountain, if not the most sumptuously recorded (the recording is a little thin, forward, and brash in the Russian manner). Ditto for the Borodin pieces. Fedoseyev is one of the Soviet Union's most highly regarded conductors, and he turns in satisfyingly Slavic performances. If there is a theme to this collection, it is Russia's fascination with Central Asia: exotic, Oriental, the area from which arose the Golden Horde. And if there is one work to treasure on the disc it is Ippolitov-Ivanov's Caucasian Sketches—how fortunate we are to have it on CD! The work is rooted in Caucasian folk music, and the influence is real, not faked: the composer lived for a while in the Caucasus. I particularly love the second movement, "In the Village," with its dialog between a solo English horn and muted solo viola—broken off in the middle by a village dance, complete with tambourine. This time, Mobile Fidelity gives us liner notes in English, no Russian. Pachimut'? Well, sometimes Melodiya gives us Russian, no English. At least there's no time gyp here, as with certain other Mobile Fidelity/Melodiya releases. Not quite the best sound, but the performances are first-rate and the Caucasian Sketches simply must be heard. —TG

THE RUSSIAN VIOLA

Some progression—from the schmaltzy romance of Rubinstein, Glinka, and Glazunov to the dissonance of Stravinsky to the last completed work (and one of the greatest) of Dmitri Shostakovich. But the progression does make some sense, chronological and otherwise. The Rubinstein, Glinka, and Glazunov are minor pieces, but nonetheless beautiful...and quite accessible. Nobuko Imai's viola is as warm and creamy-textured as one could ask for. But by the end of the Glazunov I was becoming hungry for music of more substance—like the Stravinsky Elegy, which I find fascinating (a two-part fugue in the second part) but not particularly appealing. However, it does serve as a transition to the Shostakovich Sonata for Viola and Piano, which is the longest and the only major work on this disc. What an astonishing work! The first movement opens with an echo of Alban Berg's violin concerto. Throughout the work, there are echoes of Mahler (the Seventh Symphony), Tchaikovsky, Shostakovich himself (the liner notes said the Shostakovich Symphony 5, but I kept hearing 10). It is the final movement adagio after Beethoven's "Moonlight Sonata" that is most riveting, however: the most tortured emotions followed by—what—resignation? No, not quite: some form of ineffable affirmation. The playing is just wonderful—both Nobuko Imai's and Roland Pontinen's—and the recording is just what we expect from Bis: practically perfect in every way. Skip the Rubinstein and the Glinka if you find these works too sappy and insubstantial, but buy the disc for the Shostakovich. And be sure to play it late at night, before you go to bed. There is no listening to anything else after this emotional experience. Three days after he finished the adagio, Shostakovich died suddenly of a heart attack. —TG

Stereophile, November 1987 173
In the Idiom, Randy Brecker's first mainstream jazz session as a leader, is an auspicious debut. Structured as a loose chronology of the evolution of mainstream jazz from the early '50s to the late (pre-Silent Way) '60s, the album lives up to its title, using to wonderful effect some of the strongest players of that period. Randy, better known as the other half of the Brecker Brothers' own fusion bands and endless session work, here sets himself a stiff challenge in testing his playing against such formidable giants as Henderson, Carter, and Foster. It is to his credit that the result is so beautifully balanced.

With all such trumpet/sax families (the Breckers, the Marsalis, the Adderleys), comparisons are inevitable. Saxist Mike Brecker, better known as a soloist, has the better chops and solos harder, with a bright, hard tone. By his own admission, however, Randy has "always been a little too concerned with chops and speed. Some part of that has to do with playing with my brother for so long. That's bis forte. I'm at my best when I play less notes, more melodies."

As a soloist, Brecker has many of the same instincts as Freddie Hubbard, but without the pyrotechnics. There's also more than a hint of Kenny Wheeler's poignancy on the slower tunes, and plenty of Lee Morgan's slow burn. For the most part, Brecker keeps to medium tempi.

Joe Henderson has never received the fame his playing deserves; well in his fifties now, however, he has been making some important recordings lately (see his two Art of the Tenor releases). He's in rare form here, particularly on "Hit or Miss": brave, masterful playing. Ron Carter continues to amaze, pulling those endless small surprises out of the rhythm that have made him the bass-player's bass player for so long ("Hit or Miss," "Little Miss P"). Al Foster, sounding considerably more relaxed here than in the recent wall-of-rhythm Miles Davis bands, plays richly and delicately, with solid support. Pianist David Kikoski, a new name to me (he's been playing with Roy Haynes), is the only player not consistently up the standard of the rest (although his soloing on "There's a Mingus a Monk Us" is impressive).

The compositions, all Brecker originals, are consistently interesting and appealing, clearly more so than anything Wynton Marsalis has written lately. "Hit or Miss" and "Mingus," with quick tempo and key changes, are particularly meaty listening, and "Little Miss P" bears more than a passing resemblance to Marsalis's "Twilight."

All in all, this solid, muscular playing brings back memories of the best of the Bluenote sessions of the early and mid-'60s. Highly recommended.

—RL
In addition, the man's an idealist: he actually believes that there is an arena of public discourse out there somewhere, a forum in which issues of music, morality, and political and cultural transformation are discussed in a rational and serious manner. That there is not is hardly his fault. That he continues to beat his head against the wall of the contemporary mass media makes him equal parts visionary and fool. I admire his integrity, and share his conviction that such things must be said, such music written. But, Christ, these kids can't even read. Meanwhile, Zappa gives over 100 interviews a year . . .

The relations among Zappa, his own custom labels (Bizarre/ Straight, DiscReet, Zappa, Barking Pumpkin), and their distributors (MGM, WEA, PolyGram, CBS, EMI, Rykodisc) have been even more strained. For a year or so, in fact, the only Zappa releases officially available were the first four EMI's—this out of an oeuvre of some 40 releases comprising more than 50 discs. This vacuum, however, was Zappa's own choice. After clearing the deck with court battles that lasted for years, Zappa has retained ownership and control of all of his masters, has remastered his entire back catalog in his own digital studio (one of the first in the world privately owned), and, with archival comprehension, is now re-releasing most of that work on the CD-only Rykodisc label. EMI still distributes new vinyl releases on Barking Pumpkin, and *The Perfect Stranger*, with Boulez, on Angel.

All of this adds up to a treasure-trove for hard-core Zappists like myself, whose ancient (and often none too good in the first place) pressings are wearing through. There have been some pleasant surprises on some of these reissues, and Rykodisc promises much more. A chronological overview of releases to date follows.

**We’re Only In It For The Money:** If there is single classic Zappa/Mothers album, *Money* is it. Released only months after *Sgt. Pepper*, to which it directly replies and which is painstakingly parodied in the cover art, this remains Zappa's most biting, well-aimed, and kaleidoscopic assemblage of humor, music, musiquette concrete, electronics, and remarkable editing. No more dated than *Pepper* itself, and some of it less so, parts of it are still disturbing. Unfortunately, the four-track master tapes were poorly preserved by MGM, and the oxide on the bass and drum masters had almost entirely flaked off; Zappa decided to re-record the tracks. In this case, however, Zappa the musician overruled Zappa the archivist, and the original mono drum kit and tight, dry, R&B bass were replaced by a multimiked kit and loopy, Marcus Miller-style bass. The effect is startling and, I think, wrongheaded. Having heard *Money* a hundred times, I found it wrenching to hear layer after layer of intimately known music supported by a rhythm section anachronistic in both timbre and style. Sort of like opening a closet door in the house you’ve lived in for years, only to discover a yawning, echoing cellar you never knew existed. Trouble is, somebody forgot to put in the stairs. I would have preferred re-recordings more faithful to the originals. Word is that FZ has used the same technique on '68's *Cruising With Ruben and the Jets*, due out this fall.

A marvel of editing for its—or any—time, *Money*, in its new format, is not as lock-step dead-on as the original. Granted, recutting all those hundreds of edits must not have been a picnic; but there are spaces where none were before, split-second gaps and pauses that add up to a somewhat diffuse, loose, and lopsided feel for the whole piece. On the bright side of archivism, the lost verse of “Other People,” previously censored on the MGM LP and recorded backwards on the inner groove of side 1, is here reinstated in all its scatological glory. Also, some more paranoid whisperings by Dick Kunc, somehow lost on the cutting-room floor the first time around, are reinserted. And the sound takes full advantage of the digital medium, especially with Don Preston's prepared-tape extravaganzas. On balance, a careful, responsible reissue, though not impeccable. I'm happy enough just to have this masterpiece back on the shelves.

**Lumpy Gravy:** Re-released on the same CD as *Money*, *Lumpy Gravy* is a musical paraphrase of *Money*’s more didactic socio-political commentary. Spliced together from orchestral, rock, and jazz sessions (including Shelly Manne), monologues by crazed auto mechanics, and extended colloquy by various freaks inside a drum, or piano, or both (out-takes from this last surfaced 20 years later on the US version of *MOTHERS OF PREVENTION*—see below), Gravy long held the position of Zappa's most obscure, abstruse composition, a legendary status amplified by its only intermittent availability. The original LP was remarkably well mastered for its time ('68); the CD improves things somewhat, but not remarkably. Zappa has stated elsewhere that “newly overdubbed material” was used on this remastering, but I have yet to hear where.

When even well-worn copies of these two albums go for $40-$60 apiece in used-record shops, they’re quite a bargain on a single CD. *The Grand Wazoo*: Between the original Mothers and the Flo & Eddie edition, Zappa assembled a 21-piece big band for a series of

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sessions that resulted in Wazoo, Waka Javaka, and some as-yet unreleased material. The style was new for FZ, and was matched by new thresholds in recording and disc mastering, the latter being about as good as early-'70s WEA discs got. Alias's bass, Bill Byers's trombone, and, again, Don Preston's mini-Moog particularly benefit from the CD version, which is, if anything, warmer and fatter-sounding than the already rich LP. At a total time of 3:70, however, I would certainly have appreciated some of those previously unreleased tracks I keep hearing about. (For that matter, the entirety of the Baby Snakes soundtrack could have been appended.)

**Overnite Sensation:** This has proven one of Zappa's most popular releases, for reasons the ironies of which are certainly not lost on him. Musically one of the least interesting, Sensation sports a very slick band including George Duke, the Fowler brothers, Ruth Underwood, and Jean Luc Ponty. The songs are, shall we say, accessible, the lyrics—about dental floss, kinky puddles, and the vacuity of TV—trivial. By this time ('73), however, Zappa's impeccable production values were in full swing, and the band, which sounds like the studio band of the gods, is wonderfully recorded.

Compression was always a particular problem in recording Zappa's rococo, ornamentalist approach to composition and arranging, and his audiophile approach to sound: he attempted to pack so much in the grooves (sections of '68's Uncle Meat have as many as 40 tracks laid in) that much was lost, even with the best of mastering. The CD transfer takes nothing away here, but reveals much in terms of instrumental lines I'd never even heard before, let alone heard well. The mix just seems to go on forever, layer after layer of arabesque and detail, particularly in "Camarillo Brillo" (the fakeout horns) and "Dinah-Moe-Hum" (background vocals and foreground mutterings).

**Apostrophe:** On the same CD, from the following year, this collection of studio takes with pick-up bands is considerably more interesting. The horn arrangements on the opening suite of narrations, breaks, and ensembles (from which the "Yellow Snow" single was excerpted) are fast, furious, and complex, well served by the silver disc, while "Stinkfoot" contains one of the more palatable instances of feeding a guitar directly into the board. The CD is particularly gracious to the title cut, an instrumental power trio featuring Jack Bruce on bass. Even the generous spread of vinyl allotted on the initial LP release proved incapable of preventing breakup on this very loud jam; for the first time, I'm hearing only the distortion of Zappa's and Bruce's amps, and not my cartridge.

**Shut Up 'N Play yer Guitar:** Any frequenter of Zappa concerts knows that his best solo and group improvisations seldom make it to even his live releases. Well, here they are in spades, including the quieter, more reflective studies Zappa seldom seems to have the nerve to release—his answer to all those guitar mavens who just want to hear him beat his axe. Of particular interest here are the guitar/drum interplay on "While You Were Out," the reggaeish "Treacherous Cretins," the Miles Davis/Jack Johnson-styled "Canarsie," and—for those who loved the wah-wah break on "Little House I Used To Live In" (Burnt Weeny Sandwich), there's 5½ minutes of it here on "Ship Ahoy." Disc 2 is even better: the heroic "Deathless Horsie," and the moony, mysterious "Pink Napkins," with Patrick O'Hearn's melting bass. The best is saved for last, however; at 10" each, the serene "Stucco Homes," for two acoustic guitars and drums, and the eerie "Canard du Jour," with FZ on bouzouki (?) and Jean-Luc Ponty on baritone violin (?), are listening time well spent.

The CD sound is particularly complimentary to these last two, recorded sometime in '71 or '72 ("recording date unknown," say the notes, but I remember Zappa mentioning the date in a radio interview at the time). The digital remastering, in this case, enhances the sound considerably over my first-edition LPs. The signal is higher, and the increased spaciousness is palatable. In fact, all of the advantages possessed by the LP version of Them Or Us (see below) are here retained by the CD. The last two cuts alone make Shut Up worth the admission price, but there's lots more here. Highly recommended. By the way, transcriptions of all solos are available from Zappa's marketing company, Barfko-Swill (818-PUCKIN).

**The London Symphony Orchestra:** This has proven to be one of FZ's most rewarding, challenging releases. The large-scale orchestral works recorded here, while often episodic and lacking in overall structure, are nevertheless endlessly fascinating listening. Zappa achieves orchestral colors that I've never heard before, and his refusal to subscribe to any one school of composition, contemporary or historical, lends a freshness and humor to his work that, sadly, are seldom heard in modern conservatory music.

The sheer statistical density of the composition is mind-boggling. These difficult pieces (and, Zappa promises, at least another hour's worth) were more or less sight-read and
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recorded in three days; the LSO and conductor Nagano labor mightily, and Zappa made hundreds of edits, but there are still a few rough spots, and quite a bit of chair-squeaking and page-rustling. For some reason, FZ decided to delete the LP's "Pedro's Dowry" and "Envelopes" from the CD, substituting the long (24:31) "Bogus Pomp," an expanded version of the suite found on the now-deleted Orchestral Favorites LP, itself an expanded version of "Strictly Genteel" and other incidental pieces from 200 Motels.

The sound is rich, luscious, larger than life. Audiophiles take note: some comments made by Zappa in Digital Audio (October '84) are revealing of a modern, studio-wise orchestral composer's views re. soundstaging and recording: "I conceive the mix before I write the music, because the mix is part of the composition... If a composer has access to all the tools of production all the way down the line, he can optimize the sound for that particular piece. No longer is the composer stuck with one performance in one room... A mixing console is just like a musical instrument." Anathema? Hardly. The LSO is simply an instance of the recording of traditionally orchestrated music in which—because of strict compliance with the composer's wishes—the usual rules, conventions, or mere habits of audiophile orchestral recording simply do not apply. (By the way, when JA auditioned this disc, his two-word comment was, "Good sound." This is also the only full-orchestra recording I've ever seen which not only lists each member of the orchestra, but the make and date of their instruments as well. Even the orchestra administrators are named.)

Of all of these releases, The LSO comes most highly recommended, in terms of sound, performance, and composition. It will reward many listenings and re-listenings.

Them Or Us: When he left WEA in 1978, Zappa pursued quality disc mastering and pressings with a vengeance. One result of this was LP sides that rarely exceeded 17 or 18 minutes in length, allowing for considerable cutter oscillation and LP pressings of digital recordings that rival the CD versions in dynamic range and in every other way. Them Or Us, a satisfying rock collection with many bows to the '50s, is a case in point: not only does the LP put out a considerably higher signal than the CD; throughout most of the recording, the LP's highs are livelier, bass punchier. The CD sound is recessed, as if heard through a scrim; added reverb (check the background vocals on "Sharleena") sounds a lot more artificial. All in all, the CD is tighter, stiffer, more constrained and skeletal, while the LP has a darker, deeper focus (although this reverses a bit on "Truck Driver Divorce" and "Stevie's Spanking"). When better, the CD is only slightly so; when worse, a definite notch below: get the LP.

Oh yes, the music: Zappa has always been the best riff-rocker around, and proves it again on "Stevie's Spanking"; "Be In My Video" is a very funny send-up of MTV, and the album ends with a straightforward, up-tempo version of the old Allman Bros. chestnut, "Whipping Post"; Zappa guitar gourmands can gorge on "Marqueson's Chicken" and "Truck Driver Divorce." "Sinister Footwear II," rumored to have been originally arranged for chamber orchestra, appears here in chamber-rock format.

Thing-Fish: This set, originally released on three not-specially-priced LPs, seems even more of a rip-off when you realize that seven of the tunes (accounting for 35:15 of the 91:08 total) are recycled from previous albums ("No Not Now" reappears twice: once forward, once backward). Zappa justifies such cross-referencing in the spirit of his life-work's "conceptual continuity." But too often these blind-alley borrowings add up to less than the sum of their barely stitched-together parts.

In an album already padded out with endlessly unfunny Amos 'n' Andy-style narration over tedious rhythm tracks, by Ike Willis as the Thing-Fish (get it?), this wears thin pretty fast. The bad taste is admittedly breathtaking, however; there's something to offend everyone here: blacks, gays, feminists, and lovers of Broadway musicals. But the few inspired moments—the Crab-Grass Baby's truly disturbing soliloquy (some of it recycled from Lumpy Gravy), "He's So Gay," and the chain-gang-style vocals on the intro to "White Boy Troubles"—are hardly enough to justify purchase of this 3 LP/2 CD set. The sound is virtually identical in both formats; not hard to do when the LP sides are barely 15 minutes long.

Frank Zappa Meets The Mothers Of Prevention: According to Zappa's note on the European version of Prevention, "The original version of this album contained political material which would not have been interesting to listeners outside the US. This special European edition contains three new songs..." The political material is a 12" Lumpy Gravyish montage of outtakes from that early album, music, snorocks, sounds, and excerpts from the Record Label Hearings of the Senate Committee on Commerce, Science and Transportation—Tipper Gore's infamous "record-rating" campaign. The voices of Senators Danforth, Hollins, Trible, Hawkins, Exon, Gorton, Gore, and Tipper herself, can be heard here. Of the "three new songs"—one blues boogie
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Jazz with added songs, two way the stronger "Wars" — the album's political statement (Zappa, too, testified at the hearings) is all the stronger for it. "Yo Cats," a bitter indictment of padded recording sessions and musicians' union abuses, is delivered in appropriate lounge-lizard mode by Ike Willis. The rest is instrumental, mostly Zappa on the Synclavier DMS, and amply repays repeated listernings.

Jazz From Hell: This, with The LSO and The Perfect Stranger, is one of FZ's three best releases of the last ten years. All but one of the eight compositions were composed and performed by FZ on the Synclavier DMS, built up from both sampled instruments and fully synthesized constructions. Zappa, from this release alone, will probably have to be considered the reigning virtuoso of the Synclavier. Pay particular attention to the album's centerpiece, "While You Were Art II," a meticulously structured exercise in shifting rhythm and fragmented voicings that defies description, let alone any known form of standardized rhythmic notation. The furious "G-Spot Tornado," full of marima-like figurations, and the equally percussive "Massaggio Galore," are also highly recommended. It's a sad commentary on the times that, although "St. Etienne," a typical Zappa guitar jam and the only cut featuring real live musicians, is a relief after all the digital intensity, it's the least interesting musically.

The compositional medium and performing "ensemble" being wholly digital, the CD is the only choice here (the LP is no slouch itself, however). A must-have, and the best introduction for those unfamiliar with Zappa's forays into conservatory music. This brief CD (34:43) could have easily accommodated, however, the whole of Man From Utopia, or Ship Arriving Too Late . . .

More to come . . . For the fall, Rykodisc promises re-releases of Freak Out!, Cruising With Ruben and the Jets, Uncle Meat, Hot Rats, and Joe's Garage, plus You Can't Do That On Stage Anymore, a CD-only twofer compilation of live material from the past 15 years; Barking Pumpkin will release The LSO, Vol. II. Meanwhile, I'm waiting for reissues of One Size Fits All, Studio Tan, Sleep Dirt, and Orchestral Favorites. Watch these pages.

—RL $
Eagle 2A amplifier
Editor:
Please allow me to resolve any speculations implied in the Cheapskate's usage of the phrase “factory direct at $899,” in his report from the Chicago CES (Vol.10 No.5, p.33) when referring to the Electron Kinetics Eagle 2A amplifier.

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Best of all, “factory direct at $899” means that I have more time to spend in the laboratory, doing what I find interesting and rewarding. Upon this you may speculate.

John Iverson
Electron Kinetics Inc.

Buff Stuff CD Saver
Editor:
Like all serious audiophiles, JGH regards mistreatment of LPs and CDs as a sin somewhere short of child abuse. But, accidents do happen—a careless skid against the loading drawer or jewel box, a frisbee shot by a curious toddler, or a landing on a glass table top courtesy of your favorite brother-in-law. Despite all our best intentions, frequently used CDs tend to develop fine cobweb scratches after several years of use.

Even with a small, perpendicular (to the data path) scratch, some error correction is taking place. Like a good double-entry accounting system, the error correction circuits can find the error and correct the data before it gets out of the CD player. But tangential scratches and scuffs block too much of the data, like a missing page in an accounting ledger, and the error-concealment circuits take over. Like a “skilled” accountant, they try to recreate the lost data and bridge the gap with artificial noise designed to blend with the last of the good data.

For audiophiles, whose CDs are all as pure as the day they were pressed, CD Saver is, as JGH says, “of dubious value.” However, audiophiles concerned with the audible effects of error concealment should use CD Saver on any disc that has significant surface damage. And when the damage is severe enough to cause an audible dropout, pop, or mistracking event, CD Saver is essential.

JGH’s comments about the error-correction capabilities of CD players are interesting, but may be based on erroneous criteria. CD players seem to be designed to handle the “simulated scratches” and “finger prints” printed on the surface of the ubiquitous Philips test disc, rather than to correct real scuffs and scratches.

For our own testing, we use a “primitive,” first-generation Technics SL-P10 and a state-of-the-art player reputed to be one of the best-tracking CD players ever made (we won’t name it because the maker was kind enough to loan us the player and it would not be fair to have them singled out). In these tests of CDs with “real scratches,” there was little to choose between the ability of the players to handle scratches.

While CD Saver can’t work miracles on severely damaged discs, it frequently restores discs that were totally unplayable—a fact many other hi-fi reviewers and testing organizations have confirmed. Almost daily, we get unsolicited testimonials from customers who restored discs they had given up for lost.

Finally, if CD Saver is of “dubious” value, are you suggesting we discard our CDs at the slightest sign of a flaw? By the same logic, we should also throw away our record cleaners and discard our records at the first pop!

Maria D. Sell
President, Buff Stuff

Don J Cochran Inc. amplifier
Editor:
We thank you for an outstanding equipment report on our Delta Mode power amplifier. We felt it to be honest, objective, and incisive,
covering both technical and non-technical topics very well.

It was pleasurable and informative working with Dick Olsher during the evaluation. Through faults of mine he wound up with an amplifier having a bad tube. I thank him for regarding this as a problem and not a criticism. Well, out of the mud grows a lotus. We have done a lot of tube evaluation, but had not yet gotten to a recent sample of Gold Aero’s tubes. I sent them to Dick for testing, welcoming his critical ear. He has detailed the results well in the review article. Because of this we have made OEM arrangements with Gold Aero and will be shipping all Delta Mode amplifiers with their Platinum tubes.

We also hear what Dick calls a “lack of bass punch.” We have studied this perception and found that Delta Mode amplifiers produce bass with detail, imaging, and directionality that, to our ear, is generally lost in “punchy”-sounding amplifiers. Good phase response is responsible for this. Just as high-frequency harmonics and overtones must be phase-coherent with their fundamental notes to sound musical, so must low-frequency energy be phase-coherent with its fundamentals.

Regarding the Postscript: Sorry to hear that one amplifier “went unstable” right after the evaluation. I guess it thought it was done. Arrangements have been made with Dick to repair and return it with a description of what went wrong.

The Delta Mode hardware and topology is intrinsically reliable. A key feature in design and construction of the Delta Mode is reliability by conservatively rating all components. Our experience shows these amplifiers are exceedingly forgiving, and tolerate abuses that typically destroy many others. We have a lot of operating hours on units here, but statistical probability of component failure is unavoidable (even in the Space Business).

Again, thanks for a candid and fair review. Don J. Cochran
President, Don J. Cochran Inc.

Counterpoint SA-12 amplifier

Editor:

I would like to thank Mr. Sam Tellig and Stereophile for taking the time to review the Counterpoint SA-12 Hybrid amplifier. The review touched on exactly the goals embodied in the design of the SA-12, namely the liquid musicality of tubes, the detail of solid-state, and a reasonable price. Any sonic failings mentioned by Mr. Tellig are primarily a result of the SA-12’s price point. As my friend Steve McCormick puts it, “Anyone can design a great product if cost is no consideration.” Designing an excellent component at a realistic price is much, much harder. We are pleased that Mr. Tellig found “that the compromises do so little to detract from one’s enjoyment of the music.”

The solution to getting rid of “that MOSFET fuzz or haze that (Sam Tellig has) bitched about with other amps,” is a simple one, but the discovery of it turned out to be a laborious procedure that stretched over several weeks of late-night experimentation using three dum-
my heads, some good wine, an 8 by 10 color glossy of Fawn Hall, several kitchen utensils, and a Pekinese. Being no fool, and understanding the statutes of limitations, I will disclose neither the methodology nor technique here.

By the way, I have, buried in my lab, a bunch of SA-12 prototype designs that we listened to and discarded. There are some real dogs in there. We're talking chunks of perfboard with parts dangling in the air, explosion-in-a-spaghetti-factory style. Readers wishing to purchase them are welcome to submit (cash) bids to me. Send them to the "Hon. J. M. Elliott Retirement and Supper Fund," care of this station, and the winner will receive a carton filled with, well, really swell stuff. It should be understood that none of the boards function in any fashion recognizable by science (perpetual motion supporters take note), but the raw parts can be crafted into stunning cufflinks and tie clasps. All unopened bids will be returned. No warranties expressed or implied. Member FDIC.

J. Michael Elliott
President, Counterpoint
Electronic Systems, Inc.
San Diego, CA

Onix BWD1 FM tuner
Editor:
I would like to thank Don Scott for his favorable (if guarded) review of the Onix BWD1 FM Tuner. Although the review is good, I somehow get the feeling that Don missed the point of why the tuner does what it does so well.

First: Don says that you need a directional antenna "to receive adjacent stations if one is 20% stronger than the other." Perhaps this is true in the hinterlands of Connecticut, but in the New York area (where the sample reviewed now resides) I find no such problems with an almost full FM spectrum. (This is using the omni-directional Magnum antenna that looks like a car antenna.)

Second: Here is the crux of my dispute with Don. He says that the Onix sounds best on properly engineered classical stations, etc., and it doesn't do well on heavily modulated (improperly engineered?) stations. In the world of hi-fi that I reside in, a component can at best reproduce faithfully the signal given it. Therefore the tuner that reproduces a good signal well can only reproduce a bad signal well (i.e., it will sound bad). The people at Onix designed the tuner to be considered a source component like a turntable or (God forbid) CD player. In my book, a tuner that highlights the failings of a poor station is indeed a rare thing, and should be acclaimed, not criticized.

Finally, Don wishes that British manufacturers would build tuners specifically for North America. I fear that if they did, the tuners would sound as bland as the Japanese and American tuners currently available.

Roy Hall
Music Hall/Onix

Audio Research SP9 preamplifier
Editor:
The overwhelmingly positive response of the world marketplace to the Audio Research SP9 preamplifier makes Gordon Holt's reaction more than a little puzzling. In response, Audio Research Corporation would offer the following considerations.

Our experience and working knowledge of the SP9, both during development and as a current production model, as well as the experience of more than 1000 SP9 owners to date (happy owners, they tell us), make us confident that the SP9 is both highly accurate and musically appealing. Indeed, we would have no interest in attempting to market a product which sounds like the one Holt describes. And, since we must assume Gordon in fact heard what he described hearing, we are led to the question of why such a discrepancy exists.

According to our quality-assurance and sonicevaluation records, the SP9 sample that had been shipped to Stereophile was a normal production unit in every respect; furthermore, upon return to the factory (after the review was written), the unit measured and sounded entirely within normal specifications. We can only conclude that the unit in question was neither defective nor atypical.

It is possible that an unidentified systemcompatibility problem may have caused the less than outstanding results that Holt experienced. In this light, it is worth noting that Holt had occasion to use a step-up transformer for the SP9 phono input, which may have introduced some aberrations like those he describes. We are investigating this possibility, and should this particular step-up transformer exhibit an impedance characteristic that limits the performance of the SP9, Audio Research
will make every effort to restore full compatibility.

Barring a system incompatibility, we must then assume that subjective differences of opinion prevail. Given Holt’s surprise at the wide discrepancy between his response and that of other respected reviewers, we are puzzled that no one from Stereophile contacted Audio Research to ask a question or two about what they were experiencing, or even to request another sample.

A further note of interest is provided by our Importing Distributor for Audio Research products in Great Britain, Ricardo Franassovicci, of Absolute Sounds (no relation to the American publication). Franassovicci, a leading figure in the audiophile community of the UK, reports that following the recent Penta Hi Fi Show in London, Stereophile staff members Gordon Holt, John Atkinson, and Larry Archibald attended a demonstration and comparison of the SP11 and SP9 using a system set up by Absolute Sounds. The system was comprised of a Goldmund turntable, Kinergetics CD-30 CD player, SPII/SP9 preamps, Randall Research Interconnects, Goldmund Mimesis power amplifier, MIT Shotgun speaker cables, and Magnepan 2.5 speakers.

Franassovicci reports that after listening to both the SP11 and SP9 line sections in sequence (a comparison of phono stages was not requested), with the products in view, the Stereophile staff felt the SP11 was clearly superior to the SP9, being more accurate musically. (Audio Research has never minimized the very real differences between the two products.) Yet a short while later, in an informal single-blind test consisting of four trials, with levels matched to within 0.1dB, Gordon Holt failed in every case to correctly identify whether the SP11 or SP9 was playing; when the SP11 was playing he believed it to be the SP9, and vice-versa.¹

Now, while we are not champions of blind testing, it is nonetheless puzzling that a reviewer who claims the SP9 sounds “...so completely different from the SP11” is quite unable to identify which preamp is which in a relaxed, informal setting using high-quality gear. Even though the system may have been unfamiliar, it was certainly competent enough to reveal important differences. We understand that JA fared somewhat better in this test, while LA refused to take part.

In conclusion, there is one point made by John Atkinson with which we heartily agree: Stereophile readers interested in the SP9 should take neither his nor Holt’s words as gospel. Instead, go to your nearest Audio Research dealer, who will happily and unflinchingly demonstrate for you the real musical merits and genuine price-to-performance value of the SP9. Then, simply decide for yourself who has told you more of the truth—your own ears, or Stereophile.

Terry Dorn
US Sales Manager, Audio Research Corporation

Eminent Technology II tonearm

Editor:

Thank you for sending me a copy of this article. While I agree with some of the findings, and disagree with others, this kind of article is excellent, and maybe readers will ultimately learn something about tonearms from it.

There were some technical errors, and one error in the description of the Eminent Technology II tonearm. It does have an azimuth adjustment allowing about ±6° of rotation.

Interestingly enough, I do not disagree with the results of the listening test (pivoted arms being brighter sounding), as they back up my findings. Over the years, many of our customers have described the sound of our tonearm as being slightly less bright than pivoted tonearms they have used, but preferred it because of that.

Pivoted arms certainly have an advantage in terms of ease of use and set-up. On average, they are far less costly to manufacture, and predominate the market as a result. Straight-line tonearms for audiophiles have a history of being finicky mechanical contraptions. We are, hopefully, one step removed from that, but still more complicated to understand than pivoted arms. The best of the straight-line and pivoted tonearms require careful installation and set up. If the user understands the ET-II, the mounting jig is not necessary for accurate set-up or cartridge alignment.

The causes of the sonic differences are probably not the result of resonances within the tonearms. I would be glad to write an article explaining why the audible differences found by Stromeyer and Greenspurn exist, and the

¹ For a full discussion of this test, see p.115. —JA
types of tests necessary to document them. For good pivoted and straight-line tonearm designs with sufficiently low-resonance signatures, the pivoted tonearm (I know of a few exceptions) will always sound slightly brighter. There are clear-cut measurements which explain why.

If Stereophile accepts, the reader can then decide which type of tonearm is really best for their application.

F. Bruce Thigpen
President, Eminent Technology Incorporated

Rowland Research Coherence One and Model 5
Editor:
Thank you for the detailed and comprehensive review on the Coherence One Preamplifier and Model 5 Amplifier.

A last-minute discussion with Mr. Lipnick revealed that the Coherence One he tested did in fact have a defective balance control. This caused the lack of overall focus which he mentions in the review. We recently sent him another preamplifier, which reportedly corrected the anomaly.

I believe that all music lovers will welcome new perspectives into audio-equipment performance such as the ones discussed in the review. The insights help provide a clear direction for not only expanded music perception, but also audio design and development.

Jeff Rowland
President, Rowland Research

Quadrant Q-250 loudspeaker
Editor:
Thank you for the timely review of the Quadrant Q-250 loudspeakers.

Quadrant chose to design a speaker system that is well balanced and musical as well as attractive and reasonably priced. Your review confirms that these goals were successful. Nothing being perfect, we have noted Mr. Atkinson's test results and conveyed them to the manufacturer.

The spring clips will be upgraded to 5-way binding posts and the Quadrant stands will be spiked. The cabinet resonances will be closely evaluated and dealt with in a suitably cost-effective way.

We have to agree with Mr. Atkinson's assessment that "the whole is rather better than the sum of the parts"! We will make every effort possible to insure the products we provide are high-quality and user-friendly. Thanks again for including the Quadrant Q-250s on your recommended list.

Brian V. Bolger
Audiophile Accessories, Inc.

Versa Dynamics turntable and tonearm
Editor:
Thank you for the fine review of our first product. We have worked very hard at creating what we think is a fine record player and it is gratifying that you agree.

Our requirements for this product are that it not only provide unparalleled sound, but do so with very little fuss through years of service. To that end we have addressed your criticisms and believe them remedied.

1) Cueing problem—Cueing drift ceased as of mid-September. The problem, of course, related to insufficient friction where the arm slider contacts the lift/lower beam, sometimes complicated by forces generated by the air-hose loop. We have changed both the hose loop and the friction pad. The new specification provides complete cueing stability down to 1gm tracking force. Both of these changes have been in production since mid-September, and all systems have been updated free of charge.

2) Compressor noise—We have not experienced quite so dramatic a problem as you describe, nor have any dealers. (By the way, it would have been only fair of you to reiterate just how quiet your listening environment really is!) However, we appreciate that the compressor isolation could be improved, and have done just that. As of October, the compressor unit will be changed in the following ways:

a) Floor transmission—We are changing the compressor mountings from elastomeric types to springs. This reduces the output to a typical floor by an enormous 35dB. Problem solved! Unfortunately, this change requires a slight increase in the size of the Noise Reduction Enclosure, so is not updatable. We will, however, supply (free of charge) springs for use as external feet. We have tried this, and it is just as effective though not as handy.

b) Acoustic output—We are changing the compressor configuration so that the two pistons run out of phase. This reduces the
acoustic output considerably. A recent test in a typical installation indicated a 12dB reduction of the 29Hz fundamental, and 6dB reduction of the second harmonic.

3) Minor quibbles—Although induced hum and motor noise are at or near the preamp noise floor using more conventional MC cartridges, we are perfectionists and didn’t want MC 2000 owners to feel left out: a revised chassis-grounding scheme has reduced these noises an additional 10dB.

Moisture should never have appeared on the arm bearing, as our moisture accumulation “time constant” has considerable safety margin even in very humid weather. We expect that either the regulator in the compressor unit is incorrectly set, or that you have laid the compressor unit on its side with the moisture trap full, allowing some water past the trap. In either case, as you point out, it is not a serious problem.

Points of interest:

Although I understand that you were not able to verify the vacuum level, I assure you that we use 5-6"Hg. Anything less than this is not able to maintain adequate record-to-platter contact.

It is not that I don’t believe the plasticizer theory (after all, we use the above-mentioned low vacuum to avoid any such potential problem), it is simply that dust is a problem that seems to have been overlooked. Simple math supports that a 0.1psi force evenly distributed on the back of a record will cause a particle with a flat surface of 0.003" x 0.003" to exceed the 10,000psi yield strength of PVC. Moreover, most dust particles have quite a bit less surface area (making matters worse), and undoubtedly are much harder than PVC (being fibers from clothing and furniture, dirt which is minute rock particles, and fibers from record brushes, which are carbon fiber).

Notice that the example not only makes it perfectly clear that dust is a problem for vacuum systems, but that even a record clamp’s few pounds of force can cause problems.

However, the “obvious solution” of a soft mat (be it felt or elastomer) has severe sound-quality limitations. Experiments have shown that so little a compliance under the record as tissue paper seriously deteriorated the sound. It has been no small problem to develop a material that allows complete embeddability for dust while having little effect on the sound.

But as you note, the experimental one in your possession achieves that goal. This “mat” will be in production by the end of September, and will include a light adhesive on the back.

We hope that these changes will eliminate your slight reservations about our product and add to everyone’s pleasure in ownership.

We are pleased to announce that we have added two more dealers in the past week, and so now have six in addition to several overseas distributors.

John Bicht
Versa Dynamics

**Onkyo M-504 power amplifier**

Editor: Thank you for the opportunity to comment on the review of the Onkyo M-504 power amplifier.

We inadvertently did not provide the reviewer with one of our product brochures, which specifies EIA dynamic power output into various load impedances. For the record, dynamic power output of the M-504 is 210W into 8 ohms, 350W into 4 ohms, and 530W into 2 ohms, per channel. We’ve tested this amp with paired sets of 4 ohm speakers, and it runs with no problem.

Frankly, we are quite mystified about the tone of some of the reviewer’s comments, especially his comments about our marketing intentions and distribution. While it is certainly true that we offer a very broad range of products, and we can certainly be classified as a major manufacturer, the reviewer seems to infer that audiophile quality and ease of availability in the marketplace are mutually exclusive. Naturally, we disagree.

I would think that a reviewer writing under the banner of “The Audio Cheapskate” would be pleased that a major manufacturer such as Onkyo is active in the audiophile arena. Knowing that the Cheapskate is of a generally cheerful nature, I must assume that he is giving us a compliment, albeit a back-handed one.

David Birch-Jones
Product Manager, Onkyo USA Corporation

**Graham Engineering tonearm**

Editor: Thank you for the opportunity to comment on this, the first public discussion of my tonearm design. Since this test was conceived primarily for the purpose of devising another ap-
approach to tonearm/cartridge testing, and not a full-scale review of either tonearm, much of the relevant design information was not included in the article. A formal review would be the place to discuss that, but I would like briefly to mention a few points.

The neutral balance mentioned in the article is desirable for any tonearm, and some other arms besides mine approach this goal. My intent, however, was not to focus just on one idea (ie, balance, rigidity, bearing design, etc.) at the expense of other details, but to combine everything I could think of that would make a genuine contribution to the performance of the design. The patented vibration control of the arm tube is, for example, one of these goals. The entire forward arm tube and counterweight are quickly removable, the arm tube being held rigidly in place by an unusually strong aerospace connector. This feature allows for a unique system of tonearm and cartridge installation which is quicker and more accurate than any other tonearm of which I'm aware. The azimuth can be changed by turning the side weights, and they will not drift out of adjustment.

The arm in the report is now about three models old. The possible problem mentioned whereby the arm could slip out of one's hand and land in the area of a record clamp with holes in it is valid. A record clamp should not, I think, have such booby traps in the first place because anything *can* happen; nevertheless, I have since redesigned the pivot area so that the arm can only swing from the arm rest to the run-out grooves of the record.

Also, the arm under test had lead wire which was, to use the wine-taster's phrase, very undistinguished. It was just plain ol' commercial-grade copper. Subsequent testing, of course, has shown the light, and the production units will all have silver van den Hul throughout.

As this is being written (September), I expect delivery of the component parts within a few weeks and then we will build the first 50 units. These tonearms, and the literature describing the design, should be available just when this issue of *Stereophile* is mailed.

Robert J. Graham
President, Graham Engineering

Micro Seiki RX-1500 turntable

Editor:
I read Steve Watkinson's review of the Micro Seiki RX-1500 turntable and I really want to thank you for sending it to me. I haven't had such a good laugh in a long, long time.

Although the Micro 'table comes equipped with all of three whole buttons, Mr. Watkinson was apparently unable to figure out the function of at least one of these. He states: "the platter won't turn unless the vacuum is on." Incorrect! Of course, one may play a record either with or without the vacuum effect working. This is controlled by a twist knob on the motor unit. Did he not know this? Was he not able, in several weeks, to figure it out? Did he mean "the platter won't turn unless the pump is on"?

Yet he then states: "Both switches had to be turned on and off every time the record is changed." Wildly incorrect, and if this is done, the platter will crash down onto the glass subplatter without air to lift it, thus marring it, and making the turntable unable to rotate properly! These two areas are separated by just 3 microns of air, and if scratched or damaged beyond 3 microns, clearly the solid bronze cast and machined platter *cannot rotate perfectly any longer.*

Thanks, Steve, for the care used in giving this player a proper test! (And you never called us once with a single question.)

Is anyone at *Stereophile* willing to publish the review written on the Micro by your record reviewer up in Denver? One assumes that if he had ability enough to be your record reviewer, then he knew something about sound quality, too. He wrote an article over a year ago, but mysteriously it was never published. And by the way, he thought the Micro so decidedly superior, that he bought one! But I guess he had tin ears.

Steve, your review had everything in it but "watch out for the yellow peril." Note that the Micro center spindle weighs in at four pounds, the flimsy SOTA at a few ounces, ditto the quality of the respective platters, and I see that in one place the Micro "betters the SOTA" and "had extremely high level of fine detail, excellent image stability and depth of soundstage," yet finally was good enough only for "yuppie technofreaks" (those nasty *nouveau riche* who are trying to be like "us" but who will never, ever, succeed). You know, we haven't sold one to a yuppie yet—just to advanced audiophiles (and record reviewers) who think the Micro makes the SOTA and Linn
look like the toys that they are.

James R. Miller
Analog Excellence

PS: We don't have 20 dealers as you so kindly stated; we actually have none. Could this, and the lack of free samples and/or paid advertising, have any connection with the above? I dare you to print this in its entirety.

It is rare for us to receive a Manufacturers' Comment voiced in such intemperate tones; embarrassing, I'm sure, to Micro Seiki, who are striving to make the best turntables and tonearms they can. I am dismayed that Mr. Miller did not address the substance of SWW's review: that the Micro turns in a substantially respectable performance—not, in his opinion, as good as the SOTA Star Sapphire, which costs about 40% as much.

For the record: The twist knob referred to by Mr. Miller was inoperative on SWW's sample (the vacuum did not release when the knob was turned), which is why SWW concluded that it was necessary to turn off the vacuum motor (which also supplies air pressure to the turntable air bearing) in order to release the record at end of play. After one episode of turning off the motor and bearing the platter 'clunk' to a stop as the bearing disappeared, SWW was careful to always stop the platter's rotation before turning off the motor. SWW has examined both the platter under-surface and the piece of glass on which it rides (separated by air), and could see no scratches whatsoever. In any case, if one such episode can damage the platter, the Micro would be a scary device to own: What would happen in the event of the power outages so common in some parts of the country?

In addition, there is no evidence that the platter was turning improperly, given that SWW found that it had speed regularity (which I surmise would be the first thing affected by platter damage) on a par with the Star Sapphire with Electronic Flywheel.

Bob O'Neill, the "record reviewer up in Denver," did indeed buy a Micro RX-1500, but no review was ever commissioned from him, nor did he submit any copy to Stereophile. At the time of his purchase, the price of the RX-1500 was only $2700.

The figure of 20 dealers was supplied by Mr. Miller's employees at Analog Excellence.

—LA
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