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COMING ATTRACTIONS

You asked for it; you've waited patiently for it to reappear; manufacturers have waited with bated breath—yes, the April issue will include a fully revised edition of Stereophile's authoritative "Recommended Components" feature. From cost-no-object components down to those that real people can afford to buy, we give the lowdown on what we recommend and why.

Featured equipment scheduled to be reviewed in Vol.11 No.4 includes the Prism (the latest CD player from The Mod Squad), an exciting Canadian preamp from Dolan Electronics, Sumo's Samson subwoofer and Dellilah crossover combination, and speakers from DCM, Nelson-Reed, and PSB. In addition, Keith Yates will examine one of the most promising room-acoustic treatments, the tantalizingly named Reflection Phase Gratings.

And April sees the return of the Cheapskate! Sam Tellig, fresh from his sabbatical, gets excited about turntables—including the Versa Dynamics!

In the Music Section, we hope to include up to 20 pages of record reviews in every issue; April sees Richard Lehnert, fresh from his Lobengrin review in this issue, tackling two new recordings of Wagner's Parsifal, as well as continuing his mammoth survey of Zappa on CD. Interviews with Michala Petri and Ofra Harnoy are in the works, Lewis Lipnick has put together a complete report on a classical recording session, including the politics, engineering, choice of program, and performance, and Stereophile's search for black vinyl will continue in New York, with Mortimer H. Frank acting as your tour guide.

Works in progress due to appear in the next two or three issues of Stereophile include Dick Olsher's hopefully definitive survey of loudspeaker cables, J. Gordon Holt on cost-no-object loudspeakers, Lewis Lipnick on the Krell 100W mono amplifiers, Arnis Balgalvis on the Apogee Divas, and full reviews on the Lurne turntable, the latest Oracles, and new gear from Mark Levinson—the No.26 preamplifier and No.23 power amplifier. Thomas J. Norton and I will be looking at a host of under-$1000 loudspeakers, and I will also spend time with British amplification from DNM and a complete system from Linn Products.

Also in April, don't forget Stereophile's second West Coast High-End Hi-Fi Show, due to take place in Santa Monica—see the ad on pp.38 & 39 for full details and how to save money by ordering tickets in advance.

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Stereophile, March 1988
Every once in a while, and particularly around the first of the year, news writers (of which I am one) get the urge to play oracle, laying our credibilities on the line by attempting to divine what the coming year will bring. Since I am writing this at the end of January, the chances of my miscalculating my shots have already been reduced by a factor of 0.083. But there are still 11 months to go, and some possibility that a prediction or two may be wrong. Nonetheless, I shall intrepidly grab the bull by the horns, the crystal by the ball, and the opportunity of the moment to take an educated guess at what the rest of 1988 holds for audio.

First, DAT. I predict that the Electronics Industry Association of Japan will issue a joint statement announcing that consumer DAT machines will definitely be available in the US by the Spring of 1996, "at the very latest."

The number of recordings of Vivaldi's *The Four Seasons* will top 100 by the end of '88, prompting an unprecedented convention of the entire recording industry to consider a 20-year recording moratorium on the work. The motion will fail to pass, by 101 votes.

The phono cartridge to end all phono cartridges will not be invented in 1988. That will not happen until 1991, after the last of the vinyl disc-stamping machines is installed in the Smithsonian Institution.

The Anglicization of *Stereophile* will become complete when LA is granted British citizenship by Her Majesty, the Queen. Her Royal Majesty, while signing the papers, will be heard to mutter "And about time, too."

A new company will announce The Ultimate Minimalist Line Switcher. Touted as "The Cheapest Way to Do It Best," it will consist of two 1m shielded interconnects.

An obscure inventor will submit to the Audio Engineering Society a paper describing a simple holographic digital recording process that reproduces up to 2 hours of flawless sound from a 2 1/4" square of optical film, via a player that will cost $5.80 to manufacture. Neither he nor his paper will ever be heard of again.

*Stereo Review* magazine will publish an article offering conclusive proof, supported by irrefutable statistical evidence, that under carefully controlled conditions it is impossible to distinguish an oboe from an English horn. It will assert that people who believe they are playing an English horn are deluding themselves, and are actually playing an oboe.

Telarc Records will not announce that, in future, all their recordings will be done using Bruel & Kjaer's new cardioid microphone. Defending their continuing use of spaced omnis, producer Bob Woods will say, "If God wanted us to hear imaging, he would have put our ears 8" apart."

In a book chronicling the history of com-
The New Electronic Q Deck
— winner of What Hi-Fi's 1988 award for best turntable and a prestigious Chicago C.E.S. Design Award. The Q Deck has established itself as the leader in its market place.

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munications giant RCA, a top executive will admit that their infamous phono plug was all a misunderstanding. "We proposed it as a put-on—you know, for April F. — but then it kinda got out of hand," he will be quoted as saying.

A) van den Hul will offer the first superconductive loudspeaker cables to well-heeled audiophiles. The company's "Karajan" cable set, which will be touted as the first perfect amplifier/loudspeaker interconnect, will cost a mere $43 per running foot. The refrigeration system needed to make them superconductive will cost $31,000, regardless of how long the cables are. (A line of lightweight, compact airline luggage will be introduced shortly thereafter under the same name.)

John Bedini will announce his discovery of A-waves, an entirely new kind of energy by which electromagnetic signals within a 10Hz to 30kHz frequency band are conveyed directly from the original recording microphones to the auditory centers of the brain. At the same time, he will introduce a complete line of devices which tap this hitherto unknown force in order to provide dramatically improved soundstaging, dynamics, depth, inner definition, low-frequency range and impact, midrange accuracy, and high-end openness and detail.

The well-known home electronics chain, Timothy Tweeter, will enter the high-end audio market with a flagship monoblock power amplifier, "The Gargantuan," featuring 2 kilowatts of power into a 1/2 ohm load, 5 Parads of power-supply storage, and its own regulated and fully stabilized diesel-turbine power generator. A hydroelectric generator will be announced as a future option.

On April 1, John Atkinson, editor of Stereophile since January, will yield to the weight of pressure from readers by announcing that all of Stereophile's contributors, including himself, will be replaced by Anthony H. Cordesman—after Tony's British citizenship becomes final.

A talent-booking service in San Francisco will offer the local symphony orchestra for rent by the evening to well-heeled audiophiles who "won't accept substitutes for the real thing." Written proof of a large living room will be required.

Enid Lumley will report in an issue of International Audio Review that reproduced sound is affected by the day of the week. Claiming that odd-numbered days make the sound rough and veiled, she will advise that any calendar in the room be turned off or removed while listening to records.

The American music industry will mount a campaign to outlaw listening to recorded music by persons who did not actually purchase the recording. The bill's sponsor, Arthur W. Venal, will be quoted as saying "America's creative talents are being deprived of billions a year through this scurrilous practice, which is in obvious violation of the law we are trying to get enacted."

Wilson Audio Specialties will announce the availability of their most expensive product ever, "The Carnegie" — the world's first prefabricated listening room for audio perfectionists. Interviewed by Audio magazine about it, Dave Wilson will be quoted as saying "what the heck, most people just don't have space in the den for a WAMM."

Sometime toward the end of 198?, Eugene Pitts III, Editor of Audio, will take over the helm of The Absolute Sound after TAS is bought by High Fidelity. Harry Pearson can't decide whether to devote himself full-time to The Perfect Vision or to enter the political arena, thus bringing it a much-needed dose of charisma.

The descendants of Lee DeForest, inventor of the vacuum tube, will bring suit in federal court against Conrad-Johnson Design, for patent infringement. Litigation will continue for 18 years, and the case will be settled out of court with acrimony at 11 paces. Neither side will win.

Laserdisc Corporation of America will announce a program to re-release all LaserVision discs of Hollywood films with closed captioning for the deaf. The promotional campaign for their "See-Say" LVs will feature endorsements by internationally famed dyslectic John (JB) Harris (Hasusi).

Peter Belt will announce the discovery that the mysterious force his devices have been counteracting is actually a gravitational field spilling over from a parallel universe into our own, and that he will celebrate this discovery by establishing a church, a college, and an alternative broadcasting network.

JGH will confess in Stereophile that he declined an offer by Ray-O-Vac to endorse their hearing-aid batteries for a national advertising campaign. His excuse will be "I never use 'em; they have lousy high end."
Digital High Fidelity Systems including Compact Disc, FM Stereo Radio, Amplifiers, Active Loudspeakers, Full Remote Control and Multi Room distribution systems.
Not as good?
Editor:
Stereophile is not as good as Stereo Review. And it only talks about extremely expensive high-end equipment. Robert Gibbons
San Jose, CA

But more informative!
Editor:
I subscribed to Stereophile in December because there was nothing to lose; I could cancel if I was not satisfied. Let me tell you this, I was very impressed. I already subscribe to Audio and I feel your magazine is much more informative. Natalie Rollins
Redington Shores, FL

Try to do even better
Editor:
First, let me assure you that I enjoy Stereophile immensely, and have for several years. This remains true when I disagree with you, or even when I think you have done something obviously absurd. (Exquisite detailing of impossible differences between jillions of interconnects comes to mind.) But hey, guys, you can't have it both ways. JA's response to Elliott Men- nen's letter (Vol.11 No.1) relies on statistics, ie, measurements, to refute Mr. Mennen's subjective assessment of the creeping Anglicization of Stereophile. Just as measurements don't reveal subtle differences in components, statistics don't tell the whole story in this case. In addition to patently British reviewers, he and I and many others dislike what we perceive to be subtle British slants in editorial policy and overall magazine content. It's not necessarily bad, but just as British humor often falls flat on American audiences, the current direction of Stereophile is similarly non-satisfying.

We are distraught over the departure of Anthony H. Cordesman; we see J. Gordon Holt's new position as a demotion, no matter what you say, or even what be may say; Alvin Gold has yet to say anything of even remote interest. Remember, all this audiophile stuff is supposed to be fun. It's not really very important in the overall scheme of things. Try to be a little more sympathetic to our concerns, even if you think they are (statistically) unfounded. Please us or lose us.

Thanks for your time. I could spend some more telling you the many things I do like about Stereophile, but that's not as interesting. Keep up the good work, and try to do even better. Edwin S. Beekenbach
Tujunga, CA

Thumbs up
Editor:
This short letter is to let you know how much those of us a Thumb Down Audiophile Society enjoy Stereophile. The new direction in which LA has steered the magazine is great, and to those whining about changes, we say, let 'em cancel.

Mr. Tellig's Audio Cheapskate column is a superb feature. His recent advice about purchase of a cheap cassette deck for home use in lieu of a megabuck model (a la Revox or Nak) is some of the soundest (no pun intended) guidance ever offered in your publication. Bravo, Sam.

JGH's opinion of the ARC SP9 is well-founded. An initial reaction here to the SP9's ability to interpret Philip Glass's The Photogra- pher Act II on CD was as though one was listening with a burlap bag on one's head. Some time ago Mr. Holt asked for casual input on listener history with Spica's TC-50. One of our esteemed members purchased a pair from Orange County's Absolute Audio not long ago, and subsequently blew out the low-frequency driver on one of the speakers. It was being driven by a Yamaha R-9 (certainly a no-slouch receiver) at less than 5W, and has never tackled anything louder than FM 94.7 ("The Wave") at background level. The speaker (s/n 6023) is being serviced by the gang at Absolute.

The end of the analog LP is within sight, and hopefully the Stereophile folks will recognize that the CD is now the reference standard in home high-fidelity listening. Claiming that the

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LP is superior to the CD is akin to holding on to the belief that the *Titanic* is unsinkable. Maybe in ten years one will be able to locate a record in much the same fashion you can now lay hands on cylindrical recordings.

As for obsolescence, we have found a great deal of support to argue that such antiques as the BIC 960 and Technics SL-10 sound every bit as good as today’s fading “super platters.” Best CD player? Much arguing here; I personally feel the Magnavox 460 is the greatest player ever made. Some of us say Sony; there is a general consensus that, quasi-18 bit or no, Yamaha is out.

Best speaker? B&W 801 Matrix—great review, Mr. Lipnick! As much as we love the Apogees, great cost and generally finicky handling preclude their consideration. Maybe the Calipers will catch on with the general public and help rid us educated-ears types of the placebo stereotypes too many of us enjoy.

Best electronics? No tube hardware can be taken seriously, as it reflects an intransigence to leave the 1920s. For the buck, B&K. Personally, this product convinced me that a non-pure-class-A amplifier could seriously be considered a real amplifier.

Finally, double-blind testing. LA’s personal orientation to this ongoing debate is probably the most logical some of us here have heard. Has the *Stereophile* team ever thought about trying to duplicate *Stereo Review*’s methodologies? Hearing is believing; ol’ Bill Livingstone’s efforts in these testy waters must indeed be taken as milestones by anyone seriously debating sound nuances.

Great magazine! I’m beginning to think the most erstwhile [sic] addition to my system is the next copy of your publication.

**Kerry White**
*Thumbs-Down Audiophile Society*
*Los Angeles, CA*

**Thumbs down**
Editor:
I recently resubscribed to *Stereophile* and I am disappointed. While I am not disappointed enough to cancel, I’ll give you until my subscription runs out to improve. I used to subscribe in the ’60s, and I am now horrified to see that you take advertising.

I am also appalled at your choice of contributors. . . How well do you screen your applicants?

The main subject of this letter is Barbara Jahn. In your November 1987 issue, her “Building a Library” article focused on Liszt’s Sonata in B Minor. In such a column, she should say *something* about *all* the currently available recordings and mention the outstanding ones of the past as well. In this duty, she was sadly remiss. While there are, admittedly, over 20 recordings in *Schwann*, she could try to listen to them all at least once, dismiss the obviously weak ones, and compare the top few. There are three outstanding performances which should have been included in her column.

First, in her review of historic performances, she omitted Simon Barere’s Remington recording of a 1951 Carnegie Hall performance. This, not Horowitz’s, is the generally accepted historical standard. It needs all the publicity it can get so it can be re-released by somebody. Further, this amazing recording is so well documented in the literature that any record reviewer worth her salt and living in an urban area should be familiar with it.

Second, if your magazine is aimed at high-tech audiophiles, why did Ms. Jahn ignore two wonderful performances of the Sonata in B Minor by two of today’s greatest pianists, both on CD? My favorite of the two is septuagenarian Shura Cherkassky on Nimbus, while others prefer the youthful (but mature) Dezső Ranki on Denon. No discussion of the Liszt Sonata in B Minor is complete without mentioning these two.

*Shape up!*

**John P. Dahlquist**
*Oakland, CA*

**A mistake, obviously**
Editor:
Please convey to Tom Gillett my strong disagreement with his assessment of CBS MYK 36720 (CD), Beethoven’s Symphony 6 performed by Bruno Walter and the Columbia SO, which Mr. Gillett reviewed in the October 1987 issue of *Stereophile*. On the basis of his strong recommendation, I made the mistake of purchasing a copy.

The sound was terrible, about what I would expect from a worn-out LP played on a rack system from K-Mart. The program notes inside the jewel box belonged to a different recording. The disk had enough defects to intermittently mute my player. Fortunately, I was able to return it to the vendor for credit toward a better recording.
I have heard rumors that CBS is quietly releasing CDs with the copy-protection notch in the frequency spectrum. It would be a service to your readers to warn them of this if ever such a recording is reviewed.

Kendahl Shane
Omaha, NE

A spendthrift? Surely not
Editor:
I finally caught on. The biggest fraud in high-end audio can be found in Stereophile. No—it's not platinum interconnects or Belts' reactive electret foils (made from aluminum?). But, Virginia, it's none other than the Audio Cheapskate—Sam Tellig from Wilton, Conn.

First, he pretends to be interested only in low-cost audiophile equipment. Then he idolizes it and writes special articles about it. Finally, he goes home and listens to Conrad-Johnson equipment. He is no cheapskate.

Sam has the audacity to claim, in Vol.10 No.8, that "Conrad-Johnson makes good-sounding stuff" (no argument) "that people can afford." What people? This is where the so-called cheapskate is uncovered for what he really is—a spendthrift. The good-sounding Conrad-Johnson equipment that Sam listens to retails for about $3000!!! That's just for a preamp and amp, and all he gets is a measly 45W. Is this a cheapskate? A real cheapskate would have put together a system right out of Stereophile's recommended list for less than a half of what Sam's cost, and would have gotten 200W. Ladies and gentlemen, I rest my case.

Ed Selvig
No address supplied

Numbers guarantee nothing
Editor:
In a recent letter (Vol.10 No.9), Chuck Butler takes issue with some of the thinking that has been applied to the problem of speaker cables. I would like to suggest that Mr. Butler is taking a rather unrealistic approach to science and the scientific method.

Throughout his letter, Mr. Butler uses the term "objective data." How do we decide exactly which data are objective? Simply by consensus. There is no computer yet devised that can tell us what is "objective." It seems that Mr. Butler wishes to decide what is objective and what is not. But this is not his privilege, nor mine.

Objectivity is not guaranteed by expressing one's opinions in the form of numbers. Numbers guarantee nothing. To put it bluntly, there is nothing easier to fake than a number. It is now known that Gregor Mendel faked the numbers when he reported his breakthrough experiments in genetics. He believed so strongly in his ideas that he fudged the numbers to make "objective data" agree with his theories. And now we know that Mendel was right. Not because of his numbers, which were faked, but because of his vision. So put not thy faith in numbers, friend!

Must any "meaningful" theory be based on "known and accepted concepts," as Mr. Butler suggests? Surely not! Progress, in science as well as everywhere else, requires that we go beyond "known and accepted ideas." It was well known and accepted, and rather recently too, that the earth was flat, that traveling at speeds greater than 15mph would suck the air out of your lungs and kill you, and that atoms were hard little spheres that could never be split. Well-known ideas generally disagree with new ideas. But this does not prove that all new ideas are wrong.

Mr. Butler says that "we have no idea what 'information' is." Do we know what gravity is? And if we did know, how could we put our knowledge into everyday language? Gravity is what makes apples fall downward, and the faster the apples fall, the more gravity there is.

Correspondingly, information is the interesting and meaningful part of an incoming stream of data, or the interesting and meaningful part of the output of a loudspeaker. As we receive information on pitch and frequency, dynamics, and many other aspects of a recording, we mentally translate this into the impression that we are hearing music. The better the information we receive, the more faithfully we can mentally reconstruct a musical performance from the digital impulses transmitted from the ear to the brain by the cochlear nerve.

"But where are the numbers?", Mr. Butler may ask. Numbers are not necessarily required to undertake good and useful science. Heresy! Madness! But if I am criticized for this, I stand in good company. Great pioneers in the field of information theory, people like Weiner and Shannon, were harshly criticized for the "fuzziness" of their concepts. (See, for example, editorial in March, 1959 IEEE Transactions on
Information Theory.) However, information theory plays a vital role in present-day communications. Plainly, information theory would never have gotten off the ground if Mr. Butler's criteria had been applied. First comes the idea; first falls the apple on Mr. Newton's head. Then come the numbers. A lot of science is done in this way. Mr. Butler may be offended, but there it is. Here we have another version of the old chicken and egg controversy, and it is better not to be too dogmatic about which has to come first.

And what is this "accuracy" that Mr. Butler wants so badly? Surely he is not being totally literal. To accurately reproduce the acoustic power emitted by a full orchestra would be disastrous in the average listening room. Ear-drums and windows would be shattered. Even to reproduce an equivalent acoustical level might be hazardous to one's hearing in the long run—and yes, classical musicians, just like rock guitarists, develop hearing problems due to high sound levels. So immediately we must start making our inaccurate compromises. It is equally well-known that a drooping high-frequency response is necessary to make reproduced music bearable. Mr. Butler may choose to fry his ears in the name of high-frequency accuracy, assuming that accuracy means flat frequency response, but I choose a more *musically* accurate experience at the expense of *electronic* or *physical* accuracy. Once again, in the real world there are trade-offs, compromises, and subjective decisions that have to be made before you can actually start listening to recorded music. Numbers are not the whole answer. Even the most technically demanding listener adjusts the level control with subjective inaccuracy. Mr. Butler, do you set your volume control to the decibel with a sound-level meter? No? I rest my case.

*Herbert Highstone*

Oakland, CA

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**Belt...**

Editor:
The ability of audiophiles to hear things which do not exist seems to have reached new heights with the Peter Belt affair (Vol. 10 No. 9). Following so closely on Enid Lumley's audio gremlins and Judith Reilly's discovery of digitally induced spindle rot, it heralds a new age of self-delusion among hobbyists. While "Heidelberg magnetic batteries" to cure tuberculosis and impotence are no longer sold, it appears that there is still a market for $1250 "polarizers" to combat the malign effects of electromagnetic radiation. JGH rightly inveighs against the scientific illiteracy which permits such charlatanism to flourish, but it is distressing to read that so sensible and experienced an authority as Martin Colloms has succumbed to occult nonsense.

What is still more distressing is that the good guys are mired in ignorance too. Consider, for example, the letter from reader Charles Butler (Vol. 10 No. 9), an impassioned plea for the application of scientific method to the evaluation of wire and cable. Mr. Butler is clearly on the side of the angels. His letter is thoughtful and well-intentioned—and wrong in almost every particular. Yes, excess charge migrates to the outer surface of a conductor, but there is no excess charge in a wire, not even a current-carrying wire. The mobile electrons move amidst a sea of fixed positive charge due to the ion cores; the net volume charge is zero.

If he has been unable to find a discussion of the skin effect, he has not looked very hard; it is contained in every introductory textbook of electromagnetic field theory. Since the skin effect is a direct consequence of Maxwell's equations, its existence is no more "questionable" than the existence of, say, radio waves. Litz wire is distinguished from ordinary stranded wire by the fact that the strands are insulated from each other; it was invented precisely to minimize the skin effect. The skin effect is not due to "induction" except insofar as Faraday's law of induction was incorporated in Maxwell's equations 120 years ago, etc., etc. When the fruits of 19th-century science, which rank among the chief glories of our cultural heritage, are regarded as impenetrable arcana by those who pretend to technological sophistication, it is time to announce that the barbarians are at the gates.

I propose two remedies against this rising tide of knownothingism. The first is that those who wish to pursue audio technology to its source go to their local college and register for a course or two in physics or electrical engineering. They are unlikely to receive anything beyond the conventional wisdom, but the conventional wisdom has much to recommend it. First, there is a great deal of it, because it has been accumulating for several centuries. One might come away with a new apprecia-
B&W's Model 801 — the recording industry's Reference Standard Monitor — was the inspiration for innovation. Dramatic developments in technology and enclosure design have lit the fuse. B&W's Matrix 801 Series 2 personifies the state-of-the-art ten years on. This magnificent successor sets the new standard for professional and home user alike. With no commercial compromise. Rich in Matrix technology, 801 Series 2 registers accurately, even beyond audibility. Phenomenal sound. Clean and utterly uncoloured. Outstanding imagery with tight unbooming bass. An instrument destined to occupy a special place in world esteem.
tion for how much is already known. Second, it provides safeguards against foolish utterances. No aspect of high-end audio is more appalling to the initiated than the egregious technical errors which pollute its popular literature, eg, the repeated references to acoustic “waves” inside loudspeaker enclosures small compared with a wavelength. And third, it offers the surest cure for Pearson’s Syndrome and other intellectually transmitted diseases: the belief that objective measurements are worthless for the characterization of sound-reproduction equipment.

My second remedy, which I commend especially to those who imagine that the hallucinations of Belt, Lumley, and Reilly are exclusively a contemporary phenomenon, is to read the cautionary tale published in the biography of RW Wood. It tells of Wood’s merciless exposure of Professor Blondlot and N-rays, perhaps the most pathetic example of self-delusion in modern science. One need only substitute audible effects for visual to grasp its pertinence to the Belt affair. But it can be said of Blondlot, as it evidently cannot be said of the rapacious Belt, that he never sought material gain from his researches.

Edward A. Fagen
Newark, DE

...and demagnetizing braces

Editor:
For many years I have been working on an audio problem that appeared to have no solution. I wanted to know why a given audio system would sound wonderful at 3am and so poorly at 3pm. The answer and solution came about two weeks ago.

Yesterday, I received my first copy of Stereophile (Vol.10 No.9) and, to my amazement, some of what I discovered was presented in the Peter Belt article.

It would appear that an amplifier or pre-amplifier, etc., when in use, is constantly being bathed in an electromagnetic field. Turn off the power and a “residual” field will remain in place, radiating from anything metal (the case, parts, etc.). As times goes by, the “residual” field grows in strength and size, and its effect on the performance of the amplifier, especially during the day, is considerable. Every parameter of performance is affected.

The solution was an old 30W head demagnetizer made by Sony (model HE-2). I demagnetized the case inside and out, and all metal parts, including the transformer and output transistors, plus interconnecting cables and speaker wires. The effect of that has to be perceived to be believed. However, if a given system has its interconnecting cables and power wires entangled so as to create a kind of external integrated circuit, then I doubt there will be much improvement in performance.

Ron Paquette
Phoenix, AZ

Belt & belief systems

Editor:
After reading “The Belt Affair” in the December issue of Stereophile for the fourth time, I find myself feeling a little defensive and bewildered by some of J. Gordon Holt’s comments.

My heart’s desire would be to bring tears to his eyes by the powerful and eloquent use of logic and reason to present my personal convictions concerning the existence of God and His revelation of Himself to us. Inspection of my thorough knowledge of grammar and my mastery of the English language (Hal), however, would quickly convince both of us that to accomplish this would truly take a miracle!

I certainly don’t want to get nasty or offensive in my response, but it seems that, in my opinion, many of the conclusions JGH comes to concerning science, miracles, and belief in general are not any different from mine. He fabricates an explanation for something happening the way it does, then offers it as fact without reasons to verify it; this is ethically questionable. Don’t you think that the scientific community is guilty of this concerning evolution?

It takes a lot of faith to believe in evolution.

He also said, in so many words, that we perceive what we want to unless there is an anchor in scientific data. But you can interpret that data with just enough desire (bias) necessary to come to the conclusion you want.

He also said that he didn’t believe in miracles. That sounds pretty closed-minded to me.

As basically as I can put it, I believe that there are people in the world with just as much intelligence, reasoning ability, and commitment to the integrity of scientific evaluation as you have who have come to a different conclusion about the existence of God, etc.

In the context of J. Gordon Holt’s editorial, I came away feeling he was saying that I was
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High performance. Down to earth.
unintelligent, ignorant, biased, or all of the above. I don't think it was necessary for him to say that in order for me to interpret that he can't hear any improvement using the Belt "things."

Thank you, however, for his commitment to audio and all the people served by Stereophile.

Alan Pugmire
Tujunga, CA

Belt & suggestibility

Editor:
With the coming of Beltism to Stereophile (Vol.10 No.9), its readers face a serious dilemma.

If they accept the contention of Founder and Chief Tester J. Gordon Holt, then they must characterize Editor John Atkinson and Contributing Editors Martin Colloms and Alvin Gold as being severely affected by subjective influences ("suggestible," to use Holt's word) with regard to their music listening.

On the other hand, if they believe Atkinson, Colloms, and Gold, then your readers must attribute musical deafness to Holt.

Either alternative casts doubt on the listening reliability exhibited by key members of Stereophile's editorial staff.

Edison Price
Edison Price Incorporated
New York, NY

Well, yes, it would be neater all round if we omitted embarrassing facts so as to publish an apparent editorial consensus. But as such tailoring of the evidence makes me feel uncomfortable—reporting should be accurate—I'll publish everything relevant to the issue even if, as was the case with the Belt Affair, there appear to be internal inconsistencies. MC and AG heard differences in their own systems; though JGH didn't bear a difference in Keith Howard's presentation at the Penta Show, I thought I did—that at least is what happened. And as to which of us, if any, was right—probably JGH—the passage of time should reveal the answer.

Mike Hunter
Virginia Beach, VA

If this is not a put-on, it sounds like you're a bit obsessed—which is neither pleasant nor particularly healthy. My guess is that with most people it goes away with time, but if this doesn't work I think you should seek professional help. If your lack of sleep interferes with your other activities—I assume there are some!—then sleeping pills may help, but if you continue to need them, that's another reason to seek professional help.

The sensible solution

Editor:
I read with no little amusement the current debate running in Stereophile regarding solid-core speaker cable. Without demeaning the validity of these observations, I shall add that in England a similar period of polarization occurred two to three years ago. The fuss surrounding this has all but died, and people just use that which they are most comfortable with. Surely this is the most sensible solution: use whatever cable you prefer, and just smile sweetly when people try to convert you. Personally I have tried a good few cables, both multistrand and solid-core, even some solid-
core cooker hookup cable which should make Brisson seem like well-cooked spaghetti, and I presently use very thin solid-core cable suspended from the ceiling spaced parallel at 3" in thin polythene sheets. I like this, and there is no loss of bass, nor alteration of frequency response. Enjoy the controversy, but don't let it drag on for too long; music's what it's all about, isn't it?

Robert Wilson
Houghton-le-Spring, Tyne and Wear, England

Stromeyer & Greenspun respond
Editor:
Our intent in reporting on our comparative evaluation of the Graham and ET tonearms in Vol.10 No.8 (November 1987) was to bring to the attention of other audiophiles a blind testing technique that we feel is superior to the traditional non-blind methods used by consumers and reviewers alike. We reported the results of our test only to illustrate that a blind test of this type need not lead to statistically insignificant preference data. It was not our intent to encourage people to buy one or the other tonearm.

Mr. Price is correct in his letter published in Vol.11 No.2 in pointing out that we should have invited Mr. Thigpen up from Florida to the listening test. Mr. Graham lives 15 miles from Greenspun's house and we invited him over at the last minute. We do not understand how personal contact with either designer could have biased the listeners (since the test was blind), but for what it's worth, Greenspun met Mr. Thigpen at a Consumer Electronics Show. Neither individual would have been able to assist in the setting up of the tonearms because the tape was made several weeks before the listening test.

We adjusted the azimuth carefully with both tonearms, and were thus well aware of the ET's azimuth adjustment and mechanism. Our comment that "the [ET's] bearing does not allow rotation of the cartridge in the azimuthal plane" was meant to reassure readers that the azimuth does not vary during play; we apologize if this comment confused some readers.

To answer Mr. Price's questions about setup, we would like to note that we did indeed read ET's installation manual and, as stated in the article, Stromeyer mounted both tonearms.

Regarding Mr. Price's question: "Why was this article—which, when submitted to another audio publication, was returned twice for rewriting and still deemed unacceptable—even published at all?", The Absolute Sound did not return the article even once. However, Harry Pearson did reject it for publication in TAS because he thought some readers would confuse our article with a review of the limited-availability Graham arm. Happily, Stereophile's primary interest coincided with ours: tonearm testing methodology.

We did not want to take up a lot of space in Stereophile with our raw data, especially since no reasonable interpretation of the data would have resulted in a null conclusion or "victory" for the ET arm. Mr. Hammond's backward dissection of our point scores in his letter in Vol.11 No.2 was unnecessary. He must have missed the sentence "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." These data are unweighted.

As we noted in the article, we included Mr. Graham's data because he had no experience with the loudspeakers, tape recorder, amplifier, or recordings that we used. Excluding his data would not have changed any of our conclusions. If Mr. Hammond is interested in seeing data combed for barely significant preferences, we direct him to a blind cable test report by Greenspun and Leigh Kloitz, Jr. in the winter 1987 Computer Music Journal.

All the other criticisms in both letters are anticipated in the original article and our thoughts have not changed on these points. We are grateful to Messrs. Price and Hammond for giving us this opportunity to clarify the above issues.

Philip Greenspun
Charles F. Stromeyer III
Cambridge, MA

Blind faith #1
Editor:
In your November issue John Atkinson states that "proving anything from blind testing is extremely hard—which is why Stereophile does not test equipment in this manner." I wonder if Mr. Atkinson bothered to read the blind tonearm test by Stromeyer and Greenspun in the same issue. They noted that "the fact that a test is not blind engenders a risk that prejudices will affect the test results" and that "careful blind subjective tests are valuable." I
believe this is true, and I wish Stereophile would subject all products to some form of blind testing. I find blind testing quite revealing.

Of course, lately you have been doing rather poorly in blind tests. The situation with the SP9 was nothing short of a fiasco. JGH confused the sound of the SP9 with the sound of the highly acclaimed SP11 100% of the time. You argue that this result is statistically significant between the preamplifiers. But this argument proves too much. Do you seriously expect me to believe that you were purposefully identifying the best-sounding preamplifier as the SP9...after two of your reviewers had blasted it from one side of the planet to the other?

My rule for purchasing audio equipment is: "If I can’t hear the difference, I won’t pay the difference." The rule is a bit trite, but I try not to forget that sound quality (not prestige or ego) is what audio equipment is all about. I know my own psychology well enough to realize that what I think I hear can be influenced by the brand name, price, or appearance of a component. That is why I do all of my comparative listening under blind conditions. I would have more faith in your reviewers’ adjectives if they did the same.

John Walter
Durham, NC

Blind faith #2
Editor:
I was exceedingly amused by your review/postscript of the Audio Research SP9 preamplifier (Vol.10 No.8). You must be commended for your honesty and candor. More specifically, your blind test suggested that, at best, the SP9 ($1700) was sonically indistinguishable from the SP11 ($5000). Even if we admit that the SP11 is a better preamp, are there questionable infinitesimal differences worth $3300? Of course, this is a matter for the rich ears spending the money to decide.

On the subject of blind testing, I suggest that you do this routinely with every product you evaluate. It would be a bold step that would lend so much more credence and objectivity to such evaluations. Furthermore, it would put Julian Hirsch and Stereo Review to rest. Wouldn’t it?

Finally, I find it absolutely necessary to read audiophile publications very critically. When Stereophile and The Absolute Sound praise reasonably priced equipment—for example the Adcom GFP-555 ($500)—it then becomes worthwhile to audition this product. Thank you for the Cheapskate.

Ronald Ambrose
Pittsburgh, PA

Don Scott & the Marantz 10B
Editor:
To judge by his letter on p.29 of the December issue of Stereophile, Mr. Bongiorno has not read my original review of the Marantz 10B tuner (Vol.10 No.4) correctly. Of the five footnotes at the bottom of p.141, #1 and #4 refer to modifications of the Marantz 10B. It is clearly indicated that other modifications are for Scott, Luxman, and Mac tuners.

I wish to address briefly the footnotes and modifications related to the 10B:

In the original circuit the respective grid of a 12AX7 for each channel is connected directly to the center arm of a level control. This, in my opinion, is poor design because grid loading and bias are varied with level settings. By adding a small amount of negative feedback and DC from the cathode to the grid, I found an exact point between 80-100% rotation of each channel pot where grid matching impedance and bias were optimum and resulted in very low distortion. This scheme also allows precise matching for individual tubes and provides lower TIM than inserting an additional blocking capacitor and a fixed grid resistor to ground. Granted the level-change function is limited, but the pots are usually found at or near full rotation anyway. In comparing this modification with two unmodified units, the modified unit produced more of the 10B’s natural silkiness, with greater detail on brushes and similar delicate sounds. The other modifications mentioned in footnote 1 added further improvement, but are subject to individual unit power-supply voltages, tube characteristics, and the average tonal balance of the stations received.

Footnote 4, suggesting a method of increasing SCA rejection, does not correlate with technical incompetence. Many metro stations now carry data on their SCs. This is far nastier to remove than usual background music. The more SCA rejection the better; although birdies may not be heard, high-frequency intermodulation is present that puts a grating veil over the desired program.
The McIntosh XRT 22 is the purest expression of the loudspeakers scientist's endeavors. It is the one right combination of component parts that has eluded the diligent searcher for the loudspeaker bridge to the dominion of reproduced musical reality. The high-frequency radiator column is an illustration of the right combination. The 23 tweeter elements can reproduce 300 watts sine wave input power at 20 kHz, with the lowest measured intermodulation distortion. Because each tweeter mechanism handles a small quantity of the total power, extremely low quantities of distortion are developed. The total column radiates the energy in a half cylindrical time co-ordinated sound field. The low distortion, transparency of sound, coherence of sound images, definition of musical instruments, and musical balance is simply a revelation that you must experience.

Handcrafted with pride in the United States by dedicated, highly trained craftspeople.
At Stereophile's NY High End Show, I had a lengthy discussion with D. Klmo concerning the importance of extensive filtering in the Ertaanax tuner to be sold in the US market. Actually, the matter of SCJA rejection is becoming more important because FCC regulations allow the use of two SCAs. As this practice becomes more prominent, additional filtering for other than 67kHz interference will be needed. Phase-locked loop cancellation filters, as used in the latest NEC T-710 tuner, will probably be the technical route chosen for eradication.

And yes, I did have the circuit diagram. This made it easier to translate what I felt to be design flaws into audible improvements. All three 10Bs tested were in mint condition and were not butchered. Don A. Scott Middletown, CT

NYAL questions
Editor:
The December 1987 issue of Stereophile has a letter to the Editor on page 25, signed by Robert Clark, that concerns itself with certain products manufactured by NY Audio Labs (Harvey Rosenberg). I, too, have had problems with the OTL-1 amps, and have had no success in having them repaired by NY Audio Labs. Richard L. Kriss Glen Head, NY

NYAL answers
Editor:
I was surprised that Robert Clark's letter (Vol.10 No.9) questioning my ethics was not submitted to me before it was printed, as his accusations are inaccurate and simpleminded. To wit:

1) His account of my relationship with Tube God is false. I had two partners in Tube God who abandoned ship, leaving me with the company. Tube God did not leave anyone in the lurch, and I continued to service those products.

2) While his assertion that New York Audio Labs is out of business is correct, he is wrong in stating that I have left my customers without proper servicing. The service work is being handled by Ted Hammond, who can be reached at (914) 736-0698. He also has a complete parts inventory. Clark would have discovered this by calling me.

3) I never offered to sell anyone a Futterman schematic for $50, and NYAL did not advertise in Audiomart. Clark is simpleminded to think that I would spend a small fortune in developing a unique form of technology and then offer this work for $50 to anyone who wanted it. My standard response to the hundreds of audio nerds who call me requesting a free copy of schematics of Futterman amplifiers is: for $50,000 (not $50), I will be glad to send a copy.

4) Clark is absolutely misinformed if he believes that Hybrit has ever received a review of any product in any audio publication.

As an accomplished swordsman and pistol dueler I regret that we are not living in a more glorious time when I could defend my honor and challenge Mr. Clark. He deserves nothing more than the mark of Zorro carved in his chest.

Mr. Clark: Why not let God decide who is right and accept my challenge? I would be glad to meet you at dawn in Central Park. Pistols or Swords? Bring your second. For writing such a slanderous letter I also suggest that the editors of Stereophile cancel your subscription and you be banished from Audophileville and be chained to a $499 Marantz rack system that plays heavy-metal rock until you are prepared to temper your opinions with facts. Harvey Rosenberg New York, NY

We called Mr. Hammond and were given the following information: for work under warranty, a flat fee of $60 covers Minuets and Moscode 300s and 600s; $25 covers Superlts; usually, there is no parts charge. OTLs were not mentioned. The procedure is for the owner of an NYAL product to call Mr. Hammond, who then quotes a price. If this is acceptable, he or she sends the unit to Mr. Hammond, who will call back when the work is done. The unit will be returned upon receipt of the money.

—JA

Clipped cannons
Editor:
I have found an anomaly on a compact disc that your readers might find interesting. The disc is the Telarc version of the 1812 Overture (Digital Cannons, etc.).

I was fooling around with an oscilloscope, checking out what the cannon-shot waveforms look like at the output from my Magnavox CDB-560 CD player. I noticed that a
Technology Perfected.

Every home audio component company has its 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, as Luxman was originally named, was established in 1925 to design and manufacture high quality radio tuners for a budding 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 have continued to design and develop the internal parts for 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 contributed to the sonic superiority of the SQ-518: the industry reference standard for integrated amplifiers.

**The transistor revolution.**

In the mid-60’s transistor technology revolutionized the audio industry, and virtually every audio component could now benefit from the increased efficiency, cost economy and higher power output of transistors compared to vacuum tubes. To audio enthusiasts, however, this new technology clearly lost the warm, sonic purity of tube components.

The long and detailed study of transformers and tube configurations enabled Lux to design transistor components that retained true “musicality”.

Then in 1975, Lux adopted the family name of Luxman and, with their debut at the Consumer Electronics Show in the United States, received immediate critical acclaim for design and performance.

The continued development of innovative circuit designs, such as DC amplification (1975), Duo-Beta circuitry (1980) and Computer Analyzed Tuning (1982), were examples of technology perfected for performance.

Luxman’s reputation was rapidly spreading: transistor amplifiers with the warm, musical sound of previous tube designs.

**The tradition continues.**

Maintaining that “tube-like” musicality while using today’s technology has become Luxman’s forte. In 1985, Luxman introduced the world’s first hybrid integrated amplifier: BR1D. . . a unique combination of tubes and FET’s that epitomizes the musicality of live performances.

Internationally recognized as a sonic milestone for moderately priced amplifiers, this “BR1D” 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.

Luxman
Division of Alpine Electronics of America, Inc.
(213) 677-1801
few of the extreme peaks on the shots were rounded or flattened. I assumed that this was due to careful digital editing in the CD mastering process, as the "flattening" occurred just below the maximum possible CD output level (checked with the Denon test CD). Just to make sure that my player wasn't somehow clipping, supposedly impossible in the CD system, I checked the output from my brother's Technics CD player—the same peaks were flattened.

Now comes the interesting part—we also checked my brother's copy of the same CD (mine is mastered by CBS/Sony, his by Matsushita). Most of the cannon-shot peaks on his version were extremely flattened, looking like hard clipping of an amplifier. The same effect was seen on both players. Although the absolute level of most of the music was the same from both CDs, the cannon shots from the Matsushita version sounded obviously muffled and much less distinct.

How can this be so in the standardized CD system? How can two CDs made from supposedly identical digital master tapes be so different? Is the problem sloppy CD mastering? Does Telarc (or Jack Renner) know about this? Thanks for publishing a great magazine!

K. Beers, Jr.
Tremont City, OH

A pleasure
Editor:
First, your readers might like to know that it's a pleasure doing business with Conrad-Johnson. I called them recently to ask about having my PV-2 preamp upgraded. The friendly man who answered the phone took about 30 seconds to find my file and remind me that I'd bought the unit seven years ago and returned it once five years ago, at which time they replaced (under the warranty, as I recall) a tube and a fuse that the tube took with it. The price he quoted for the upgrade was quite reasonable, and he said it would take seven to ten working days to do it.

After allowing for shipping time, I reckon they sent it back on the ninth working day after they got it. While they were at it, they replaced a malfunctioning muting relay at no charge. It sounds better than 95% of all preamps invented yesterday, and if I get another seven years out of it, it's the bargain of the century. Based on my experience, you can buy Conrad-Johnson products with complete confidence.

Second, your reviewers who said that the Ortofon X3-MC is a good cartridge were absolutely right. However, I think you might reemphasize that it needs to be broken in. When I first installed mine, I forgot that you had mentioned that, and I thought I'd really been taken to the cleaners by the wily Danes. Part of the bass boomed horribly, and the rest had barely the strength to make it from the speakers to my ear trumpet; sibilants sent Fido scurrying for the doggy door. But the longer I use it, the better it sounds, and it's sounding lovely.

Ken Craven
Morristown, NJ

Buffalo Audio Society
Editor:
I am writing to you on behalf of our Audio Society in the Buffalo, NY area.

The reason for this letter is to let publications such as Stereophile know that Audio Societies such as ours exist and are interested in every facet of audio. We have been in existence for three years now and have made great progress in membership and in aiding individuals who may have purchased a no-name rack/component system without knowing what quality components could have been bought. We have had some of the best manufacturers of audio components address our club and we will continue on this basis.

I remember seeing, in one of the "other" audio publications, a listing of known Audio Societies throughout the US and Canada. This was four or five years ago. The listing gave the name of the society, address, person to contact, and phone number (if available). Would Stereophile consider doing something like this in the future, and then possibly publish it every year in one of your issues?

Oh, by the way, anyone interested in joining our society can do so by writing to us at WNY Audio Society, PO Box 312, North Tonwanda, NY 14120.

Michael A. Monaco
Vice President, WNY Audio Society
Yes, we would like to publish such information in Stereophile. Would any audio societies out there that would care to be mentioned in such a list write me with full membership details, lists of their objectives, and, if available, recent copies of their newsletters?—JA
Audio on satellite?
Editor: How about an article on audio programs on satellite? What dish and equipment are necessary? Quality? I know WFMT is up there. Who else? There is no NPR station here. Incidentally, the last several issues of *Stereophile* have been great!

Bob Perl
Lubbock, TX

The Yamaha DSP-1 again
Editor: Intrigued by Bill Sommerwerck's review in Vol.10 No.4, I bought a Yamaha DSP-1 ambiance synthesizer. I am excited about the ultimate outcome, but it has been difficult to elicit outstanding results; my experiences may be of value to other readers.

I first connected the synthesizer after the preamp, with main and effect power amps connected to the outputs on the synthesizer. I made the initial adjustments, muted the effect speakers with the handy button on the remote control, and was amazed at the lifelessness of the sound. As I got the synthesizer better adjusted, the difference widened; I couldn't believe that my system had sounded so bad. It turns out it hadn't; the synthesizer greatly degrades the main speaker sound.

Sommerwerck must have connected his main-speaker amplifiers to his preamp output, otherwise the paragraph (at the top of p.129)
about Radio Shack Y-cables makes no sense. But Sommerwerck's advice shouldn't be in code: readers, don't use the DSP-1 main-speaker outputs; they screw up the sound. This means you have to go with six speakers right from the beginning, since the four-speaker setup requires that you drive the main speakers from the synthesizer.

After wiring the main-speaker signals around the synthesizer, I then needed to deal with signal levels. Wired into the system after the preamp, the DSP-1 sees tiny signals when you're listening to chamber music after midnight, and sizable ones when you're impressing your friends with orchestral theatricals. Although the DSP-1 has a wider dynamic range than any similar product in my experience, it still produces noisy and distorted (quantizing and underflow-induced) signals at low levels, and distorts (clipping and overflow-induced) at high levels. Yamaha fails to discuss either problem in their manuals, but they do make a component to correct the situation: the MVS-1, a passive 6-way attenuator packaged with some switching circuitry and priced at $150. I didn't use the switching portion, but connected the attenuator between the preamp and the main power amps and between the effect outputs and the effect amplifiers. This gives a single level control for all six speakers (performing the same function as the level control of the preamp), but the important contribution of this setup is to control the level the DSP-1 sees separately from the volume at the speakers. Now you can run the synthesizer in the optimum range during quiet reveries and sonic spectacles, with the attenuator set at 30dB (it's calibrated) for the former and 0dB for the latter. Now the quiet music is free of sizzling and twanging, and the orchestra doesn't overload on peaks.

But what does the MVS-1 do to the main speaker sound? It's not perfect, but it's not bad—nowhere near the havoc wreaked by the DSP-1. Fanatics—I include myself in this class—will probably eventually want to wire up a 6-way attenuator with switched attenuation of 0, 10, 20, and 30dB. Note that you don't need continuous attenuation here; just set it for the rough level desired, and use the preamp for the fine adjustments.

Sommerwerck apparently fed the main speaker amplifiers with the same signal he fed to the synthesizer. With my system this gives the synthesizer too small a signal, forcing me to adjust the effect level to less than 50% using the digital attenuator in the DSP-1, with consequent loss of dynamic range. (A digital attenuator such as the one in the DSP-1 doesn't attenuate the noise and distortion as it lowers the signal level; the MVS-1 is an analog attenuator and affects both equally.) Yamaha recommends 10dB of attenuation between the preamp and the main speaker amplifiers; the DSP-1 includes a switch to obtain such attenuation, but to use it, you must connect your main speaker amps to the DSP-1 and suffer the audible effects. In my system, 0dB is enough attenuation; I obtained it with two 10k metal-film resistors per side.

Is all this worth it? On most orchestral and chamber music, some jazz, and choral music without a soloist, the effect is dramatic, and I would have a very hard time going back to ordinary stereo.

James M. Kasson
Santa Clara, CA

Why no Levinson?

Editor:
I am a new subscriber and enjoy Stereophile very much. In particular, I look forward to gaining more perspective on the relative merits of tubes and transistors in sound reproduction.

It was with great interest that I read "Recommended Components" in the November 1987 issue. I am familiar with and have listened to a number of the recommended preamps, power amps, and speakers (C-J, Audio Research, Krell, Threshold, Apogee, and Magnepan), and find them all to be excellent pieces of equipment. However, I was somewhat puzzled to find that one brand was conspicuously absent (except for one K rating): Mark Levinson. As an owner of an ML 7 preamp and an ML 9 power amp, I have two questions:

1) Why are no Mark Levinson components currently recommended by Stereophile?

2) How do the editors of Stereophile rate Mark Levinson components relative to the recommended components?

W. W. Montgomery
Midland, TX

Reviews of current Mark Levinson components from Madrigal are in the works at present, though the results will probably not be in time to be incorporated in the next "Recommended Components," due to appear next month.

—JA
THE ELITE M-90 AND C-90 REFERENCE COMPONENTS

Hum, hiss, crosstalk, vibration: distortion in your audio signal.
Graininess, specks, flecks, jitter: extraneous noise in your video image.
Garbage.
The Elite C-90 pre-amp and M-90 power amp are no-compromise components designed to get rid of it. By keeping critical signal paths as short as possible. By offering you direct CD connection. By introducing motorized volume control, separate audio and video power transformers, and unique video processing controls like noise reduction, sharpness and detail. By giving you the purest possible audio and video that digital technology has to offer.

In the words of audio critic Julian Hirsch in Stereo Review, “The C-90’s signal to noise ratio is considerably better than that of any CD player...that makes the C-90 the true peer of any digital sound source—the only pre-amplifier we have tested that can make that claim.”
The C-90 also cleans up your video. Because it not only controls up to six

*Measured by EIA method. "Based on FTC rules regarding measurement of amplifier power ratings."
video components, its video-enhancing circuits actually improve your video image. Now, even rented videotapes take on a whole new look.

But what good is a complete A/V system without remote capabilities? The C-90’s “SR System Remote gives you complete control, plus a unique Motor-Drive Volume Control that eliminates the noise created by typical electronic volume controls.

Where the C-90 leaves off, the M-90 takes over. With 800 watts/channel into 2 ohm loads; 200 watts into 8 ohms; and remarkably high current capability (47 amps) for low impedance driving, the M-90 delivers the kind of performance digital signals demand. And for unprecedented purity, the M-90 even includes its own volume control for direct connection to your CD player.

The Elite M-90 and C-90 working together. There’s just no better way to take out the garbage.

For more information, call 1-800-421-1404.
USA: Peter W. Mitchell

At a Winter CES panel discussion entitled "Will Congress Kill DAT?" the consensus was that the fight will be close, but the bill to require Copycode scanners in DAT recorders will not pass. Aside from its specific pros and cons, the anti-DAT bill would put limits on a new technology, and according to Rep. Joe Barton of Texas, that is a precedent that Congress would be reluctant to set.

The panel, which consisted of Barton, Rep. Robert Kastenmeier of Wisconsin, and Register of Copyrights Ralph Oman, expressed the wish that the DAT controversy might be resolved by compromise. Two possible compromises were mentioned. One was a royalty tax on blank DAT tape. The other was the Philips one-copy system, an idea that has been spreading and gathering informal support but has not been officially endorsed by anyone, not even by Philips.

The one-copy scheme has a curious history. It was proposed last spring by Peter Plompen, an executive at the giant Philips research lab in Eindhoven, Holland, speaking at a European Economic Community copyright seminar in London. But the bureaucrats at Philips have refused to support the proposal or even to make its text available. The idea became public knowledge because people who attended the seminar talked about it, and the story was picked up by British writers, notably by Barry Fox in the pro-audio magazine Studio Sound.

The one-copy proposal begins by recogniz-
ing why record companies are panicked by DAT. As I explained in this space last month, the worry is that once a recording is copied onto DAT, it can be endlessly cloned by digital copying with virtually no loss of quality. Compromises adopted in DAT design to obstruct digital copying of CDs (via copy-flag sensing and incompatible sampling rates) didn’t solve the problem. A DAT could make a near-exact copy of a CD through its analog inputs, and each DAT tape could then serve as the source of an unlimited number of digital copies. As a practical matter, the first two levels of copy-protection might as well not exist; to prevent the use of DAT for digital cloning, the record companies believe they need to block copying through the DAT’s analog inputs as well. Copycode is the magic bullet that addresses this need.

The Philips one-copy scheme is a simple alternative that obstructs digital piracy while eliminating any need for notch-filtered records. The proposal can be summed up in one simple idea: make every consumer-grade DAT recorder put a copy-protect flag into its own recordings. Then a DAT could freely record from any source, analog or digital, but DAT tapes could not be digitally cloned. You could copy a CD onto DAT tape, but you could not dub that tape digitally onto a second DAT.

Consumers would retain their present freedom under copyright law to copy recordings for personal use. You could copy any recording from any source onto DAT tape for any legitimate reason—e.g., to collect favorite selections, or for car playback. You could record broadcasts for later playback, and you could give a DAT tape to a friend to introduce him to an artist or composition. Without the unreliability imposed by Copycode scanners, you could use a DAT to record live music, or even start your own record company. (Some conspiracy buffs think this is why record companies are afraid of DAT, but I don’t believe it.)

In sum, under the Philips one-copy system, DAT recorders would be what tape recorders have always been, but with better fidelity. Consumers would retain their historical freedom to make their own recordings from any source, while the digital dubbing that worries record companies would be blocked. Instead of lobbying governments, punishing consumers, and notch-filtering our musical heritage, record companies could concentrate their anti-piracy efforts on enforcing existing laws against the large-scale commercial pirates who cause real economic harm. Bypassing a DAT recorder’s copy-flag protection would be illegal, and pirated tapes would be easy to identify since any DAT tape without a copy-protect flag would be illegal and could be confiscated.

The one-copy scheme is not ideal, since it would banish digital tape editing and digital tape-to-tape dubbing from the consumer domain, thereby crippling one attractive feature of the DAT. Amateur recordists would have to edit and copy their tapes in analog form, or invest in a professional DAT machine.

But one-copy is a vastly better proposal than the whole crazy Copycode system. Keep in mind that the DAT has already been crippled for the sake of copy-protection, by making it sensitive to CD copy flags and by locking it out of recording at CD’s sampling rate. I’ll bet that if given a choice, most listeners would willingly sacrifice the ability to make multi-generational digital tape dubs in favor of restoring the ability to dub favorite CDs digitally onto tape for on-the-go listening.

Congress isn’t actually considering the one-copy idea, of course, since nobody has endorsed it or written it up as a proposed bill. If the Copycode bill threatens to become law, the one-copy scheme will have to be actively proposed as a substitute. At present, however, the best guess is that Copycode will fall of its own weight.

Last spring, when there was strong pressure from anti-DAT forces pushing Congress to adopt Copycode, our legislators defused the situation by passing the buck to the National Bureau of Standards, requesting a determination of whether Copycode degrades the sound of music. It was a clever way of postponing a decision, but the NBS report (due to be published before this issue reaches you) is not likely either to endorse or to condemn Copycoding. A blanket condemnation is virtually out of the question, since the filter’s effect is not always obvious: the notch alters only a few notes of the spectrum and can be switched in and out during mastering to minimize its sonic damage. The NBS report probably will say that the Copycode notch is audible to some people, in some music, some of the time—an inconclusive result that will leave Congress back where it started.

The CES panelists agreed that the DAT/Copy-
audible results with the finest in connecting components.
code issue will come to a head sometime this year, especially if manufacturers bring recorders to market (which the panel members, all pro-DAT, seemed to favor). But Japanese manufacturers were made very nervous by last spring's trade sanctions and the Toshiba-bashing in Congress last summer, and many remain afraid to export digital recorders to the US until the threat of Congressional retribution is settled. At the June '87 CES, Marantz and Harman/Kardon tried to break up this stalemate by promising to launch DAT recorders in the US by October 1987 and early 1988 respectively; but their Japanese suppliers refused to deliver. Back in 1986 the anti-DAT campaign was treated as a copyright issue, but in 1987 it became part of a broadly anti-Japanese, decidedly protectionist trade bill. That bill was shelved last fall, but who can say what spark might revive it in 1988? DAT recorders are likely to remain hostage to this uncertainty for a few more months.

The impasse was only partly broken by Ford's pre-Christmas announcement that a DAT player will be available as a $2000 option in Lincoln automobiles beginning in May. Other car DAT players were announced at the Winter CES by Clarion, Sanyo, and Kenwood, the latter promising delivery in February, and several dozen prerecorded DAT titles will be available from small labels such as Capriccio, Delta, GRP, Music Masters, and DMP, at retail prices in the $25 range. This play-only wedge will get DAT into the US market without threatening the record companies, and it may provide some incentive for major US labels to start producing their own DAT tapes for sale.

Incidentally, the phrase "US labels" reminds me that the RIAA's anti-DAT campaign has been based in part on the faintly racist notion that "foreign" (Oriental) equipment manufacturers are threatening the economic security of the "American" record industry. Since Capitol is part of English EMI, CBS Records belongs to Japanese Sony and RCA Records to West German Bertelsmann AG, that claim now sounds a little odd. The WEA group (Warner-Electra-Asylum) is the only large record company that is still US-owned. Of course, for those of us who care mainly about classical music, that distinction means nothing. Most classical recording, even that featuring American orchestras and artists, is done by Europeans and by relatively small, independent US labels such as Telarc and Delos.

Over a dozen DAT recorders were shown at CES, but none was accompanied by a firm delivery date. Tentative price tags were clustered around $2000, with one major exception: an astoundingly tiny (palm-size) Casio portable DAT recorder, that weighs only 1.6 pounds without battery and promises to sell for just $1099 list. The price looked like a misprint, and a friend just back from Japan thought he had seen the Casio DAT selling for around $2000 in Tokyo stores; but according to a Japanese colleague, its cost in Japan is 130,000 yen, or just over $1000 at the current exchange rate. At that price it's sure to be popular if and when it becomes available, though some sacrifices were made to keep it small: it uses only stereo mini-jacks for input and output, has no digital connections, and uses a single knob for setting recording levels with no means of adjusting input balance.

Next month in this space I will resume the discussion of digital filters that I began in an earlier issue.

**UK: Ken Kessler**

Optimism isn't my stock in trade, but I'm getting the impression that the high-end market in the UK is set for a boom period. Bear with me through some brief background, just so you'll know why I'm looking forward to this change in attitude.

The high end, as Americans know it, has only been a part of the UK scene for eight or ten years. Those of you who read the British magazines probably get the impression that esoteric gear must be selling by the 40-foot container load in Great Britain, but this just isn't the case. The reality is that high-end products have a disproportionate amount of exposure in the UK—relative to actual sales—for the simple reason that the British press is among the most vibrant in the world, and is as fascinated with the rare stuff as with the austere products which have been the UK's staple diet for a generation or two. In real terms, though, there is much resistance to the high end because the British traditionally loathe the conspicuous consumption, and because most of the serious esoterica is made by "foreigners." Fortunately, many are starting to realize that a lot of the expensive stuff delivers what is promised, and consumers are slowly but surely accepting the concept. In a country where, paradoxically,
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nobody disputes the purchase of cars costing more than houses, it's been a struggle to prove that other commodities also deserve to exist. While British magazines will never stop receiving readers' letters along the lines of "How dare you review something I can't afford?", they do now get an increasing number of letters which support the coverage of leading-edge technology, and that's the tip of a refreshing iceberg.

The trend which gives me hope, though, is not just the lessening of the small-minded, gee-poverty-is-grand attitude which the British have adopted as the excuse for failure since WW II. What is exciting is the growth of a type of market which barely existed in the UK even six months ago, but one which is already very much a part of the American scene. The latter days of 1987 saw Great Britain experiencing the emergence of a strong "installation market," and I don't mean dealers who simply deliver and set up the products they sell. After all, British retailers have long been leaders in this area, and are known for action above and beyond the call of duty. I'm speaking of consultancy-type operations, in which the retailer acts as an advisor along the lines of an architect or interior designer, selling not only the equipment but incorporating it into a "lifestyle." Where this differs from the practice of straightforward delivery, unpacking, and hooking-up is in its concern for attention to detail beyond sonic matters.

If hiding speaker cables, running remote speakers, and accounting for aesthetics sounds like pretty thin ground for anticipating growth in the high end, keep in mind that these are exactly the things about hi-fi which repel non-hobbyists. While I am sure that most Stereophile readers are fully prepared to put up with cables the diameter of a salami and electronics which take up more space than a coffee table, many consumers who can afford high-end don't buy the stuff because they don't want their living rooms turned into dedicated music rooms. This new breed of installer/dealer doesn't presuppose that every customer is a magazine-reading fanatic unconcerned with preserving some semblance of domestic normalcy; this dealer will expose high-end component systems to a whole new type of buyer.

The new installers include some very familiar high-end dealers with business sense, as well as some brand-new shops more interested in the contents of Architectural Digest or Interiors than the hi-fi press. Sure, they're more than happy to sell mid-fi remote-control systems from Japan and Denmark, but they're also expanding their catalogs with products new to the UK which offer style and convenience as well as serious performance. Brands like Metinor and Primare, with full remote control not offered as an option but fundamental to the components' performance, have finally reached Great Britain, and new systems or especially preamplifiers from companies like Counterpoint, Linn, Naim, and Revox have shown a willingness rare among known "performance" makes to adapt to new types of consumers.

If there's a fly in the ointment, it will be the purist reviewer who insists that the only garb for the music lover is the hair shirt and dark glasses. Plenty of customers do want remote-control facility and products which won't look out of place in a room stylishly furnished and decorated. Whether or not intimidation from the all-too-common British audio masochist will harm the growth of user-friendly, attractive hi-fi equipment remains to be seen, but few are worrying. The naysayers will be preaching to the converted, because they've already alienated the customer who wants to have a system long on facilities and short on ugliness. The naysayers will consist of both reviewers and retailers; the former will look like crusaders to some and misguided martyrs to others, while the latter will simply lose potential sales. Meanwhile, the installer/dealer will be doing more to get real hi-fi into more homes than any other force in audio.

Other clues reinforce my confidence. Haymarket Publishing, publishers of three "traditional" hi-fi magazines, recently launched a glossy magazine called Home Entertainment Design; it's full both of expensive product and of affordable gear presented in an atmosphere befitting a decorator's monthly, unashamedly ignoring the hobbyist while directly addressing a majority which the hi-fi community has long overlooked. On the hardware side, KEF (who, it must be admitted, have a strong presence in the already-converted USA) recently launched a line of products which previously would have been unthinkable for a British manufacturer. At the January CES, KEF displayed a range of speakers with true hi-fi specifications intended to be flush-mounted in
walls, the answer to a decorator’s dreams and a wholesale violation of the unwritten rules of audiophilia. Prior to this, the only flush mounts on the UK market came from American sources, such as Boston Acoustics, JBL, and Bose, and I believe that most of their sales have been in the commercial sector (bars, hotels, etc.). To complete the birth cycle, American company Audio Access appointed a UK distributor for their line of dedicated, professionally fitted remote-control systems, so the house-proud British music lover now wants for nothing.

Am I making a mountain out of a molehill? I hope not. Every time I go to a hi-fi show, I hear some conversation about how “serious” hi-fi never receives the exposure it deserves. At last, there appears to be some serious effort in the UK to expand the market by satisfying a greater variety of needs, and it can only be to the good of hi-fi as a concept. The beauty of it all is that these non-hobbyist customers are going to get good sound quality along with domestic acceptability, even if they don’t come right out and ask for it. This is the best thing to happen to high-performance products since Austin-Healey put windup windows in the Healey 3000. Let’s hope that all concerned succeed in enhancing hi-fi’s general appeal.

Italy: Bebo Moroni

You are all probably aware that Italy is the country of miracles, perhaps because of the Saints—they are supposed to live around here but I have never actually seen one—but nothing could be farther from the truth than the presence of the Pope. (I have no idea why Saint Peter decided on Rome to build his Church; however, we do have a lot of beautiful monuments and paintings—it’s the only positive thing about the whole situation!)

The only miracle the Italian Government has been responsible for since the Unification of Italy in 1870 was its own continued existence. But, but, but… Gore Vidal, one of the American writers I appreciate the most, prophesied around 30 years ago that “Italy will be the guide of Western Europe.” Now people are saying that that prophecy has come true—we haven’t noticed it, but if a lot of important economists and intellectuals say that it is so, then it must be so. (Except that my agnosticism refuses to lie down and die.)

Anyway, in my opinion, all the Italian miracles have been due to a number of intelligent, stubborn, and able persons, and the final miracle, the economic recovery of our country, is due—I say with pride—to the ingenuity of the common Italian people. They have a tremendous ability to survive—almost all Italians have two or three jobs, only one of which is regular. With regard to our special area of interest, Italy is very strange. It is one of the largest markets for high-end audio in the world—the largest for Audio Research, Apogee, ProAc, etc.—which is pretty funny for an economically confused country of just 60 million souls. It is even more funny if you consider
that the country's capital city—I suspect that everyone will be familiar with the name Rome—doesn't even have a concert hall where classical music can be presented and has to rent one from a foreign State, the Vatican.

OK, the high-end market in Italy is healthy, we import almost all "esoteric"—I hate that word—brands from all over the world. But what about home-grown Italian hi-fi? It is difficult to answer that question. At one time there used to be a lot of Italian brands, but Government policy concerning the electronic industry, as well some blind decisions made by the managements of some of the companies, pushed many into bankruptcy. These days, the number of brands is small, but the quality, particularly when it comes to large loudspeaker companies like ESB and RCF, is high. In this first column, however, I want to tell you the story of a small Italian miracle: Sonus Faber.

_Sonus Faber_, literally translated, is Latin for "The Sound Factory," and all the models from this small but exceptional brand have Latin names to emphasize the absolute "Italianism"—nothing to do with nationalism—of their styling, sound, and taste.

The story of Sonus Faber began in 1980 when the founder of the company, Franco Selbrin, showed the press an incredible speaker system called the "Snail," a masterpiece of carpentry and design. The system used JBL drivers and consisted of a centrally sited, uniquely styled subwoofer, with two satellites attached to it via adjustable arms. A styling feature was the use of big-headed wood screws, just like one of Leonardo's machines. Both subwoofer and satellites were constructed from genuine, massive Italian walnut (a very rare wood, nothing like the common walnut found in most loudspeakers), as was the cabinet for the electronic crossover network.

The sound was, in fact, not that good, but as a first appearance on the hi-fi scene, the Snail was an impressive system. It was not conceived for commercial reasons, but as an introduction to the future plans of Sonus Faber. Few systems were sold—the price was, for those years, incredibly high—but it effectively paved the way for the next Sonus Faber loudspeaker, the Parva.

The Parva—Latin for "little"—was a very compact loudspeaker, measuring around 15" by 12" by 10", and supported by an adjustable stand like one of the arms of the Snail, with a base made from fossil stone. (You could see the marks of shells, and sometimes the fossil shells themselves, in the base.)

Focal drive-units were used; the sound was not too bad, but was affected by a noticeable metallic note in the high midrange and a thin character to the high treble. No matter, these were still first steps, with the inevitable teething faults.

And then, in 1984, came the Parva FM2, a revelation for the Italian compact loudspeaker market which, at the time, was dominated by the incredible success of the ProAc Tablette. Parva FM2 was a simple but really right design. The cabinet was—is!—constructed from massive Italian walnut, with rounded corners to the front and rear panels and precious inlays to make it look like a solid body. The soft shape of the finish, the value, the beauty, the intense and at the same time delicate aroma of rare Italian walnut, make the FM2 one of the most fascinating loudspeakers ever seen.

The components used in the Parva FM2 are a KEF woofer and a T52 tweeter. These are combined with the simplest of crossovers with 6dB/octave slopes realized with two Wondercaps and a hand-wound coil. All cabling is pure OFC Litz. Because of the very solid and smooth cabinet, the complete absence of resonances gives the Parva FM2 a very tight and controlled bass, which goes deeper than many bigger loudspeakers; a liquid but just a little bit cold midrange; and velvety, pleasantly sweet highs, affected by a slight but perceptible metallic nuance in the lower highs. These little faults don't in any way injure the performance of this little beauty; it is reinforced by
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a spacious and deep image, despite lacking a certain air in the highs due to the intrinsic sound of the KEF tweeter (now replaced by a Dynaudio D28).

Immediately after the introduction of the Parva FM2, Sonus Faber introduced the Minima FM2, smaller than the Parva but with the same kind of cabinet; the proportion between the shape of the cabinet and the fine craftsmanship of the woodwork is a delight to see. The Minima FM2 sounds clearly different from the Parva: more aggressive, airy, and dry, with a more limited bass due to the smaller size of the cabinet, but one that is very tight and powerful. The imaging was more delicate and more accurate at the top end, but I continue to prefer the Parva FM2. However, I must admit that the Minima, in its latest version, is one of the best small loudspeakers I have heard.

Last but not least, in 1985 Sonus Faber introduced its first electronic product, a smart and advanced preamplifier, the Prius, realized with very high-frequency tubes—yes, two years before C-J introduced their Premier Seven. The tubes and circuitry are mounted on a floating chassis to prevent the tubes picking up any vibration. The cabinet is constructed from massive Italian walnut, with a black grille to protect the tubes. Knobs are gold-plated, as are the tube pins, while the power supply is mounted in a separate chassis. Again, a product that sounds gorgeous but is also a precious piece of furniture.

The sound of the Prius is in many aspects better than that of the Audio Research SP8, but the price is considerably lower: about $900 at the time it was introduced. With the change in exchange rates, the Prius will probably not be so competitively priced in the USA, but I urge you to listen to it when it becomes available. (I think that will happen quite shortly.)

I think 1988 will see the start of worldwide success for Sonus Faber, an unexpected success for a small, craftsmanlike brand. Sonus Faber products, available in almost all European countries (Ricardo Franassovici of Absolute Sounds is the UK distributor), should be imported into the USA some time this year.

This has been the story of a Little Italian Miracle. I'll be with you again soon.

Biographical note: Bebo Moroni was born in Rome in 1959. After studying the flute at the St. Cecilia Conservatory, he graduated from the Beauty Art Lyceum. From 1979, he taught the History of Art and Italian Literature at the Donatello Lyceum of Rome, and from 1978 he has worked as a DJ, speaker, music critic, and director for RA1 (the Italian National Radio/TV network). Bebo began his activities as a journalist in 1977, for Muzak magazine, Suono/Stereoplay, l'Audiogiornale (where he was Sub-Editor), Audionews, and finally AUDIOPreview, where he is responsible for the high-end section. In 1982, he directed the children's lyric opera, Immagini di un Opera (In) Cantata, with the music of Hindemith, Bussotti, Britten, and Lucci, which was presented by the Academy of St. Cecilia and The Philharmonic Academy of Rome. He is also a contributor to several Italian and foreign newspapers and magazines. At present he is the Artistic and Product Manager of AUDIOPrecords, the record label associated with AUDIOPreview.
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Winter CES, 1988, was not quite the triumphant event the industry had expected. Although the weather in Las Vegas was wonderful—warm and sunny—it seemed that everyone who came for the show either had or was coming down with some kind of malaise. Among our own ranks, John Atkinson spent one show day in bed with a fever of 102°, George Graves developed a cold of heroic proportions, Larry Archibald left the show with the makings of the mother of all colds, and Yours Truly got laryngitis and toured the show croaking like a bullfrog. Meanwhile, the East Coast was getting its third blizzard of the season, and many dealers who had planned to attend CES were forced to reschedule their flights or reconsider whether it was worthwhile coming at all with only two days left. Many didn’t—the result was the first drop in CES attendance in years. This was not very visible, though, at the Riviera hotel, the Vegas home of high-end. Most exhibitors were in fact pleased with the turnout and the response to their new products.

Nonetheless, there was a prevailing spirit of anomie at Winter CES—as though everyone was waiting for something to happen. Certainly, this was not because of any lack of new audio products; there were at least as many of those as at any previous Winter CES. But there weren’t any breakthrough products, whose introduction might have given new direction and impetus to high-end audio. Instead, there were simply more of the usual evolutionary advances: improved versions of last year’s power amp or preamp or cartridge, often without even the cachet of an appended Mark II or Series B.

Hanging over everything like a pall was the spectre of DAT, whose presence in almost every mainstream-audio exhibit only served to underscore its continuing absence from the marketplace. There was a feeling that the consumer audio industry, having decreed that DAT was to be the next revolution, was now marking time until that new medium could be released and the game of technological one-upmanship could be resumed. Almost every
major Japanese manufacturer was showing DAT machines, but unlike previous years, no one at this show was predicting a US release date. “In the future” was as far as any manufacturer would commit itself. Professional DAT machines are unaffected by the Congressional Copycode flap, and could be in US dealers’ tomorrow if they were available now, but Sony was the only firm showing pro DATs, and they didn’t think they’d be available until Spring ‘88.

There was far less truly bad sound at this high-end show than at any in the past. In fact, I don’t think I heard more than six demos that I would have described as being worse than mediocre. And I noticed something else at this show: signs that convenience of operation is becoming respectable in high-end audio. Once scorned as an affectation of bells-and-whistles Japanese receivers, the lack of remote control in high-end products was dismissed as “part of the price” of good sound. It is now showing up in increasing numbers of high-end audio products. Even the use of multicolored status lights to indicate what’s doing what is becoming commonplace in perfectionist products. In fact, there was never a good reason for scolding such niceties in the first place; their bad reputation evolved from their initial use on products whose sound quality could have been markedly improved had the cost of those conveniences been applied instead to better power supplies, capacitors, and circuit design.

I did not get to the convention center this year, so any mentions in this report of exhibits there are based on hearsay. I did “do” all the high-end rooms, though, so I believe the following is a reasonably complete rundown of equipment that was shown for the first time at Winter CES.

Phono Products
Just when you thought ol’ tick-'n-pop vinyl had been laid to rest, here comes another new company with another ostensibly state-of-the-art turntable. (As George Graves pointed out, a technology never seems to be perfected until it becomes obsolete!) This one is called the Basis Debut, and the manufacturer assures us it is a “finalized design.” (“You are not used as a test lab for an unfinished product,” says the blurb sheet.) A bold assertion in the high end, and perhaps a rash one. The Debut ’table features a fluid-damped hanging suspension, adjustable while playing; a 2” acrylic motor board and platter; the platter’s center of gravity above its pivot point; and belt-drive from an electronically powered DC motor. The price: a mere $5000.

The Graham tonearm, previewed by coincidence in Greenspun’s & Stromeyer’s blind tonearm-test report in Stereophile Vol.10 No.8, is another new product from a new company in the field. A viscous-damped unipivot type, the arm’s design attempts to absorb and dissipate cartridge vibrations within the arm itself, rather than trying to conduct them as efficiently as possible to the motor board. The result, according to the designer, is improved isolation of the cartridge from arm-borne vibrations picked up from the turntable unit. Special, ingeniously contrived mounting jigs are supplied, to make precise installation and setup as simple and easy as possible. Projected retail price: $1275.

Oracle unveiled an Alexandria Mk III turntable which, despite the name, is an entirely new design. In production now (but back-ordered as of show time), the Alexandria III is selling in the US for $895, without a tonearm.
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SOTA, which is not a new company, unveiled nonetheless a new super-turntable, the Cosmos, featuring improved construction materials for better control and suppression of resonances. Since their Star Sapphire is already very nearly perfect, it will be interesting to hear how much more nearly perfect the Cosmos is. Its target price is $2500 to $3000, sans arm of course.

Denon DAP-XX prototype preamplifier features input A/D converters running at 48kHz (44.1kHz for direct digital CD input), and tone, balance, and loudness controls operating in the digital domain (Manufacturer's photograph)

CD Equipment
An outfit called Audio Access was showing an incredible-looking CD “carousel” that holds up to 240 CDs in what looks like an oversized round photo-slide tray, and allows any program material from any disc to be selected or programmed from a remote location. The PX-240 will store up to 10 “play lists” of up to 99 tracks or discs each, allows for playback by category (such as “slow movements of symphonies” or “60s rock”), and has a maximum access time of 10 seconds per selection. The electronics seem respectable, too, with 4x oversampling and dual 16-bit DACs. There are analog and digital outputs, as well as an RS-232 computer interface (for automated operation), provision for loading and playing a single disc, battery backup for all stored programs, and a “handsome leather binder” for storing all the liner notes that go with the discs. The unit will sell for around $5000, without any of the hardware needed to automate it or operate it from remote locations.

Following closely, as it does, on the heels of the Lumintrak 32-bit 32-times oversampling player hoax, Cambridge Audio’s claim of a 32-bit 16x-oversampled unit can expect some consumer skepticism, but this is legitimate! Like its predecessor, the CD-1, the new CD-1 Series 2 is a two-chassis player with a mechanically isolated deck, separate power supplies, and what is claimed to be the most extensive error-correction system currently available.

Cambridge 32-bit, 16x oversampling CD1 (Manufacturer’s photograph)

The 16 additional available bits are used to increase the accuracy of D/A conversion by preserving the full word length of intermediate bit calculations (of which the excess bits are normally discarded) and to avoid the use of the LSBs where DAC nonlinearities are most severe. The 16x oversampling removes digital spuriae to well beyond the audible band, allowing for simpler filters and less in-band phase shift. There are no analog stages in the CD-1-2; output signals are drawn directly from the filters. The player will be in production by mid 1988, but no firm price was available at show time.

Kyocera’s exhibit featured four CD players ranging in price from $350 to $800 but varying little in claimed performance specs. They differed mainly in the number of CD-related features offered.

PS Audio had a hand-wired pre-prototype of what they called the Digital Link—a universal D/A processor with some unique features. It will decode any existing digital format, optical or electrical, from CD, satellite, DAT, or whatever, with automatic selection of sampling rate from 28kHz to 50kHz. Playback dither level is user-variable from 2dB (for DAC correction) to 16dB (for spatial enhancement), and a plug-in DAC-and-filter board allows for a choice of brands, from Burr-Brown through Sony and Yamaha to Philips. All filtering is passive, all voltage amp stages are FETs, and the

Stereophile, March 1988
How a 77-year-old became the first name in digital audio.

Denon's been involved in every phase of music reproduction since the days of wind-up record players. So after seven decades of breakthroughs in studio recording, disc pressing, home high fidelity and professional equipment, we were uniquely prepared to take the next step. A tape recorder so fundamentally different, it would obsolete every previously accepted notion of how good recorded sound could be.

In 1972, Denon researchers achieved their goal. The world's first digital recorder worthy of commercial record production, the legendary Denon DN-023R. We quickly put our digital innovation to use, producing digital processors, digital editors, digital mixers, and the world's first digitally-recorded LPs.

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ALL OUR COMPONENTS REFLECT
LESSONS LEARNED HERE.

For example, the D/A converter found in every Denon CD player comes directly from Denon studio recorders. Unlike conventional designs, Denon's Super Linear Converter detects and corrects D/A transfer distortion.

Perhaps that's why each succeeding generation of Denon CD players is eagerly anticipated by the world's audio critics. And why they've variously hailed our CD players as "a winner on every count," "the player I recommend most highly," "superlatives have to be used," and "in several respects, the best I've ever heard."

Reactions which simply demonstrate one point. It's a lot easier to make audio sound like music when you really know what music sounds like.

THE NEW DCD-1500II. ITS SUPER LINEAR CONVERTER COMES STRAIGHT OUT OF
DENON STUDIO RECORDERS.

"Look into the interior of this player reveals that Denon's engineers were not taking any shortcuts whatsoever."

Germany's Hi-Fi Vision on the DCD-1500
device will deliver digital or analog outputs from all input sources. Slated for June release, the Digital Link with a Burr-Brown DAC board will sell for "between $800 and $1000." Optional boards, to be released later, will cost around $200 each.

Sansui added another two CD players to their line, both engineered to reduce internal vibrations which (they claim) increase modulation noise. Both the CD-X701i ($850) and the CD-X501i ($600) have 4x oversampling and separate 14-bit DACs. The 701 also has balanced outputs and separate power supplies for the servo system and audio circuits.

Sony was reticent over the relationship between themselves and CBS Records since their takeover of the latter. In fact, we gather that Sony's Akio Morita intends the hard- and software companies to be run totally separately, along the lines of Philips and Polygram in Europe. Sony had their DAT recorders on show, including an attractive consumer portable unit in the same chassis as the analog TC-D5M cassette recorder, but, according to Jason Farrell, their VP of Corporate Communications, "Sony will not be introducing any marketing plans at this show." Another quote—"Feature differentiation has become an increasingly important factor at retail"—indicated the direction Sony feels the CD-player market is going, and introduced a complete new range of players marked by features connected both with ease of use—compatibility with 3" CD "singles" in particular, which Sony feels to be an important weapon in getting under-25s involved in CD—and, we would hope, with sound quality. The latter is connected with a new 8x oversampling chip, the CXD1144, which appears in the top models, the CDP-507ES and '707ESD, the latter at $1800 combining it with true linear 18-bit DACs. We will report on this machine as soon as we can get our hands on a sample.

Yamaha introduced upgraded versions of their budget-priced CDX-500 and -400 models, while dropping prices on both. (And this at a time when the dollar continues to lose ground against the yen!) Both the new models—the CDX-410U and -510U—now have Yamaha's "exclusive" tape-edit feature, which juggles selection timings on a single disc so as to fit the maximum number of selections into a specified length of recording tape. The 510U also incorporates Yamaha's "hi-bit" DAC, which makes a 16-bit converter behave like an 18-bit one by boosting signal level whenever the highest 2 bits are switched off. (This reduces the amount of use of the LSB, where DAC nonlinearity is at its worst.) Prices for the new models are $319 (510U) and $259 (410U).

Electronics

Audio Research, which had a silent exhibit at this show, announced the release of a new power amplifier, the D-125. A tube/FET hybrid design, similar to that of the M300 (reviewed in Vol.10 No.9), the D-125 has a 120Wpc rating into all standard loads, and is fitted with ARC's "tube-saver circuit" which prevents tube damage due to potentially damaging accidents (such as dropping the cartridge onto the disc). Apparently intended to replace the D-115 in ARC's line, the D-125 is claimed to sound less tubelike. It will list for $3995.

Berning was showing their first new preamp in eight years, the TF-12. Unlike the previous TF-10, which used hybrid tube/solid-state circuitry like that of the Audio Research SP-11
The new SP11 Mark II from Audio Research: setting the standard, again.

A classic reborn.
Traditional wisdom holds that you don't tamper with success. But at Audio Research, the working philosophy has always been to make important progress in music reproduction available to those music lovers who care to hear the difference. So, two years after the introduction of the original SP11 preamplifier, Audio Research announces the heir to its acclaimed reference standard: the new SP11 Mark II.

New clarity, dynamics, realism.
The new Mark II offers startling improvements in musical realism compared to the standard-setting original. First, there is a soundstage that extends even further beyond the speakers, laterally and front-to-back. Within this stage, instruments and voices are focused more precisely than ever before, with an uncanny rendition of proper size and location. Bass response is both deeper and more detailed, for a more dynamic foundation beneath the musical program. And, overall, you'll hear a breathtaking new clarity that simply lets a recorded musical performance through as never before—while telling you more about the quality of the transcription medium as well. The new SP11 Mark II is truly the most revealing, yet "invisible" preamplifier ever from Audio Research. And, we think you'll agree, one of the best values in high-end audio. Again. Audition it soon at your authorized Audio Research dealer.

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Klyne previewed their first power amplifier

(stolen from Berning, according to them), the TF-12 uses differential circuitry in its high-level stages. Volume and balance controls use neither mechanical wipers nor voltage-controlled amplifiers. Instead, solid-state switches are used to select the desired points on a ladder of resistors, a concept very similar to that used by Linn in their LK1 preamp. Front panel LED displays show each channel's gain, the Teflon circuit board minimizes dielectric absorption, and the oscillator power supply replenishes storage caps 140,000 times per second. The dual mono TF-12 includes a multistage line filter/regulator, a nonmagnetic aluminum chassis, and infra-red remote control of gain, balance, and off/on. Price: $2950.

The audio talk of the show was Bob Carver's "Silver Seven" amplifier, a 470Wpc two-chassis "monoblock" weighing in at an impressive 140 pounds per channel. Claimed to sound like a no-holds-barred tube amplifier, there is good reason to believe that it might in fact be that, because it is an all-tube amplifier, using 156550s per side. (That's right; one is a voltage regulator.) Carver had not yet tacked a firm price on this, but averred that "it won't be cheap." This may never be a big seller, but it has certainly established Carver as a solid member of the high-end (read "crazy") audio fraternity.

Conrad-Johnson introduced two new tube preamps, the PV-8 ($1695) and PV-9 ($2950), both based on circuitry developed for the Premier 7. Both use film-type capacitors throughout in the power supply — there are no electrolytics at all — and passive RIAA equalization. All small-value caps in the 8 are polypropylene types; all the caps in the 9 are polypropylene, and it has a beefier power supply than the 8. C-J was also demoing their entire Sonographe line, including their recently introduced SC-1 preamp ($595), which just went into production last month.

Counterpoint demonstrated their remarkable SA-11 line preamplifier with Infinity IRS Beta loudspeakers. The dual-mono all-tube device has no phono preamp stage; that is available separately (at $1000) for those who insist on playing old-fashioned LPs. This may have been the first high-end electronics product to feature full remote control, but it now has lots of company. List-priced at $4995.

Imaginer David Hafler holds the prototype of his preamp remote-control

The David Hafler Company, under the new ownership of Rockford-Fosgate, was showing a new and interesting-looking preamp — one of the first audiophile products featuring fully remote control. The under-$1000 unit, with no model number as yet — commercial launch will be in the late Spring— uses CMOSFETs for all source switching, eliminating all switches from the signal path. Even the volume and balance controls are fully electronic; the usual potentiometers are replaced with a DC-feedback-controlled optical/photocell arrangement.

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1 Surely this is wrong. I would have thought that Carver's claim would be that this all-tube behemoth sounds the same as a $500 solid-state amplifier. That is, if his design philosophies are to be consistent with the implications inherent in his advertising.

—JA

Stereophile, March 1988
which cannot develop the noise or intermittent-contact problems of mechanical element/wiper controls. All active devices in the signal paths are FETs, whose transfer characteristics most closely resemble those of tubes. (The best preamp I have heard to date is an all-FET unit.) The built-in preamp section will accept MC or MM cartridges. The optional remote (included in the $1000 price), on the other hand, has knobs for volume and balance, whose feel and action replicates those of the usual front-panel pots. The controller can perform any function available from the preamp's front panel, and control can be switched from home base to the remote at any time by depressing a couple of buttons. The first truly unique product to come from Hafler in some years, this represents the kind of imagineering that gave his products pre-eminence in the field some years ago.

Kinergetics undraped a KPC-1 passive control center providing only input switching and control of line-level volume and balance, with even the volume control bypassable if desired. The list of sonic attributes cited on the blurb sheet, and the claim of dual-mono construction, seem a bit absurd when you consider that all one is listening to are passive components, but we know better than that. Priced at $495, it includes equally passive switching for seven audio and four video inputs. Kinergetics also had two new power amps on display: a KBA-75 Class-A unit rated at 75Wpc ($1295)—billed as the first class-A amp ever built with Kinergetics' hysteresis-cancelling circuit, and a 200W monoblock KBA-202 priced at $1990/2. (62dB will produce 1.26V of output for lmV in.) Signal/noise is claimed to be from 10 to 15dB better than "the best competing preamps." A 70dB version is available on special order at no increase over the $1895 base price.

New Mark Levinson products happen so rarely that parent company Madrigal held a press breakfast to announce their No.26 preamplifier. A dual mono unit, it deviates from M-L's previous "minimalist" designs in that it offers a full complement of inputs, outputs, and operating features. It has balanced outputs, remote switching (via relays) of sources and operating modes, the minimum number of switches in the signal path, and the shortest possible wiring routes. Three separate power supplies in a separate module feed the audio channels and the relay supply. The basic unit, with six line-level inputs, costs $3990; add-on pair. The 75-watter has a servo-controlled DC-coupled signal path and a dual-coil toroidal power transformer, claimed to deliver 9kVA of power. (That's 9000W! Could that figure possibly be correct?) The 200-watters are also DC-coupled, have no overall feedback, and are powered from separate toroidal power transformers for the voltage-amplifying and power-output stages. Of course, they also use Kinergetics' "hysteresis-distortion-canceling" circuitry.

**Lineage**, partnering Saul Marantz with John Curl, finally showed its first product: the SCP-2 MC-to-line preamplifier. A dual-mono design with DC-coupling throughout, the device uses FETs for all amplification, and has passive EQ for the HF attenuation part of the RIAA playback curve. Input impedance is continuously variable from 10 to 200 ohms, and the standard model has 62dB of gain at 1kHz.

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2 Strictly speaking, hysteresis is only a characteristic of magnetizable materials such as iron. The similar characteristic observed in capacitors is called dielectric absorption.
options include a balanced-input line board and high-gain and low-gain phono boards, each adding about $700 to the base price.

**Melos** premiered their CDT "preamp," an all-tube analog filter and line amplifier. Designed primarily for use with Melos's CDT compact-disc player, it can replace the analog sections of other 4x-oversampling players whose solid-state sound may be less agreeable than is obtainable from good tubed components. The CDT has a toroidal power transformer and separate regulated supplies for the CD and line sections, and accepts four line-level inputs. Priced at $1895.

As if it weren't retrograde enough for some contemporary electronics designers to be using 7- and 9-pin miniature tubes, a new firm called **MFA Systems** has gone back 10 years and dredged up the large octal-base voltage-amplifier tube as the basis for their designs. Claiming sonic superiority in every area but bass, MFA has built three preamps and three power amps around these, and were showing four models at CES. Their flagship preamp, the Luminescence A-3, is notable in that it eschews solid-state voltage regulators for tube ones, on the basis of alleged improvements in the sound. Also claimed (with some theoretical justification) is superiority of transient and slewing performance because of the tubes' higher current drain. Although relatively narrow in bandwidth, with a 20-Hz upper limit, the unit's specs are unusually impressive. It lists at $3400. The Mantra, a smaller preamp with similar specs, sells for $1995, while their smallest, least expensive (the Magus) lists for $895, making it one of the cheapest tube preamps available. The M-75 ($1660/pair) and M-200 ($4950/pr) are monoblock power amplifiers with ultralinear outputs, heavy-duty regulated power supplies, and output ratings according to their model numbers.

**Mirror Image** was showing a pre-production prototype of their first preamp, the 0.2P. An all-solid-state unit, it will sell for around $1500 and is expected to be available around April of '88. No other details were available at show time.

In addition to their interconnects and cartridges, **Monster Cable** was showing an impressive-looking amp/preamp set made by a Danish firm called **Primare**. The Series 928 preamp and monoblock power amps feature symmetrical circuitry and balanced inputs and outputs. The preamp has an absolute phase switch, MC inputs with twelve input-load settings, and infra-red remote control (the latter is claimed to be a First in high-end, but isn't). The monoblock power amps are rated at 1000W peak into 0.5 ohms (40 amps of current). At $17,000 per set, these had better have a lot more to offer than their literature would suggest!

**Musical Concepts**, formerly a modification service, introduced the first of their own products under the name Musical Design. The D-140 is a solid-state stereo power amp rated at 140Wpc, with a bipolar front end and MOSFET outputs. Projected price is "about $895."

Power Audio Distributors are importing the **Audio Innovations** line of low-power tube amps from the UK mentioned in my report from the British Heathrow Penta Show in Vol.10 No.9.

**PS Audio** has refurbished their entire amp and preamp line. The 4.5 preamp is now the 4.6 and costs $659, while the 200C power amp is now the 200CX, newly priced at $1950. The 100C power amp, first shown at Summer '87 CES, is now in production, as is an entirely new replacement for the 5.0 preamp: the 5.5. Both cost $1195. Upgrades for the previous models are available at "reasonable" prices.

**Quicksilver Audio** was also showing a brand-new preamp, with the incredible bandwidth of 1Hz-1MHz. The unit, with no model number (it's the Quicksilver Preamplifier, period), also lays claim to a 300V input-signal capability (!), 65V output capability, and 1200mV phono input capacity. Talk about overkill! It will only take MM cartridges, though; a head amp or transformer is required for MCs. Projected price is $1075.

**Revox**, which already had available a fully remote-controllable integrated system, has one-upped themselves with a programmable timer and computer interface and a software program that allows complete hands-off auto-
More and more sound engineers are taking our Professional Series equipment out of their homes and into sound studios, night clubs, even concert halls. Because, right out of the box, our top-of-the-line audiophile gear meets the specs of these demanding applications.

Take our Professional Series Alpha-650 power amplifier. It delivers 300 watts per channel (650 watts mono) through rock-stable hybrid Class AB circuits. Input is via balanced-line XLR or RCA-type connectors. There’s electronic protection against shorts, overheating, and stray DC. And our Professional Series EQ-30M Mono Equalizer and CO-23 Active Crossover Network add 32 bands of equalization, plus 22-point crossover capability, for taming virtually any listening space.

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Or, better yet, just take in a concert.
mation of their entire system for a virtually unlimited period of time. Almost every parameter of system operation can be pre-programmed, from varying volume settings (including fadedowns and fadeups) to FM channels, CD tracks, and specific locations on audio cassettes, and programming can extend over hours or days. The special software program (for MS-DOS or IBM compatibles only) uses on-screen prompts for programming, and is claimed to be user-friendly. The B203 timer/controller that makes all this possible (with Revox Series-200 components only) costs $600; the price of the software has yet to be announced.

VTI had two new tubed amplifiers, a dual-45W for $1300, and a formidable-looking two-chassis "monoblock" 100W called the Ichiban, which sells for an unlikely $17,000/pair. The pure-class-A Ichiban uses a single pair of large triode transmitting tubes (845s), and operates from a B+ supply of 1200V! Designed for the Japanese market, the Ichiban's tubes are completely exposed so the owner may bask in their warm red glow.

Sumo's only new product at this show was their Aurora tuner, list-priced at $649. Described as sounding much like the legendary Charlie the Tuner (a truly dreadful pun!) of seven years ago, but with much-improved weak-station performance, the Aurora is a low-profile AM/FM unit with rotary digital tuning, vernier tuning trim, 8 memory presets each for AM and FM, selectable wide or narrow IF bandpass, and an impulse-noise-reduction circuit.

Exposure's VII preamplifier features dual-mono construction

The English Exposure line, which includes some unusual devices (like an input multiplier) among their modestly priced preamps, power amps, and integrateds, is now being distributed in the US by a Chicago-based outfit called Audiphore. Apart from some intriguing features (such as a claimed "infinite" channel separation for their preamp), most of these seem little different from most of their price-wise ($600 to $2655) competition.

Rotel Hi-Fi, hardly a household name in the US, has been a popular line in the UK for some years and is now available here through the firm's own import office. They have an extensive line of receivers, power amps, preamps, and tuners, all modestly priced and modestly spec'd, and all with a good reputation for sound quality in the UK and in West Germany.

Loudspeaker Systems

B&W wasn't showing anything new at this show, but I mention them here because their 801 system was among the best-sounding speakers I heard there—in Tandberg's exhibit.
The Delta Mode Power Amplifier.

Emotional Technology.

The very essence of the Delta Mode differential topology is to intrinsically oppose distortion, yet effortlessly magnify the music while accurately preserving its harmonic phase structure to present an exquisitely detailed sonic picture of the live performance.

Regardless of your level of listening experience, the Delta Mode's unique sonic capabilities will transport you to center stage.

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Avalon Acoustics three-way Prism loudspeaker made great sounds in the Rowland Research suite, according to JA. The room was fully live-end/dead-end treated with RPG diffusors.

The room. Tandberg wasn't showing anything new either.

**Clements Audio Systems’** RT-7, a "culmination [sic] of years of research . . .", is a two-way system mating an 8" cone woofer to Clements' 7" planar ribbon driver via what is claimed to be an almost phase-shiftless crossover. The sound was in fact very good, although it should be, considering the system's $1900/pair price tag.

**Dahlquist** added two new models for their M series: a flagship-model M909 and a bottom-model M903. The 903 is a mini-speaker designed for maximum imaging performance, while the 909—on demo in the Dahlquist room—"has critical inner bracing and damping" and is claimed to deliver "extraordinary dynamics and sound staging."

**Fried Products Company** had yet another new model, the D-2, which uses transmission-line loading for both the midrange and LF drivers. Priced at $3000/pair ready-built, or $1080/pair in kit form, these had immensely impressive bass performance, going at least as deep as and with noticeably better detail than the G-3s, which were also on demo. (We had a pair of the G-3s for test—see Vol.9 No.7—and for reasons Bud Fried was unable to explain, could never get anywhere near the kind of deep low end that I heard them producing at CE Shows.)

**Lantana** was showing their line of several different models of loudspeakers: the Marten ($950/pair), the Minx ($1150/pair), and their top-of-the-line Sable ($1350)—a 4-piece satellite/subwoofer system. None of them sounded terribly distinguished, but all were quite good. Amazingly, when they switched from one model to another, the only immediately audible difference was at the low end. Contrast this with most other firms, where every speaker sounds like a product from a different company. Such consistency as this indicates not only a strongly felt philosophy about what musical midrange ought to sound like, but the engineering know-how to achieve it consistently.

**M&K** was showing a powered subwoofer ($1200) built into the base of a TV stand. A clever idea, and it sounded very respectable.

**Mitek**, yet another new loudspeaker company, was demoing their ZSE 380, which is about as odd-looking as any speaker you'll find. Vaguely resembling one of those Scandinavian "kneeling chairs" that are supposed
Technology You Can Hear.

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Nothing we encounter in everyday life, including radio frequencies, TV frequencies, X-rays, or light frequencies, spans such a broad range as the audio spectrum. The complexity of 10-octave, 20-20,000 Hz music signals traveling through a wire, each creating their own varying electromagnetic fields superimposed on each other, causes audible "time phase" and amplitude errors. And makes life difficult for an audio signal.

We'd like to introduce you to the M-Series solution, the ultimate expression of Monster Cable®'s "Bandwidth Balanced®" technology. Combined with our latest "MicroFiber™" dielectric, the M-Series controls these distortion-producing electromagnetic fields with exacting precision. And provides you with two cables of unprecedented sonic performance: The M1000™ Audio Interconnect Cable and M1™ Speaker Cable.

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First, Monster M-Series incorporates "Bandwidth Balanced" multiple-gauge "wire networks" and innovative cable winding techniques to selectively control electromagnetic fields and reduce "phase distortions" and "time smear." Accuracy, depth, and power are restored to the original signal. There's greater clarity and realism. And a balanced, coherent sound throughout the entire audio spectrum that is unlike any you've ever experienced from an audio cable.

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The advanced technologies of Monster M-Series, as heard in M1000 and M1 Cable, represent state-of-the-cable art. No other single technology, no matter how expensive or sophisticated—including linear crystal, long-crystal silver, or solid-core wire—accomplishes this task like the Monster M-Series.

Listen to your favorite albums, tapes, or CD's with the M-Series and the true sound of vocals and instruments will be revealed with newfound richness and depth.

We invite you to audition the M-Series in your system. It's a technology you'll not only hear, but love to listen to.
Mitek's enclosure-less woofer uses electronic EQ to get bass extension.

To prevent back strain while seated, it consists of two square enclosure-less panels, a small one mounted above a larger one, with a substantial space between them; it totals about 3 feet high. ZSE stands for Zero Stored Energy, the idea being that the less resonance, the better. I could not hear any resonances, which is good. Neither could I hear any bass, which isn't. The ZSE 380 is claimed to extend to 35Hz. Not in that room, it didn't. The price? $1800/pair, including an active "controller" that is supposed to equalize/boost the low end.

Now Hear This speakers are designed by ex-AR engineer Ken Kantor.

NHT (Now Hear This), which appears to be a new company featuring ex-AR "Magic Speaker" designer Ken Kantor, unveiled its $300/pair Model I and $700/pair Model II. The latter is essentially a two-woofer version of the small two-way Model I in a mini-tower configuration, and is claimed to differ from the countless other ostensibly full-range box speakers in that it has no crossover within the critical midrange, the woofers being crossed over to below 100Hz. The two woofers are operated in parallel to obtain a claimed low-end limit of 45Hz. (The I cuts off at 65Hz.)

Onboard Monitor, another new manufacturer, introduced their "SpaceDrive SD-8," an unusual-looking compact box system with a 45°-angled front panel which facilitates placement in a wide variety of room locations, including corners, ceilings, or wherever. Available in three conservative standard colors, over 100 optional colors are available, and computer analysis allows custom matching to a submitted color swatch. The speakers list at $489/pair.

It must be perfectly obvious to any audiophile that what the world needs more than anything else is another complete line of multi-way box loudspeakers. Well, that's what we have. Precise Acoustical Labs is the latest name to be added to the 260-some that are already listed in Audio's current Annual Equipment Directory. (Actually, it's "a division of Onkyo USA.") And it differs from the others in another respect: involved with the company is Keith Johnson—one of the three best-known recording engineers in high-end audio.1 For years, Keith has used monitor loudspeakers of his own design for evaluating his recordings.

1 The others are, of course, Dave Wilson and Doug Sax.
which should give them more than the usual credibility for accuracy. But Precise loudspeakers are not exactly Kj designs; the literature ascribes them to a "development team" — which is to say, a committee. What we have here are five loudspeakers, ranging in price from $220 to $1400 a pair. (I would have felt more comfortable had there been only one, representing a "statement" of their design philosophy.) They all sounded quite good, but they also sounded different, and none seemed notably better than a lot of other box speakers at the show. We shall, nonetheless, try to obtain a pair of the flagship models for review, if only because Keith has demonstrated that he hears unusually well.

ProAc added a new system to their line: the superflower [sic]. This reflects the industry's sudden (it seems) discovery that it may be the narrow width of mini-monitor speakers that makes them image so well. ProAc's superflower is a mere 8" wide by 9½" deep, stands 42" high, and is claimed to be only 3dB down at 36Hz. They sounded quite respectable, but at $2300/pair, they've got some mean competition.

And yet another new company, Star Audio Sound Systems (SASS), showed a pair of moderate-sized floor-standing two-way dynamic systems designed by Richard Sequerra, who is best known as the designer of one of the best FM tuners ever made. They sounded quite good, but there are so many similarly priced speakers around which also sound quite good that it is difficult to get excited about these. It's ho-humsville. Priced at $679 and $899/pair, respectively, they apparently differ only in size.

Scandinavian Sound was demoing the latest concrete-enclosure system from Rauna—the Balder. Priced at $1500/pair, it's a two-way three-driver system which, like previous Rauna designs, is built to resemble a steamship vent-tilator intake. Their sound was very pristine and detailed, but even sound of this caliber is tending to get lost at shows where the overall quality of sound is increasing every year.

Distributor Sonic Research was showing off the Audio Pro Ace Plus system, a duo of diminutive loudspeakers and a special driving amplifier. The speakers—the A2-1 and A2-2—are slightly different sizes, the larger being only 8" high by 5½" wide, yet the combination is claimed to extend down to 50Hz (for the larger speaker). And if it doesn't, Audio Pro also makes a powered subwoofer. The special amplifier also has a volume control and three line-level inputs. Priced at $8700 for the smaller A2-1 and $1200 for the A2-2, including amplifier.

As if there weren't already enough mini-speakers around, turntable manufacturer SOTA has joined the fray with their $1300/pair Panorama unit. Designed by VMPS's Brian Cheney and using VMPS-made parts, the Panorama's enclosure utilizes the materials and technology developed by SOTA for use in their highly rated turntables. The low-end limit is cited as 41Hz.

Conventional wisdom has long held that, while electrostatics make fine upper-range speakers, they are ill-suited to serve as woofers. Sound Lab is out to disprove this with their B-1 subwoofer system. (See also Dick Olsher's reports on the state of the electrostatic art elsewhere in this issue.) This is a big, flat radiator screen, a pair of which is intended for placement between a pair of the firm's top-of-the-line A-1 curved-screen full-range electrostatic units. Each panel measures 81" high by 44" wide, and comes in a choice of configurations: the B-1 for paired use, and the B-1S (Stereo) for single-panel use. The S version contains electrically separate woofer panels, allowing each stereo channel to drive its own panel without the need for A+B summing. Both versions use a unique dual-diaphragm system wherein a sandwich of two paralleled diaphragm and stator grids are separately driven, in order to increase both displacement amplitude and immunity to the effects of acoustical coupling resistance. They are priced at $10,500 per B-1 pair, or $5500 for a single B-1S. (They are, presumably, cheaper if you buy six at a time.) Smaller models to match the height of the A-3 will be available soon. Sound Labs' demo was extremely bass-heavy until the last show day, when they obtained a crossover network that allowed the woofer to be tuned down to match the upper-range speakers. After that, the system sounded superb.

TDL's exhibit shared the honors with Sound Lab, VMPS, and Tandberg for my best sound at the show, with a pair of their top-of-the-line Reference Standard Transmission-Line monitor speakers. Despite a runaway low end, which I blamed on the room, these big 4-way 7-driver systems ($6995/pair) had a very natural midrange, and highs that ranged from silky sweet
Infinity's IRS Beta loudspeakers in the Counterpoint room were one of JA's "Best Sound at CES" nominees (Manufacturer's photograph)

to cuttingly sharp—as demanded by the program material. The tweeter is a version of the aluminum-dome unit that so impressed JA in the Monitor Audio R952/MD in Vol.11 No.1. TDL is, by the way, the current incarnation of what used to be IMF, with engineer John Wright, responsible for the classic IMF designs, still at the wheel. This was their first appearance at a CES.

True Image, a small company whose dedication to real music is apparent from their choice of demo material, was showing a TIP-1500 MOSFET monoblock power amp (150 Wpc, $3450/pair) and TIP-2 dual-mono preamp ($1950). Their sound has varied markedly from show to show, but it was very good this year, despite the fact that their own small speakers always seem inadequate for showing what their electronics are capable of.

VMPS was demoing an improved version of their huge (8'-high) Super Tower, which now boasts four inverted-dome tweeters (two were used in the previous model). The sound here was, simply, stupendous—one of the four best-sounding demos I heard at the show. (The speaker goes for $3875/pair.) VMPS president Brian Cheney was also using a custom-built (by John Curl) heavy-duty power supply for Threshold's FET-10 preamplifier which I rashly declared in a recent review to be the state-of-the-art preamplifier. The improvement in sound was substantial, but at $500 per supply, with four needed for a complete FET-10 set, that power supply is hardly what one would be tempted to call cost-effective. John C, if you can build one of these with four regulated outputs and price it at $500, you'll sell a lot of them. That is, unless Threshold swallows its battered pride and offers something like it first.

Wilson Audio was giving impressive demonstrations (with, among other things, the garage-door track from HFN/RR's test record) of their new subwoofer, the WHOW, which stands for Wilson High-Output Woofer. It consists of an 18" CTS driver, mounted downward-facing in a coffee-table commode made of the same composite epoxy material used for the WATT enclosures. The WHOW is driven by an electronic crossover and a built-in Krell 100W power amp. Dual inputs are provided, so you can sum the bass inputs or use a pair of WHOWs for stereo. Total weight of the amplifier/commode unit: 275 lbs! No firm price has been set, but the WHOW is expected to come in at between $7500 and $10,000.

Exotic Cables

Absolute Reference Audio Labs, an Australian firm with a California address, was showing their line of EMF/OF1 cables. EMF is Electro-Motive Force, and OF1 stands for Open-Field Theory, which somehow relates to the effect of a dielectric on signal transmission speed. ARAL's explanation of how their cables work is not much less nonsensical than that of anyone else in their field, but then that doesn't matter anyway. What matters is how it sounds, and we are assured that theirs sounds better than anyone else's. Perhaps DO can get some samples of ARAL product for his current round of cable tests. ARAL also makes an Apogee brand of cobalt-doped ferric cassette tape. Jason Bloom, take note.

4 They play the kind of stuff a music lover likes to when he isn't showing off his system.

5 Not to be confused with the Smetana opera.
Surround-Sound Processors

Fosgate’s demo was simply stupendous! Featuring a vast room, a Barco video projection system, seven KEF speakers (three 107s in front, four 103s at sides and rear), and Fosgate’s surround-sound processors, some scenes from recent blockbuster films had all the impact of a first-run presentation in a well-equipped theater. People in the “audience” booed when some of the short demo segments were terminated. A roving switcher allowed one to choose between four processors: Fosgate’s 3602, 3603, 3604, a prototype unit with discrete FETs throughout, and the Shure HTS. I couldn’t hear any qualitative differences, but there was no question that switching in the Shure narrowed the front stereo field, in comparison with any of the Fosgate units.

Although they couldn’t compete with Fosgate’s demos for sheer visceral excitement, Lexicon Inc. attracted a lot of attention with an impressive presentation of their first consumer product, the CP-1, which combines the functions of a Dolby surround decoder (like the Fosgate and Shure units) and an ambience synthesizer (like the Yamaha DSP-1). It has an A/D converter at the input and a DAC at the output, and all Dolby Pro Logic decoding and synthesizing functions are performed in the digital domain. The unit is fully controllable by an infra-red remote unit supplied with it. I’ve never heard the Yamaha working properly, so I couldn’t make comparisons, but the CP-1 did a remarkable job of simulating acoustical spaces of different sizes and reverberant characteristics. The large-hall reverb was particularly impressive, differing from the real thing only in that it was too perfect, having a smoother and more even decay than any real-world performing space. The Dolby Surround decoding uses one unusual and one unique feature, respectively: automatic channel balancing and automatic phase correction. Both conditions must be met in order to achieve maximum rear-channel cancellation of front-channel dialog in Dolby-encoded films. Demonstrated with 7 speakers including a front Dialog speaker — it can be used with as little as two — front/rear separation from the CP-1 appeared to be total, but then I have heard similarly excellent separation from other surround systems, when properly adjusted. But as the Lexicon spokesman pointed out, most people don’t bother to adjust them. In a contest between a CP-1 and a maladjusted Fosgate, the former would most certainly deliver better front/back separation, but I’d be willing to take a sizable bet that the kind of people who can’t be bothered making that simple front-panel adjustment will never notice the difference. If they did, they’d adjust for it. At $1200, the CP-1 is more expensive than other Dolby Surround decoders, but is competitive with the Yamaha DSP-1, whose Dolby Surround processing is rather more rudimentary. Incidentally, the CP-1 is unique among Dolby-licensed decoders in that it has

My feeling about that is they deserve what they get! But then, in a society that gives million-dollar awards to people who stick their hands into running lawn mowers, everyone must be responsible to the consumer except himself. This gives new meaning to the term “idiot-proof.”
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a full-range rear channel—something Dolby has never before allowed any licensee to do because it makes rear-channel leakage of dialog sound so obnoxious. (The licensing agreement specifies a 7kHz cutoff in the rear channels.) Lexicon managed to persuade Dolby Labs that their auto-balance/auto-phase obviated the need for the rear-channel HF restriction.

An outfit called Synergex introduced a Model ESP-7R which also offers some interesting features. Two, which are related, are the use of automatic input balancing to maintain front-rear dialog separation, and a wide-range rear channel—presumably also with the blessing of Dolby Labs. Synergex also goes a step beyond the basic Dolby surround system by using stereo rear channels. Although the encoded rear information is always mono, front L and R stereo signals also appear at the rear, and can impair apparent front separation if reproduced in mono from the back. (Fosgate gets around this by operating the rear channels out of phase with each other.) The ESP-7R lists for $675.

Gadgets and Accessories
The Paulson Isolator is a unique vibration-isolation base for phono units, CD players, or whatever. It uses a magnetic-repulsion suspension rather than springs. I'm not sure what advantage this confers, but I'm thinking about it. Available in several sizes and weight capacities, prices for the PIs start at $70.

Threshold was showing prototypes of what they call the Black Hole, which was described as an active version of the remarkable ASC Tube Traps. Each is a tall, circular column containing, at top and bottom, a 12" cone loudspeaker with a small omnidirectional microphone right in front of it. The microphone feeds an amplifier which in turn feeds the speaker in reverse phase, thus acting to cancel the air-pressure variations at the microphone. I heard a demo of them, in conjunction with a pair of Martin Logan CLS speakers, and while they certainly improved the sound, they weren't doing what ASC's Tube Traps are supposed to do. Instead, they were increasing the low-end contribution from the speakers—certainly not an undesirable result, but inconsistent with the avowed purpose of the devices. (Actually, the small-panel CLS has virtually no output in the range where standing waves would occur in a room as large as Threshold's demo space.)

Video
Projection-monitor manufacturer Barco was sharing a small auditorium with Fosgate, together creating what again I must describe as the most exciting demonstration at the entire show. Barco's "bottom-of-the-line" Barcovision 400 projector was throwing an amazingly bright picture onto a 10'-diagonal flat screen, with the cleanest, sharpest, highest-contrast projected image I have ever seen. Except for the clearly visible scanning lines, it could easily have passed for 16mm film! It's list-priced at $6950, without the screen.

For the third year in a row, the most important introduction at CES was not an audio but a video device. RCA was giving regularly scheduled presentations (at the convention center) of their proposed high-definition video system, whose major attraction, it would seem, is compatibility with our existing 30-year-old NTSC system. Based on experimental evidence that we do not see moving objects sharply, RCA's system concentrates on providing high definition for those parts of the image which are stationary, like the background. This way, once the background details are filled in, they can be ignored (while being replenished during successive scans from the receiver's digital memory) until or unless the background scene changes. Thus, without the constant need to receive image details for every frame, those details can be transmitted within a narrower signal bandwidth. Existing TV receivers will see only the middle of the transmitted image, with "normal" definition, while viewers with HDTV receivers will get the added picture definition in a Cinemascope-style wide-screen format. The demoed HDTV images looked very good, but I'm not sure I care for the basic idea. When HDTV comes, I would prefer that it be as simple and uncompromised as possible; if that means incompatibility with the existing NTSC system, so be it. We've been hamstrung by that long-outmoded system for entirely too long already.

7 ASC Tube Traps are passive, hollow cylinders with semipermeable walls which convert strong air-pressure changes into heat. To date, they are the only known retrofit treatment for LF standing-wave problems.

8 Scanning lines are a part of the NTSC video image; the sharper the picture, the more clearly visible they become.
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Dick Olsher assesses the State of the Art (in electrostatic loudspeakers)

Amid the glitter, hype, and hoopla of the 1988 Las Vegas CES, the fortunes of the electrostatic transducer never looked brighter. With the exception of Quad, all the major electrostatic manufacturers were represented: Stax, Acoustat, Sound Lab, Martin-Logan, and California Audio Technology (Beveridge). And generally speaking, these companies' suites and others where electrostatics were utilized represented sonic oases in an otherwise arid landscape. Of course, there were other noteworthy speakers, but it was my impression that, viewed as a family group, the electrostatics dominated the high-end scene.

Besides listening, I also spent time discussing the art and the technology with some of the key figures in the electrostatic field: Roger West of Sound Lab, Jim Strickland of Acoustat, and Harold Beveridge of California Audio Technology. It was fascinating to get a glimpse of the evolution of the art through diverse eyes...
and minds. It became quite obvious that there were significant individual differences, both in how the basic technical problems of the medium were being resolved, and in the direction of future research and development. This I found surprising, having assumed rather simplistically that a consensus of technical opinion was likely in a high-tech arena and would therefore cause designs to converge toward a common ground—at least in the cost-no-object designs. What follows, then, is an assessment of where the technology is at right now and what future directions it might take.

Why Electrostatics?
At the risk of repeating the obvious, I would like to highlight the unique advantages of the electrostatic transducer over competing approaches, which help define its excellent sonic signature. First, there is the very low moving mass of the diaphragm. Thank God and Du Pont for Mylar. This familiar plastic possesses high tensile strength and is commonly available in thicknesses of 0.4 mil (that's 0.4 thousands of an inch), although some manufacturers use even thinner Mylar. For example, Sound Lab routinely uses 0.2 mil Mylar. A 1m² sheet of this stuff only weighs about 4.5 grams! This is considerably lighter than the weight of a woofer or midrange cone, or even that of a Magneplanar-type diaphragm where a wire voice-coil is attached to Mylar sheets. Of course, low moving mass in itself is not sufficient to explain the electrostatic's excellent transient response. We have known since Newton's days that acceleration is a function of applied force to mass, so that the same acceleration can be obtained for a transducer twice as massive, provided that the driving force is doubled. Electromagnetic force is not cheaply come by, however, and for a given force, the lighter the diaphragm, the more sensitive the design.

The real key is the use of uniform drive force. The electrostatic diaphragm is driven essentially over its entire area, while the competition is not. The cone of a moving-coil drive-unit is driven at the apex, and since it is not infinitely rigid, it will slightly deform nonlinearly and produce harmonic distortion as the driving-force impulse travels to the rim. And because it takes a finite time for the impulse to reach the rim, there's a delay in the starting and stopping of the cone. The end result is that the acoustic signal does not faithfully follow the electric drive signal. The attack or leading edge of transients is blunted and the subsequent transient is blurred because of cone overshoot.

Even some other types of planars do not exhibit the same uniformity of driving force because only part of the diaphragm is actively driven. Examples would be the use of distributed wire or metal-strip voice-coils.

So at their best, electrostatics are capable of great speed and transient control, excellent resolution of low-level detail, and remarkable transparency. But there's no such thing as a free lunch: there's a goodly measure of problems and challenges attendant to any technology, and the electrostatic loudspeaker is no exception. So let's take a look at these problems and the various solutions offered by the industry.

Push-Pull & Constant-Charge Operation
Any audiophile worth his salt recognizes push-pull operation as a desirable attribute; it is easy to achieve in an ESL design, as shown in fig.1 in highly simplified schematic fashion. But push-pull alone is not enough to linearize the forces acting on the diaphragm. Peter Walker of Quad pointed out in the early '50s that what is also required is constant-charge operation. The diaphragm and grids of an ESL approximate a large parallel-plate capacitor. Therefore, the charge, Q, on the diaphragm can be represented by the well-known equation \( Q = CV \), where \( C \) is the capacitance and \( V \) is the audio voltage applied to the grids (as in fig.1A). The charge is seen then to be a function of the voltage and will rise and fall in response to the stepped-up audio signal.

The rate at which the charge varies is determined by the RC time constant of the system, where \( R \) is the resistance of the grid and \( C \) is the inter-electrode capacitance. If the RC time constant is on the order of the period of the audio signal, the charge on the diaphragm will not be constant while it is being pushed and pulled out of its rest position.

Why is this bad? It can be shown that when the charge on the diaphragm varies, the electrostatic forces acting on the diaphragm are not constant but, rather, position-dependent. Once the diaphragm is displaced toward one grid, the push and pull forces are no longer equal and the possibility of serious harmonic distortion exists.
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Constant-charge operation is normally achieved by applying a high-resistivity coating to the diaphragm in order to increase its resistance and thus the time constant. If we examine the audio bandwidth, from 20Hz to 20kHz, the longest period is that of a 20Hz signal: 0.05 second, or 50ms. A time constant of about 0.5s, an order of magnitude higher, would effectively ensure constant-charge operation.

You would think that by now every ESL would be designed for constant-charge operation, but that is not the case. I know of one major exception: the Beveridge ESL. But before you scoff at such an approach, I should tell you that there are rational and valid reasons for it. A careful examination of fig.1B will reveal that for direct-drive purposes, the required drive-voltage swing would only be half that of a constant-charge design. Rather then swing from -V to +V, the direct-drive amp would only be required to produce swings from ground potential to -V or +V. And, in fact, the latest system from Beveridge, the Model 6, does employ direct-drive.

In addition, the fact that the Beveridge systems are hybrids, with fairly high crossover points, makes a significant difference. For example, the Model 6 crosses over to the electrostatic panel at 400Hz, at which frequency the displacement of the diaphragm from its rest position is small enough that the push/pull forces on it remain substantially symmetrical despite the lack of constant charge. So in retrospect we might conclude that, as long as one is willing to restrict diaphragm displacements to positions not far away from its rest position, a low-resistivity diaphragm such as aluminized Mylar would be a viable design option.

**Dispersion**

Full-range ESLs have struggled for years with the problem of achieving broad dispersion throughout the upper octaves. Highly directive, beamy highs were commonplace in the old ESLs, severely restricting the extent of the listening seat. Personally, I do not find this to be a significant limitation. With my old Quad ESLs or the Audiostatic ES-240s, I’ve got the sweet spot carefully delineated and I simply flop down and stay put. I am aware, however, that many audiophiles are paranoid about being confined to a midget-sized audio seat that does not allow more than a few inches of movement and would welcome greater freedom of choice in this regard. A variety of innovative solutions to this problem have been sought and successfully implemented. Before taking a look at these, we should first examine the root cause of the problem which will give a better appreciation of the technological fixes.

Physically, directivity is dependent on the dimensions of the radiating surface. Whenever the radiated wavelength approaches the dimensions of the transducer, the acoustic output becomes beamy. The average dimension of a large electrostatic panel can be several feet,
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which means that the output from such a panel starts to beam in the midrange. A simple solution is to design a two-way with a small electrostatic tweeter and a much larger electrostatic woofer. This reduces the dimensions of the treble radiator and thus improves the dispersion of the upper octaves. The price is having to use a crossover and thus losing some of the phase linearity inherent in a true full-range design.

Quad’s strategy, as implemented in the ESL-63, was to use an annular diaphragm in which each ring is time-delayed in such a way as to simulate the dispersion pattern of a point source. Martin-Logan’s approach was to develop a curved diaphragm/grid assembly which is utilized in all of their models. The problem with this approach is that the tension on the diaphragm is not the same during forward and rearward excursions. It’s fine to pull the diaphragm outward, but it tends to collapse when going inward, which puts a limit on the excursion capability and ultimately the dynamic range of such a design. The early CLSs, for example, did not appreciate any bass transients and would become incontinent until the diaphragm settled down.

Sound Lab, on the other hand, approximates a curved diaphragm by using a mosaic of small transducers. Roger West calls these facets, and the more facets are used, the more closely a curved array can be approximated. This design is presently used in Sound Lab’s models A-1, A-3, and A-6. The first-generation designs along these lines were guilty of the venetian-blind or picket-fence effect. This refers to acoustic interference between adjoining facets, producing alternating regions of high and low sound-pressure levels along the face of the array. This problem has been completely solved by Sound Lab by positioning the facets much closer to each other than before; to within $1/2\pi$, in fact.

Finally, Acoustat tackled the problem in a unique and fresh way indeed. Both the Spectra 22 and 33 full-range ESLs incorporate the MK-2123 interface that provides the means to control the acoustic geometry of the diaphragm as a function of frequency. Acoustat has dubbed this “Variable-Geometry” array operation. Physically, the Acoustat panels are flat, but except for one segment that is driven full-range, all other segments are electrically driven with progressive frequency rolloff from the middle to the sides (but not up and down) of the diaphragm. This results in a horizontal dispersion contour that resembles that from a point source because the size of the radiating area decreases with frequency. By judicious choice of sector drive and physical location on the panel, Acoustat is also able to create asymmetry in both the effective shape of the array as well as room dispersion in the midrange—presumably to minimize room effects and to broaden the stereo seat.

Strictly speaking, curved full-range transducers are only capable of enhancing horizontal dispersion; they do nothing for vertical dispersion. But if the height dimension is sufficiently extended, we end up with a line-source configuration (where interference of the direct wave with its reflections from floor and ceiling lead to a cylindrical wavefront) and the issue of vertical dispersion becomes moot—at least in terms of the listening seat. This is because unless you’re over 12 feet tall, ear level is never above the line source. For a line source, vertical dispersion is negligible at least out to the very far field because the wave launch in the vertical dimension is almost planar. As a direct result, the sound-pressure intensity falls off only by a factor of two for each doubling of distance from the speaker instead of the typical factor of four for a point source. This is beneficial in terms of the listening seat because the off-axis listener still gets a reasonable illusion of soundstage width without being overwhelmed by the intensity of the closer speaker.

Roger West talks about a critical distance at which the intensity of a point source equals that of a line source and beyond which the line source is always louder. Roger even has a simple rule of thumb for calculating this critical distance: the critical distance in feet is roughly equal to twice the difference in sensitivity ratings (dB at 1 meter) of the point and line sources for differences up to 7dB. The important point to remember is that if you’re far enough removed from the speaker, a low-sensitivity line source may actually be louder than a higher-sensitivity point source. This, however, is only true to a distance equal to about five times the average dimension of the line source. Beyond this distance the line source will measure like a point source. If you get far enough away from an object—no matter how large—it will eventually look like a point. Our own sun and the stars in the sky are
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good examples of this.

I cannot leave the subject of dispersion without addressing the issue of dipole radiation pattern. There has been more drivel written about this topic than any other aspect of ESLs. As a result, many audiophiles have swallowed the myth that a dipole radiation pattern is bad and that therefore ESLs are more room-sensitive than, say, a dynamic speaker. Balderdash! Consider a line-source dipole and its figure-eight radiation pattern. There is very little energy radiated to the sides; sidewall reflections are minimized. The negligible vertical dispersion of the line source elicits very few floor and ceiling reflections. So here we have a speaker that produces very little in the way of early room reflections. It is the early reflections, arriving at the ear within 10ms of the direct sound, that are most critical in coloring the sound. Here, to my way of thinking, is a speaker that is much less room-sensitive than the average dynamic speaker.

What about the back wall, you ask? Well, of course you can't place the ESL close to the back wall; in general, treatment of the back wall is necessary to control the so-called comb-filter effects. But any good listening room should have at least a modicum of acoustical treatment. This is not to imply that ESLs are completely immune from room reflections. Certainly they are not. Because the ESL diaphragm is so light and lacking in stiffness, it is easily modulated by significant bass energy in the room or serious room standing waves. This, however, impacts ESL bass quality more than any other aspect; more about which in a little while.

**ESL Bass & Subwoofers**

Bass extension and quality have traditionally been the most troublesome performance areas of ESLs. To achieve deep and potent bass in a full-range ES design means wide diaphragm/grid spacings to allow for greater diaphragm excursions, better and beefier step-up transformers, and a much larger radiator area to push the front-to-back dipole cancellation lower in frequency. Unfortunately, wider electrode spacings reduce sensitivity and there are limits in terms of cost and size beyond which even an ultra-audiophile would not venture. Furthermore, bass-heavy program material may cause ionization of the air between the electrodes, with a resultant audible cracking or discharge noise.

It is no wonder, then, that some manufacturers (eg, Quad) simply ignore the issue, while others like Beveridge have long ago given up the idea and are strictly exploring the notion of a hybrid. Martin-Logan, at least in their state-of-the-art efforts, and partly because of the limitations of a curved transducer, have resorted to hybrids with cone woofers operating below about 100Hz. Acoustat appears to be sitting on the fence, at least for the time being. Their Spectra 22 and 33 both incorporate a defeatable 100Hz passive crossover that allows for the addition of a subwoofer or full-range operation as desired by the user.

Sound Lab, on the other hand, views hybrids as a cost-effective compromise and appears to be the only manufacturer on the face of the earth that is pushing forward the frontiers of ES bass technology. Their patent-pending distributed bass resonance principle is claimed to virtually eliminate two major drawbacks of low-frequency dipole drivers: diaphragm resonance and dipole cancellation. Unless controlled, the diaphragm resonance can give rise to a large bass peak that not only colors the sound but also limits the usable dynamic range of the speaker. The traditional solution is to resistively dampen the resonance by the application of foam, etc. Roger West's idea was to redirect this resonant energy in a useful direction. The diaphragm is divided into sectors, from the top on down. The size of each sector increases and its associated resonant frequency decreases in a staggered fashion from 250Hz down to 30Hz. The end result is a diaphragm with a series of smaller resonances adjusted such that they acoustically compensate for the dipole cancellation. Thus, deeper and better-controlled bass is possible.

Having heard the bass response of the new A-1s, I can testify to the fact that bass extension and punch are quite impressive and should satisfy almost anyone, with the possible exception of the true bass freak. (This is the kind of guy into cannon shots, aircraft takeoffs, or helicopters in the living room.) Well, if you're that kind of guy, there's finally ES relief for you. Sound Lab officially introduced two large ES subwoofers at Las Vegas, the B-1 and B-1S. These models were developed primarily for use with the models A-1 and A-3, but are, of course, suitable for augmenting the bass response of many other high-end speakers. The
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B-1 is to be used in pairs, while the B-1S consists of two separate drivers mounted in a single frame the size of one B-1. Both models naturally use Sound Lab's technique of distributed bass resonance and a double-diaphragm design developed some 17 years ago by Koss. Since the two diaphragms work in parallel, or tandem, the woofer's efficiency and volumetric displacement are increased. But more importantly, because the transducer is now acoustically stiffer, it is less susceptible to modulation by room reflections and room placement is more tolerant of room boundaries. Frequency range is claimed to be 22Hz to 350Hz and the input sensitivity is a respectable 86dB (1W/1m).

Price? If you have to ask you can't afford them.

In the Sound Lab suite, a pair of B-1s was positioned directly between and buttressed against the sides of a pair of A-1s, so as to provide a wall of sound about 12 feet wide. Such a configuration lowers the dipole cancellation frequency and increases the system's resistive coupling to air in the bass because of the gigantic overall radiating area. The bass heft and impact of this system were astounding, and the leading edge of bass transients was so quick as to be scary. When I heard the B-1s, the balance was a bit bass-heavy, but the biggest problem was the room. You guessed it, it was on the smallish side, with cardboard walls. The bass output of these gargantuans simply overloaded the whole structure so that every heavy bass transient was followed by a wash of mud which went away as the room recovered from the shock. Even under these circumstances, I'm quite willing to consider what I heard as state-of-the-art bass reproduction.

Electrostatic Headphones
Stax demonstrated the new Lambda Signature system, with the thinnest membrane yet. Would you believe Ium (surpassing the 1.5um of the Lambda Pro)! The system retails for $1900 and includes a direct-drive hybrid amplifier with a FET front end and a 6CG7 dual-triode output stage.

Listening to the Signature system with the Quattro CD player spinning a couple of Stax's binaurally recorded CDs proved most enjoyable. There was Helga whispering in my left ear and Gunther walking around my head. Despite being provoked by these apparitions, I really did enjoy the sound quality and tonal balance, more so than from any other headphones I can recall. A key ingredient in securing that natural tonal balance was the ED-1 Diffuse Field Equalizer ($799 retail). The ED-1 is manufactured by Stax under license from the German IRT (Institut fur Rundfunktechnik).

In a nutshell, the basic idea of this equalizer is to obtain an in-ear headphone response that approximates the in-ear response from a pair of loudspeakers in a diffuse room environment. Small probe microphones were inserted into the ears of willing subjects and their in-ear responses to loudspeakers in a diffuse room were measured. The measurements were then repeated with headphones using the same program material. The results in general showed a large dip in the headphone response between 2 and 4kHz. The ED-1 is optimized for the Stax Lambda and corrects for this suckout.

If you want more details, there is a long paper about this technology in the December 1987 issue of the JAES.

The equalizer is supposed to work equally well for ordinary stereo as well as binaural or dummy-head program material. I'm not sure why you need it for binaural recordings, but in the Stax demo using the binaurally recorded CDs the balance was much more natural with the equalizer in. Clarity was not really an issue with it in or out. The complete system strikes me as clearly on-top-of-the-art.

The Shape Of Things To Come
Where do we go from here, and what about direct-drive? Acoustat's Jim Strickland is not too keen on the idea of direct-drive, something that surprised me considering Acoustat's early history. This is not so much from the viewpoint of reliability, he told me, but he really does not feel it is necessary with Acoustat's latest interface technology. Apparently, both Beveridge and West feel differently, however, and view the step-up transformer as a liability. Beveridge is already using a direct-drive amplifier with the Model 6 and Roger West has some innovative direct-drive ideas up his sleeve. Another possibility is more widespread use of multiple-diaphragm drivers. The trade-off here is more complexity for better efficiency and bass response. Finally, something Roger West told me should appeal to all of us, and that has to do with cost—finding ways to bring the cost of ESL technology down to the point that folks like me, driving around in beat-up VWs, can afford the darn things!

Stereophile, March 1988
In less than a decade, high-performance cable has emerged as a critical component in any quality audio system. Since the early-1980s, MIT has been the acknowledged leader in superior audio cable. This audible superiority results directly from leading-edge computer design capability, rigorous testing and a unique understanding of the physics of cable performance.

MIT cable delivers neutrality, clarity and precise focus because it is designed to virtually eliminate "phase noise". Phase noise includes all forms of frequency and phase instability, and is an inevitable by-product of audio cable that is not phase correct. In fact, all other audio cables suffer significantly from phase noise. Only MIT cable is designed to be truly time aligned, phase coherent and thus, noise free. The result: MIT cable does not alter the sound as do other audio cables.

In a dramatic comparison of MIT's superiority, MIT ran head-to-head tests of one-meter lengths of MIT MI-330 vs. solid-core straight wire, employing a sequence of music tone bursts. Despite past regard for straight wire, and some observers actually recommending its direct application in audio cable, comparable lengths of straight wire simply cannot compete with MIT cable on crucial phase noise performance.

These test graphs, which illustrate only one of a series of music tone bursts, provide visual proof of MI-330's overwhelming phase noise superiority. From the instant each music tone is retriggered, MI-330's defined transmission is obvious. Equally important is what occurs before each music tone starts. This brief but critical time segment (to the left of the arrow in the exploded view) is supposed to be absolutely quiet.
Note that MI-330 is essentially quiet just before each music tone starts, as any audio cable must be for sonic accuracy. The length of solid-core straight wire, like other cables which are not phase correct, is noisy when it should be quiet. It is victimized by phase noise—stored energy which overrides and literally destroys quiet passages. Simply, true quiet passages cannot survive through incorrectly designed cable!

By comparison, MI-330's quiet passages and clearly defined wave form mean that the music starts and stops exactly when it is supposed to, yielding a more holographic sound stage, intertransient silence and minimal distortion.

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Editor's Introduction: One of the big industry stories of 1985 was the split, both personal and commercial, between the British Linn and Naim companies. Led by Ivor Tiefenbrun and Julian Vereker respectively, both companies had started up in the early '70s. Both men held similar views, both about the fat-cat complacency of British designers (which had led to a grievous sound-quality slump in the mid '70s), and about the system rethinking necessary for what some writers, unaware of the rigors of thought required by followers of that spiritual descendant of Fowler, William Safire, would term a "quantum leap" forward in sound reproduction.1

With that essential journalistic attribute, 20/20 hindsight, it is now obvious that when Julian and Ivor joined forces, they would indeed shotgun first the UK and then the rest of the world—even the US—into a brave new world of turntable-quality-above-all system matching. The US launch at the '86 SCES of a Linn-brand range of amplification, doing away with the need for the Scottish company to associate their front-end components and loudspeakers with Naim solid-state amplifiers, therefore had considerable impact—not least on the company that had hitherto distributed the products from both companies in the USA, Audiophile Systems of Indianapolis. One could make a good case that the new Linn electronics, being remote-control-ready and convenience-oriented, did not present the more hair-shirt Naim components with direct competition. Nevertheless, AS decided to concentrate on Linn products, leaving Naim at first apparently in the wilderness.

Ken Kessler met with Julian Vereker late last Summer and, among other things, asked him to what extent the parting of the ways with Linn had instigated the setting-up of their own US operation.

—JA

1 The word "quantum" in itself only means "discrete" or "non-continuous." It does not, as is so often implied, mean a large change or improvement.
JV: It was certainly a catalyst. I wouldn’t say we had it in mind to change distributors, because once you make a commitment to support a distributor, part of their livelihood depends on that. The last thing any responsible manufacturer should do is to pull out, especially after 10 years. It wouldn’t have ever come as our suggestion. However, the sales people at Audiophile Systems clearly found it difficult dealing with what they perceived to be two competitive lines. So, very amicably, Audiophile suggested that we find an alternative distributor.

We did, in fact, have a look at several of the alternatives, but—being realistic about it—with the sort of operation that we feel that it’s necessary to do in the States, there wouldn’t have been enough money for another distributor to take on our line and deal with it as a sole line without having competing products. There are difficulties from the financial point of view—I don’t think anybody actually realizes how much proper distribution costs. One of the main things that we feel is important is to offer a really good, quick, efficient back-up for customers who have bought equipment, as well as advice on the phone at any time with someone who knows the equipment inside out and knows how to use it best. Service is all—it’s the most important thing. Someone spends a lot of money on a piece of equipment, they want to know that there is somebody there who is going to honor the guarantee should anything go wrong, and give advice, and it’s going to be good and accurate; it’s a matter of confidence.

In order to do that, we set up a plan of what we needed to do. We felt that it was important to have a technical person there on-site with a fully equipped workshop to be able to repair any of the equipment that we make.

**KK:** But doesn’t any good distributor do that as a matter of course?

**JV:** Not as a matter of course if one looks elsewhere in the world. Looking worldwide, there are a few of our distributors who do have some repair facilities, but the majority of our distributors return failed printed-circuit boards to us in England and all they do is change dead boards. Audiophile was the exception; they had a guy who had been over to our factory several times and was pretty familiar with the equipment, but it’s not quite the same as somebody who’s actually helped with developing the test procedures at Naim.

In fact, the technician at Naim North America was at Naim in the UK for five years, went out to Chicago for six months, met a nice American girl, and has subsequently gotten married, so I reckon he’s there for good. That shows a whole commitment to the US. It has to be very strong and long-term to guarantee his future. We have daily contact with Naim US and the people who work there; if there’s any query, they know exactly who to call, and do it without even a second thought. We have a computer link between Chicago and Salisbury; every day we look in the machine in the States, or whichever end I’m in, and see what the problems are. There’ll be messages on a diary system we have. Any problems, and we can ship stuff out immediately, work out what stocks they need—all that happens every day. What we’re trying to do with Naim in the US is to make it every bit as good as if it were native product.

We’re one of the largest-selling high-end manufacturers in the UK. We actually ship over a million pounds’ worth (US$1.8 million) of electronics into the UK market each year—that’s at trade price and no tax, so it’s a lot more by the time the customer buys it. The number of super letters and calls we get after something has been straightened out—well, the same thing is beginning to happen in the States. It’s very, very rare that there’s a problem which lasts more than 24 hours, where the customer is not happy with what’s gone on and we’ve not been able to get a dealer or one of our people to him. If there’s a problem with a customer in the US, one of our sales people will actually go and visit as soon as it is humanly possible. Obviously there’s a little bit of how big a customer is; if it’s a NAIT integrated amplifier, he’s unlikely to have a visit the following day if he’s 4000 miles away. If it was a Six-Pack owner, then it’s very likely that someone would fly out that day and say, “Right, we have to get this problem licked.”

**KK:** Is it safe to say that, despite the events which led up to Naim parting with Audiophile Systems, the parting was amicable?

**JV:** Entirely. Although it was not of our choosing at all, they still carried on looking after our US dealers until we actually had a chance to get ourselves set up in the States. In fact, it was one of the most amazing pleasures of all time to arrive in Chicago on a Monday afternoon.
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and, during the week that followed, find ourselves premises, a bank, a lawyer, order a computer—we were even able to find some time for shopping. The whole thing took four days—we left on a Friday evening and everything was done. To do that from the UK would have been impossible. From that moment on we worked really hard to get all the systems in, get all the stock arranged. Audiophile honored all their obligations as far as warranties were concerned, provided us with all the warranty cards so that we were able to contact every customer who'd ever filled in a warranty card over the past 10 or 12 years of Naim being in the US, and although it was, as I say, not of our choosing, it was as amicable and honorable and straightforward a changeover as two companies have managed.

I'm not even sure, compared with some of the other distributors who also decided to stick with just Linn, whether it was entirely of the distributor's choosing. I have a feeling that they were put in a situation where they needed to make that choice because of Linn's plans on expanding to a much wider market, and they needed therefore to gear themselves in a way differently from our ideas of the ways in which our range will expand in a definite state-of-the-art direction, particularly with speakers.

I personally cannot see any reason at all for anybody—any distributor—to have dropped either. When Audiophile first knew about the Linn electronics, they said, "Right, OK, this is quite simple. We agree because Linn says this is the state-of-the-art amplifier, this is better or as good as the best Naim makes at half the money. Therefore, there is going to be a conflict." My own view was that there would be no conflict at all.

First of all, the Linn amplifier doesn't fulfill the same sort of design aim that Naim equipment does. It doesn't have an upgrade path. It's a one-product range. It has such a difference in ergonomics that either people will go for the pushbutton thing and want the remote; in which case there's no good buying a Naim, or they won't. There isn't a problem there at all.

**KK:** *In the past—at least in the UK—all Naim dealers were Linn dealers, though not vice versa. How has the end of the collaboration affected you in this area?*

**JV:** We actually have several dealers now who don't stock Linn; that never happened before. But this is also because there have been one or two other turntables which have appeared.

The real problem (in our more naive view in the past, when we were collaborating) was that it was a Linn front end, a Naim middle, and a Linn back end. Now the minute you take away the Linn back end, then your option on turntables increases: due to the frequency response of Linn speakers, they draw attention to the faults in other turntables and ameliorate the faults in their own turntable. It was a system. The electronics actually don't enter into it. Our electronics, in any system you put them in, always improved them in the ways which were important to me in musical terms. Not necessarily in your terms of the presentation of the sound and the space and these sorts of things, but in musical terms—the tune and the intentions of the composer, the skill of the people who are performing. ² It doesn't matter what the system is.

What has happened in the UK is that there have been a few dealers who have decided that they've preferred the Linn electronics and our sales have been reduced with them a bit. By the same token there have been dealers who have maybe not sold a single piece of Linn electronics at all. That has happened with some of our largest dealers in the UK. The real problem area is when you have a whole lot of committed people in the same store and half of them prefer the Linn and the other half the Naim; they fight and the sales of both fall. Since our sales in the last quarter in the UK are up some 40%, and overall last year were up 23%, it hasn't hit sales too badly.

**KK:** *What are your relations with Linn now? I get the impression that most people think you burn effigies of each other.*

**JV:** No, that's not true. We still talk, but you have to bear in mind that we don't discuss the things we would have discussed before, and that the relationship is unlikely to open up. However, we did spend a lot of years having a really good time together, building our companies together, and now it's like an amicable divorce. We've done the 18 months of feeling aggravated with each other, but my impression is that Linn's direction is quite different from ours. They want to build the biggest hi-fi company in Europe, and you're not going to do that in the specialist market. It's not going to happen. We're interested in the specialist market, in doing things as well as they possible can

² JV and I have opposing views regarding the importance of soundstaging, imaging, and three-dimensionality.
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**KK:** *Now that you are no longer tied to Linn loudspeakers, your future involves Naim speakers. The SBL has already been launched and will be familiar to readers, but you showed the long-rumored Naim electrostatic to trade visitors at the 1987 Heathrow Penta Show in England.*

**JV:** I should say first of all that it’s not a full-range electrostatic; it’s a hybrid. The tweeter is a ribbon unit, and the reason for that is that in order to get really good dispersion characteristics, and phase characteristics to match the character of the other two parts of the system, one needs to have a very small radiating area. An electrostatic element which does that is very, very difficult to drive. Although we’ve made units like that, in the end we reckoned that it was really safer to have a ribbon because it was a lot easier to drive. We don’t cross over to the ribbon until about 6kHz, so power handling isn’t a problem. Then there are the areas of electrostatics which people complain about. One, of course, is dispersion at high frequencies; the ribbon was the answer to that. The other thing is level; none of them go loud enough. In order to get level, you need to allow the diaphragms to move far enough. This is basically a question of having the plates far enough apart and getting them sensitive enough so you can get that level out of the speakers without having too big an amplifier. If you’re going to have a big plate with big distances it’s not going to be very much of a capacitance so you have to have pretty high bias. You have to insulate the things in novel ways without losing the efficiency, so that they don’t arc under those conditions. You have to get the coating on the Mylar to stay there and not migrate all over the place, you have to be able to get exactly the right impedance of coating to suit what you’re trying to do.

The next thing is the ability to move, which is how you get the bottom end. On the prototypes in the factory, you can play 20Hz at around 96dB sinewave, and you hear pretty much nothing. You feel it and you feel considerable pressure on your ears. They do go very, very low indeed.

**KK:** *Doesn’t this require massive bass drivers?*

**JV:** No, they are about two foot by one foot, have large excursion, and pretty good sensitivity. The other thing which is different from other electrostats is that the bass units are actually loaded. The speaker is about ten inches deep, and it has a series of tubes behind the bass panels which load the things and stop the excursion at resonance from going too far. It controls the whole thing, and you get the maximum levels instead of having them canceling.

With Naim 110 amplifiers, peak level at the moment is around 117dB—not at 20Hz, I hasten to add, but over most of the usable band. Sensitivity is about 88dB for 1W, or 2.8 volts, and the impedance is not unreasonable at all. It’s about four or five ohms, and it drops a little bit here and there.

**KK:** *As these are “dipole hybrids,” are they as critical of placement as we expect of conventional electrostats?*

**JV:** You have to have them away from the wall, but since we’ve only got a couple of pairs, we haven’t had the opportunity to go around in all the different rooms to see what happens. They don’t seem to be particularly critical. They just need to have air behind them. In one of our listening rooms, which is very, very small, it was quite surprising how nicely they worked.

At the moment, we haven’t got the passive crossover, so they’re tri-amped using the Naim external crossover. But there will be two versions, and you can order it either way. Inside
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the bias box which lives inside the speaker, there's space to put an internal passive crossover so you can use it either way. An economy-minded consumer could start out with one small Naim amp and later change over from passive to active crossovers. People who are not into enormous levels will be pleasantly surprised.

KK: That sounds like a reaction to the early Quad. Are you still inspired by that design?
JV: I think so. I certainly still have a pair and I think that there are at least another two or three pairs among the people at Naim in the UK. Every so often I bring my pair up and stick them into our big demonstration room and we have a listen to remind ourselves of how good these things actually were. Whatever it is—27 years ago or something. It was a super piece of design. One of the big differences between, say, Quad and ourselves is that Quad set out to make a speaker with all the advantages of electrostatics at a price which people could afford. We've not set out to do that, or in anyway clash with what they've done. We've aimed to make it as good as it can possibly be and to hell with the price. Whatever it costs, it costs. I can't give any idea as to how much it's going to be, but it will be a high-end item.

I look at the sorts of components that we're involved in. The plates, for example—two feet by one foot by one inch—have to be flat to better than 0.7 of a millimeter in that two feet because you want to keep the capacitance of all the units very, very close. That has involved our talking to experts at British Aerospace as to how to get materials, which they've suggested, and it's led us to particular alloys which have to be processed in a special way, with an awful lot of holes in them; when it's been drilled or punched, the whole plate has to have every single sharp edge removed. Precise radiiuses on every single hole, inside and outside, otherwise you get all sorts of problems. The insulation then has to be put on. We've got to build clean-air rooms, two of them, one with one sort of chemicals and another without the chemicals because most of the chemicals actually eat bits and pieces until they've dried. The whole thing is an incredible ballgame.

One of the chemicals we asked for, the company said, "Sure we can supply you, but it only comes in 25 kilogram packs. Is that okay for you? Is that enough?" So we said that would be enough. Guy Lamotte, who is the designer of the speaker, came back and said, "Let's put in a regular order. For 10cc a year." Because that's about all we'll need of that particular chemical. In fact, 25 kilograms will keep us going until the end of the century.

KK: Did you consider using the technique employed by Martin-Logan of curving the diaphragm for better dispersion?
JV: No. The dispersion has to do with the actual radiating areas, and how you cross over between one panel and the next, as much as it has to do with shape. The shapes are arranged in such a way that the sound is absolutely seamless, and you can wander around the room anywhere and the orchestra just sits there in the middle; you can move around the instrument. It's quite uncanny.

KK: How did you manage to find a ribbon with the same phase characteristics as an electrostatic?
JV: Aah, we didn't. We've actually taken other people's bits of ribbons and mounted them in a completely different way and given them a completely different type of phase-correcting throat or loading.

KK: As far as interfacing with a variety of amplifiers, we know that Quad's ESL-63, early on, had a problem with amplifiers without protection. When the speaker shut down—
JV: —it shorted the power amp. While that's probably okay, it actually did it for an awfully long time, like 200 milliseconds. Now that is
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a long time in the life of a transistor. It's not so bad because it wouldn't normally occur with modest-sized amplifiers under anything other than fault conditions, so that was probably OK. But the early ones were actually sensitive to arcs outside the speaker, and used to shut things down and could damage things quite badly. They fixed that; it's no longer a problem.

If you drove the original Quads too hard, you'd make a hole in the diaphragm and that would be that. The later Quads have very sophisticated protection systems which not only cut the low-frequency energy fed into the speaker at high levels—as you get louder, you actually get less at the bottom end—but it also shuts down when it senses an ionization inside the speaker. Ours has no protection at all. If you overdrive it, the diaphragm will stick itself to one of the plates, discharge, take a few moments before it charges up, then come back again— with no harm at all.

**KK:** What's the audible effect?

**JV:** It splats, and then silence. I don't know about damage to other people's amplifiers, but it doesn't damage Naim amps. So far as we know, Naim amplifiers didn't suffer from Quad shutdowns either, though I actually thought that it might occur.

Naim amplifiers are protected. First of all, there's the fuse; if any total disaster happens, the fuse will blow. The next thing is the thermal sensor in all the amps except the Nait. If the case exceeds 70°C, it cuts the mains, the whole thing turns off, and you have to wait for it to cool down. Also, the amplifiers have built-in power limitation. They constantly measure the current through the output devices, the voltage across the output devices, and integrate that with respect to time; it's a true power limitation. The 135 also has a fan to help dissipate the heat. The 250 amplifier has four regulated power supplies, each of which will feed something like 16 or 17 amps continuously at ±40 volts, and give you a peak of around 30 amps for up to 10 microseconds. This would indicate a fault condition because the amplifier's rise time is less than 10 microseconds. Then the power supply will shut down, both sides exactly symmetrically, and it will take a minute or two for the amps to reset. You just turn the mains off.

That was the problem that Quads would cause when they shorted the amplifier out. Quad fixed the problem quite early on with an alternative earthing arrangement. Once that was fixed, there was no further problem.

**KK:** By the way, what are you calling the electrostatic?

**JV:** The FLI— Flat Loudspeaker 1.

**KK:** As far back as three years ago, you were talking about producing a Naim cassette deck. Has the possible demise of analog cassette due to DAT killed your plans?

**JV:** Not yet. The biggest difficulty has been to get Papst to make the transport we want. They've finally done it; it works really nicely, and it's beautifully made; very consistent. Unfortunately, they've been rather slow about it; samples due in January 1986 didn't arrive until September. There have been delays all along the way, so that hasn't enabled us to put it on the market before now. In fact, we would have if they'd actually produced the transport on time. The Papst transports are industrial ones, for hotel systems and that sort of thing, designed for unbreakability, to run for a year without hassle, 24 hours a day. The one we have is a dual-capstan design not used by any hi-fi company at the present time.

Our commercial problem is that we are likely to sell only 500 very expensive cassette recorders unless we can break into the professional market, and Papst insists that we buy 500 of these transports for roughly £100,000. If DAT is better than the best analog cassette, then I'd have to say we'd end up with having three or four of these Naim analog cassette decks kept in the factory—or in my home—to be used for dubbing master tapes from friendly musicians. That sort of thing may arise.

The indications I have about DAT so far are that, while it may be better than CD in my terms, it doesn't compare with the very best analog.

But beyond cassette or DAT, there are so many other things which are dead certain to occur. There's the smaller dynamic speaker, the NAC52 preamplifier—a new high-end six-input preamp with user-configurable inputs—and a stereo television tuner. We've also got a small FM tuner coming, to match the Nait. This is nearly together, and the cassette deck is virtually finished.

**KK:** Would you consider making a DAT machine?

**JV:** Oh, if somebody would play with us with the transports. But we're not going to get into making helical-scan-type transports.
Professional Audio Consultants Inc.

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Stereophile, March 1988
Right now I feel like Lewis Carroll’s Alice. My office Wonderland is a scene of utter devastation, the scene of a full-scale riot. The rioters were drawn entirely from the ranks of my own family, all under the age of seven, who learned the art of social intercourse and the value of calm and decorum from a TV program called *Masters of the Universe*.

One of my children has brought in a whole raft of emergency rations from the kitchen a few yards away ("in case I get hungry"), spreading rice-cake crumbs and water with gleeful abandon, and another is commanding a (noisy) computerized helicopter gunship. One recalcitrant, about two years old if I remember right, has just switched the bloody thing off midstream for the fifth time today, to howls of protest from the older ones, after pretending to derive considerable pleasure from watching the action on screen. Devastation, utter devastation.

God knows how I have managed to keep sane as the pressures grew during the recent school holidays, and I have no idea how I managed any organized work at all. My bank manager insisted, though, and somehow I managed to batch-test 30 turntables and arms for a large scheduled test project, my first.

I even managed to cobbler together a quite respectable little lab for FFT and other measurements. Great stuff, but in the end some of the simpler measurements—for example, of turntable wow using a test record and a wow & flutter meter—often ended up giving us much useful information as the most sophisticated structural analysis that I was equipped to perform.

A particular problem arose with a number of turntables, but turned out to be especially prevalent among the ranks of the expensive ones. A classic example arose with the Scottish-made Source, a rare and costly beast which I was able to test with the Odyssey tonearm (formerly independent, the two brands are now built by the same umbrella organization, Source/Odyssey Ltd.). The Source is a magnificent creation with a superb phosphor-bronze felt-topped platter weighing 16.5 lbs., and a wonderfully crafted chassis. However, the deck was clearly incapable of keeping a steady speed. Piano notes would waver as they sometimes do when you record music with an ordinary (linear) video recorder, and listening was therefore an edge-of-the-seat thing, for all the wrong reasons.

This kind of problem, inexcusable on a turntable this expensive (the best part of £2000 with arm), arises for easily understandable reasons. The platter has an enormous moment of inertia, largely (one supposes) to iron out motor cogging effects. On lower-inertia players, a bit of what otherwise might seem excessive belt compliance may be used to improve motor filtering. On a deck with as much rotating hardware as the Source, you’d think it might be feasible to go for a slightly stiffer belt than usual. Not a bit of it. The result is all too predictable—the platter acts as though it was a weight on a spring (which in a sense it is, only we’re talking about rotating masses rather than weights suspended in a gravitational field), and the running speed is intrinsically unstable.

The long and the short of it is that, subsequent to the review being put to bed, the PR company came back to say that they concurred that wow was audibly present, and that they had effected a cure by running their deck with two belts.1 Could this start a trend? I think we should be told...

The Source was not the only turntable to behave like this, merely the most expensive. Another example arose with a turntable called the Omega Point, successor to the Image/Dais, a consciously minimalist player with an O-ring damped platter and no suspension in the usual sense. These turntables and others like them stand at the end of an evolutionary process that has seen the hardware becoming ever heavier and more outrageously engineered, to the point where I am suspicious about the long-term abilities of items like main bearings to cope (this general observation is not aimed

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1 The early (1982) version of the Michell Gyrodek also suffered from this problem. The belt compliance was too high, resulting in a belt-compliance/rotating-mass resonance with too high a Q, speed instability and dynamic wow being the result. This, too, was resolved by the use of two belts in parallel.

—JA
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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).

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Stereophile, March 1988
at any one deck). The loadings in some cases must be enormous, and if simple things like getting the platter inertia/belt compliance compromise right apparently lie beyond manufacturers' capabilities, what confidence should the fee-paying public have that the more complicated problem areas—of which main-bearing design is just one example—are being done right?

Based on what I heard, I'm far from sure that most manufacturers are even asking the right questions. The most convincing evidence for this is the simple observation that almost none of these glamorous heavyweights can convincingly outperform established models like the Linn LP12, to pick an example that is not my personal favorite. More generally, it seems extraordinary that in Year Five (is it that already?) of compact disc, turntable designers have been busily turning their backs on perhaps the one indisputable superiority of CD—its ability to (sonically) turn on a dime.

I don't wish to sound like a gramophone record, but it bears repeating that easily the most exciting development over the last years has been the emergence of the Roksan Xerxes turntable, not simply because it is demonstrably good to listen to, but also because it is the outcome of fresh thinking and incorporates novel solutions—even though I don't claim to understand them all, and despite a certain amount of BS in their propaganda (mostly in the early days). It works, so it's safe to assume there's something in it.

In the case of the Linn Sondek LP12, fitted with Ittok and Troika, I was particularly struck by the way it confided to sound even fresher and more vital than it has in the past, which is a tribute to the continuous and well-informed development program that backs this product. By the way, rumors of a new Linn, or a two-speed variant of the present LP12, have been gathering strength over the last few months. Maybe something will have happened before this reaches the newsstands. Perhaps a replacement is on the horizon for the Ittok arm as well. I feel that I can detect the weaknesses in the Ittok, which I suggest time hasn't treated quite as kindly as the turntable.

Of the other arms I reviewed, I was particularly underwhelmed by the Odyssey. A masterpiece in aluminum and gold plate, the arm is both rare and exceedingly beautiful. It is also exceedingly weird, having many odd protuberances and offsets, reminding me in many ways of the first Mission arm, the 774. But it doesn't appear to offer that underrated arm's structural integrity, despite much higher effective mass. Sonically it's smooth and inoffensive, but fails to cut to the quick. The cynical could point out that the seriousness and dedication of the design can be gleaned from the options list. Jewelled fingerlift indeed!

At the other end of the market, the Rega arms continue to build on their widening reputation as the outstanding budget designs. The lack of built-in height adjustment is no problem for British buyers, many of whom would rather trade adjustable VTA on the fly for the extra structural rigidity that ensues from eliminating height adjustment. The cheaper version of the RB300, the RB250, is widely sold as an OEM arm, particularly under the Moth brandname. (Moth Marketing, coincidentally, is Stereophile's UK distributor.)

I was impressed by one new up-market turntable, which was originally designed as an arm test bed. The Alphason Sonata, combined with their own much-improved HR-100S-MCS arm, seems to me a truly excellent design that ought to prove attractive to SOTA, Oracle, or other heavy-platter turntable fans. It is an incredibly heavy suspended-subchassis deck, with a synthetic platter/clamp arrangement and a drive system based on two synchronous motors. It has that heavy-deck sound—the strength at the bottom end, the solid architecture—but it also has the dynamics, the balls, and it doesn't suffer unduly from the soft, inarticulate quality that seems to be a natural part of modern up-market turntables, especially the heavyweights. It has noise and speed. Put all these things in the melting pot and you have an exceedingly powerful sound, a B-52 with some of the agility of a Porsche 911.

Looking through the list, there's no shortage of diversity. At the bottom of the market, there was a replacement for one of the best-known and best-selling turntables of all—the Dual CS505. The 505 is a semi-automatic belt-drive player equipped with a rudimentary suspension, and which sold with a simple (Ortofon) cartridge for about £120. The replacement is called the 503-1, and it has been simplified and

2 The Odyssey is without a doubt the arm Gaudi would have designed if he hadn't been already committed to making Barcelona one of the more "interesting" European cities architecturally.  —JA
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rationalized for more economical mass production, one of the casualties being that suspension. Unaccountably, Dual has also elected to place the motor on the arm side of the main bearing. Hum is rarely directly audible, but is a probable, almost subliminal influence on the way it performs.

Had the new deck conspired to offer greater structural integrity than its predecessor, all might have been well. Sadly, the accountants have won. I’ve no idea how important the 505’s isolation system was in decoupling the deck from its environment, but I’m not at all sure it even matters. I strongly suspect, though, that the 503’s solid construction means that any resonant properties in the chassis imprint themselves where they’re wanted least: on the cartridge output. The chassis itself is made of a clever expanded polystyrene material said to have the sonic signature of chipboard. And I thought chipboard was only used because it is cheap...

The new turntable sells at not much more than the price of the old, and in the absence of the 505 (the de luxe version is still on sale, but its days must be numbered), or much else in the way of direct competition, it still represents excellent value for money. Indeed, most of the early reviews have been highly favorable, so clearly there’s some spread of opinion here. But there is one competitor on the horizon, from a manufacturer whose products are relatively widely available in North America—Ariston Acoustics.

Ariston’s contribution to the budget turntable market is designed to sell at much the same price, and comes bundled with a cartridge, the very same cartridge used in the older Dual turntable, which is certainly no worse than the one in the new turntable. Called the Q-Deck, this too is a solid (unsprung) semi-automatic deck, but the chassis here is a thick sheet of Q-board, an Ariston proprietary chip/rubber composite which is structurally very well damped.

With a quite heavy platter and standard Japanese OEM arm, it knocks spots off the Dual. The only problem is that Ariston doesn’t have Dual’s superb marketing to back them up. With a bit of Dual-style Teutonic promotion instead of their rather lazy Scottish equivalent, which tends to pace itself in periods defined by the maturation of a good malt, the Q-Deck could really go places.

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Turntables and tonearms have been with us for decades in numerous reiterations, and it would seem that in light of the unmistakably positive direction that CD developments have taken, progress in turntable design would have come to a screeching halt. Yet the reverse is true—just when you thought that it was safe to select your “final” turntable, you find yourself right in the midst of an unprecedented turntable renaissance.

Not that the turntable per se is regaining its popularity with the masses. Far from it. The current upbeat events surrounding turntables are encouraging only at the audiophile level. It’s here that all the exciting developments are taking place, and at a very spirited rate, as brand-new entrants keenly vie for shelf space in high-end salons. These venturesome efforts have resulted in newly designed wares, not mere spin-offs from existing product lines. Lurne, Basis, Meitner, Versa Dynamics, FR, Alphason, and, of course, Well-Tempered Lab are all making their debuts with turntable products.

The veterans, for their part, have also not been idle. For example, VPI displayed their new all-out effort at the Stereophile show in NY last October, SOTA showed their Cosmos
in Las Vegas in January, and Oracle was touting a Mk.III version for their Delphi, Alexandria, and Premiere models.

Of course, all this is well and good. Competition is still the best impetus for propelling creative powers into high gear, and the results of these enterprise efforts have indeed been exceptional.

To be fair, we have hard and fast evidence that an expensive turntable can justify its lofty price tag. Right here at Stereophile, JGH embraced the performance of the $8000+ "record player" from Versa Dynamics with open arms. Not so close to home, at The Absolute Sound, the Goldmund Reference has been worthy of similar terms of endearment, and you could buy two Versa Dynamics 2.0 players for what the Goldmund will set you back.

These high-priced goods appear to have going for them the one thing expected: exceptional performance. But I maintain that expensive products are easy to make—just pour enough money into a design, and the end results are bound to be outstanding. It is easier to come up with an expensive good turntable than it is to create an inexpensive performer.

Fortunately there are designers around who do not march to the beat of an expensive drum. They believe that products should put necessities before niceties, and operate in an atmosphere where concepts such as novel, clever, practical, and cost-effective are the norm. One such man is Bill Firebaugh.

With his innovative tonearm he demonstrated that original thinking has a place in audio, and he has attempted to extend this freshness to turntable design as well.

We know a lot about the Well-Tempered Arm. It has been appearing in Stereophile's "Recommended Components" list consistently, and can even be found in JGH's reference system. Visually, the arm is likely to draw attention to itself, managing over the years to raise more than a few eyebrows. But Bill's bottom line is performance. While some might find it lacking in aesthetics, the fact remains that, engineering-wise, it is unique. The Patent Office thought so too, and has granted Bill Firebaugh a patent for his design.

Fortunately, Bill did not rest on his laurels. He easily could have—the arm has received worldwide recognition and has elicited numerous accolades. Instead, he went to work and designed a companion turntable.

Description

By his own admission, Bill approached the design of his turntable with grave naiveté. I'm sure he is not the first to underestimate the stringent requirements of a turntable, since at first glance it seems so easy—all it has to do is spin the record. Far from obvious is the fact that the turntable is an integral part of the minuscule world reigned by the cartridge. Here, the microscopic activities of the stylus can take place properly only if the stage has been set by this macro component. The cartridge's output will be generated in response to any motion of the cantilever; it cannot distinguish between a tiny wobble of the platter or the undulation of the speed groove of vinyl. If the cartridge can sit absolutely still, the stylus will encounter nothing but the information imbedded in the groove, and the cartridge's output will indeed be an exact electrical analog of the recording.

Easier said than done. In the real world, the tonearm is bound to shake, the platter holding the record will wobble a bit, and the cartridge output will be tainted accordingly. How each tonearm/turntable pairing comes to terms with these disturbances depends on the competence of each individual designer. For Bill Firebaugh, the name of the game is damping.

As was the case with his tonearm, BF took the path of most persistence to arrive at his turntable configuration, and what resulted is not exactly a run-of-the-mill product. You might want to read JGH's interview with BF (Vol.10 No.6) to hear his side of the struggle and get more of a feel for how the design evolved. Best of all, you are sure to become better acquainted with this enigmatic newcomer to the high end.

By designing the arm first, BF saved himself lots of grief. The intended strengths of the arm are stability and neutrality, in that order. Since most tonearm/cartridge combinations do not enjoy the WTA's inherent immunity from outside disturbances, the matching TT design could deviate from prevailing norms. In one significant respect, noticeable immediately, the WTTT is unusual (for a high-end turntable)—there is no suspended subchassis. This frees the design from complex and costly suspension-system components. The approach, instead, was to make the base very massive, and let that be the necessary stable platform for the platter and the tonearm.
The result is a significantly simplified final configuration where every component part is clearly visible and easily accessible. The platter and the tonearm appear on top of the base, and the drive pulley is right next to the platter, atop the motor assembly. Only the bearing is hidden from view, but can be found under the platter, of course. The bearing assembly is held firmly in place along most of its length in a 1.5" diameter opening, and sits flush more or less in the center of the base. The tonearm post is bolted to the base and protrudes from another, smaller hole located in the right rear corner, at a distance prescribed by the tonearm geometry. The WT turntable is really a two-piece affair: the motor is completely separated from the base and sits by itself on three small rubber cushions.

The base is 19" wide, 15¾" deep, and 3¾" thick, with a 5¾" square cutout at the left end to provide space for the motor assembly. The layered assembly comprises three 1"-thick pieces of Medite sandwiched together by an adhesive from 3M. In addition to its bonding qualities, this versatile mucilage also exhibits significant proficiency at absorbing sound waves, thus helping to cut back immensely on the unwanted standing-wave reverberations in the base. Medite, an upper-crust version of chipboard, is a resin-based fibrous material featuring the much higher density necessary for this application.

All turntables require isolation from the rigors of the very low-frequency pandemonium readily encountered in everyday life. Four ¾"-high rubber feet take care of this by providing the needed compliance to decouple all frequencies above 15Hz.

As Bill tells it, the bearing was the most difficult task of the design, even though the finished assembly is surprisingly simple in its execution. After many attempts, Bill ended up with a variation of the "round peg in a square hole" approach. The peg, of course, is the spindle, and the square hole the bearing. In this situation, if the top of the spindle is pulled into one corner of this bearing, the pull will be resisted by the two walls forming the corner. But since the spindle is round it will contact the walls at only two points, 90° apart, at the top of the square hole. Two other points, likewise 90° apart, but at the bottom of the hole, will act to hold the spindle erect. Obviously, the finite depth of the bearing hole provides vertical support. After considerable simplification and the addition of practical touches, here's what Bill uses for a bearing:

Everything is contained in a cylindrical plastic housing 3" long and 1.5" in diameter. It's an upside-down top-hat-like affair, with a ¼" outside lip at the top (re, the open end) to support it when lightly press-fitted into the base. The housing holds in place all the components for the bearing, and acts as the reservoir for the silicone lubricant as well.

The bearing makes contact with the spindle at five points, where each contact is a Teflon-tipped ¼ -20 screw. One of these screws points up, and is the thrust bearing to support the spindle vertically, while the other four, arranged around the periphery at 90° intervals, hold the spindle upright. These four points are not in the same horizontal plane. To perform properly they must appear in two levels, with one pair near the top and an opposing set at the bottom.

Each tier has two points to align the spindle vertically, and any tendencies for the platter to list are checked by the drive belt, which pulls the platter in place horizontally against the two upper bearing points. Consequently, the bearing has to be aligned to oppose the pull of the belt. A mark on the lip of the housing should always point toward the motor pulley. This is a "set it and forget it" adjustment.

Bill has an affinity for silicone. The tonearm uses it in the damping cup to stabilize the cartridge, and now the bearing well is filled with it too. While some damping of the bearing is desirable, lubrication is the primary function for the silicone here. The spindle's complete immersion in this viscous material ensures that its every rotation slides fresh lubricant into each of the five bearing interfaces. The support at the bottom, however, took a little more work than the rest. Initially, the problem was the weight of the platter pressing on this bearing point and squeezing the interface dry of lubricant. Soon it was realized that only a centered support had this dilemma, and the bottom bearing was moved off-center. Now, as long as the axis of the spindle misses the support, it will be freshly lubricated whenever the bottom of the spindle is in motion.

Since the bearing housing is open at the top, the turntable should not be canted severely during handling. The viscosity of the silicone in the bearing is lower than that of the fluid
used to damp the arm, and spillage is much more likely to occur. Of course, during shipping the silicone reservoirs in bearing and arm must be emptied.

For the platter, Bill uses an acrylic disc 11½" in diameter and 7/8" thick (acrylic is a Plexiglass derivative with good internal-damping properties). A ¾" hole in the center fits the platter on top of the spindle, where a flange supports it at the proper level. The 3-lb. platter is somewhat light in comparison with competing products.

A threaded hole is provided at the top of the spindle to accept a screw-down record clamp. The top surface of the platter is dished mildly to maximize the effectiveness of the clamping arrangement. In addition to pressing the record against the platter, the clamp also locks the platter to the spindle. Now, when the record is played back, everything is coupled tightly together.

The motor assembly is completely separated from the base. Here Bill had to resort to a heavy-handed technique to extract the necessary drive fidelity from the motor. While long-term rotational stability was not a problem for the synchronous motor used here, instantaneous deviations were wild and erratic. Some modifications to the motor bearing helped immensely, but not completely, since motor vibrations were still interfering. Now brute force was used—the motor was bolted to a massive chunk of lead, which acts as a ballast and stabilizes the motor. In the finished assembly, which weighs in at a whopping 13 lbs., the motor is clamped firmly between a ¾" steel plate on top and the lead ballast piece at the bottom.

Not counting the mounting-surface path, the only connection between motor and platter is via the polyurethane belt. It is 0.01" thick and ¾" wide, and drives the platter from its circumference. Considerable effort went into the design of the belt itself, since previous off-the-shelf samples were totally inadequate. Working closely with the supplier, the ingredients were reformulated to produce the desired physical parameters. Only then could the belt be produced with the desired consistency and be counted on to perform properly.

And, yes, it does have that famous half-turn twist that a number of other manufacturers are also now using. As Bill tells it, he accidentally discovered that a half-twist in the belt produced lower flutter readings and these, in turn, contributed to better sound. He speculates that this twist cuts down the resonant modes of the pulling belt, thus keeping the rotations more constant.

Sonic Conclusions

Obviously the WTTT is a meticulously crafted product whose every component has been fine-tuned to extract maximum performance. And, I'm happy to report, all these efforts have not been in vain—the WTTT is one marvelous performer.

One way to judge a component is by the company it keeps. I discovered that the WTTT can hold its own very comfortably even when playing host to some rather esteemed high-end celebrities. The turntable and arm reviewed here are owned by me, and have been in use for well over a year. During that time my reference system has benefited from some upgrades which fortunately worked to better its performance. The remarkable thing about the WTTT is that it stayed right in step with these upgrades without missing a beat. The present configuration, as used for this test, consists of an Ortofon MC-3000 cartridge, the ARC SP11 Mk.II preamp, Krell KMA-100 Mk.II power amps, Apogee Duetta Mk.II speakers (bi-wired), Krell "The Path" speaker wires, and interconnects from Audio Research. To my mind, the most dramatic event during the evaluation of the WTTT occurred when the new Mk.II version of the SP11 arrived. (I'm pleased to report that ARC has done their homework once again, improving their already remarkable preamp to yet another level of excellence.) As far as the WTTT was concerned, it passed this test superbly, handling the upgrade with dignity. The turntable's good qualities were now even more obvious; I single out the ARC preamp in particular as a major factor in being able to hear the WTTT to a more complete degree.

The point is, here we have a turntable/arm combination listing at $1495 which can quite handily withstand the scrutiny of some very prestigious performers and still come through with flying colors. So don't be put off by its modest demeanor—sonically, there is significantly more to behold here than meets the eye.

I think today's outstanding products cannot be singled out by what they do well in only one or two categories, but should be judged
by how they perform across the board. The
days of getting by on partially fulfilled re-
quirements, {i.e.}, only great midrange but poor
bass, etc., are coming to an end. In that
respect, I'm happy to report that the WTTT
is certainly contemporary and displays a
sweeping combination of desirable attributes,
a combination that, I might add, appears to
have been optimally honed.

It's with great difficulty that I point to any
of these characteristics individually, as they
overlap and operate in a very cooperative
fashion. I'll start with clarity, dynamics, and
staging, since these are the three most cap-
tivating areas of excellence that come to mind.

The WTTT seems to clean up the musical
event and render it more prominent. It's as if
the music took a step forward and separated
itself from the prevailing background grit and
grunge. The quiet between the notes is sud-
ddenly more silent, and the music is allowed to
appear with greater significance. Consequently,
most sounds can be perceived with a sense of
individuality and purity.

But purity is not a self-sufficient situation—
dynamics also contribute. As a matter of fact,
this area may well be the forte of the WTTT.
Impacts seem to pack more wallop every-
where, strings snap with more vigor, and the
brass sections push more air around. Rim
shots, bass drums, voices, all are treated with
a minimum of restraint, peaking more sudden-
ly and sounding louder. What is fascinating
here is not the preeminent performance of the
loud, blasting passages, since they get taken
for granted soon enough, but how important
it is for mild intonations to have speed. For ex-
ample, brush hits on cymbals do not have to
be forceful; mild impacts played back
dynamically intact have an extra degree of
credibility.

But a great deal of the sense of the real
comes from the way transients are handled.
The transient integrity is certainly remarkable,
since the WTTT does not curtail the attack
speed of transient impacts, and allows decays
to die away at a rate much more extended than
experienced before. Here, very fine inner
detailing is of great help. It appears that the car-
tridge is allowed to really delve into the groove
and reveal previously unheard information. It's
amazing how a number of seemingly small
details add up to communicate a convincing
performance.

Next, and certainly not last, is staging. Re-
cordings known for their lively environments
suddenly spring to life with a kind of sonic ef-
fervescence, proceeding to recreate a sound-
stage seemingly bubbling over with a myriad
of details. This full-blown bloom is very vivid,
and adds a significant vitality to the sonic
panorama. What results is a soundstage that
starts out very wide at the front and continues,
without shrinking, very much to the rear. This
last is particularly rewarding, and is not very
often achieved with other components.

At all times a sense of stability is pervasive.
Notes do not waver, nor do they hesitate.
Over-tone structures coexist with the air surround-
ing the instruments, creating a comfortable
acoustical setting. Images are very steady, and
instruments seem locked in their positions.
The sound is crisp and detailed, lending great
credence to the validity of the playback process.

No doubt about it, I like this product. The
WTTT has impressed me very favorably in-
deed, and the time has come to assess its per-
formance relative to some familiar product
with an established, and hopefully, familiar
track record. What comes to mind immediate-
lly is the VPI HW-19 II. Here's a turntable
that can be found in Class A of "Recommended
Components;" is affordable to boot, and en-
j oys bona fide popularity with the high-end
crowd.

Technically these two products are cast from
much the same mold. Both are belt-driven and
use synchronous motors to power their pla-
ters. Speed changes are taken care of by the
user, who simply positions the drive belt on
the proper level on the two-step pulley on the
motor shaft. And both products use mechan-
cal clamps to hold records to the platters. The
VPI is a self-contained unit where the motor
is an integral part of the base, and even size-
wise, both end up being about the same.

It's here that all similarities end. The VPI is
designed to be a universal product and can, as
far as I know, accommodate any tonearm in
the world; obviously, a distinct advantage. The
WTTT, on the other hand, is a specialized
component dedicated to exclusively accom-
pany the WTA.

This is a very important consideration and
cannot be overlooked by those who have flex-
ibility in mind and already own, or may be
considering, other tonearm designs. The VPI
has one of the most convenient armboards go-
ing, and the process of changing an arm is reduced to a simple but accurate procedure. It is this flexibility that made the VPI such a desirable and, as it turned out, convenient baseline component for this exercise.

From the outset everything appeared very straightforward. It looked promising that, for once, two components could be compared on a one-to-one basis without undue outside influences. The basic idea here was very simple—let’s see how the WTTT fares when compared with an established product like the HW-19 II. (As configured here, the VPI enjoyed the added benefits of the external Power Line Conditioner.)

If you really think it through, side-by-side turntable evaluation is downright tedious. To do it right, you need a system in which everything stays constant, the only change allowed being the substitution of the turntable under test. “Everything” means just that, and includes the arm and cartridge.

The WTA tonearm was used by default; the WTTT accommodates no other design. The WTA itself is a universal design and can be fitted to the VPI without any problems.

And here I have a problem! This is basically an evaluation of the Well-Tempered Turntable and my concern is the Well-Tempered Arm. Since the WTTT was designed to mate exclusively with the WTA, no other arm can be considered here. Now, when we take into account Bill Firebaugh’s engineering acumen, the probability of synergy is acute. Of course, this is just dandy for the product under test, but, scientifically speaking, a more “neutral” tonearm would have been more desirable. By the way, in order to even out any interaction that might slant the evaluation, two cartridges were used. These were the Ortofon MC-3000 and the Monster Cable Alpha Genesis 1000, both moving-coils.

Fortunately, the WTA is a delightful device for this purpose and can be moved with the greatest of ease from one turntable to the other. It helps to have an extra mounting post around so each turntable can have its own pillar for the WTA, and the transfer is reduced to a simple case of sliding the arm assembly onto the post of the active turntable. To streamline the interchange even more, I modified the cable termination box for the WTA so it could be snapped in place at the rear of each turntable base.

The process of swapping the turntables became the most demanding physical task, as each turntable had to be lifted and positioned time after time on the Arcici “Lead Balloon” turntable stand. Switching the arm between turntables was a snap, however, usually taking all of 30 seconds. Setting up the arm was another story.

The arm plays a crucial role here. By acting as our test probe, it provides the only link to the inner sanctum of the table’s works. A miss here can invalidate the whole evaluation. Setup-wise, there are five important arm parameters: tracking force, geometry, anti-skating, VTA, and azimuth. Of these, only the last two were fussied over. Fortunately, the first three settings could be adjusted in the beginning, very carefully of course, to be identical for both turntables; they were then not touched for the duration of the testing.

Not so for VTA and azimuth. To simplify VTA indexing, the platter height above the base was adjusted to be the same for both turntables. Now corresponding markings on each arm shaft denoted identical vertical distances, allowing direct transfer of VTA settings between turntables. Azimuth required similar attention. It turned out that the “dishing” angle for each platter was different, mandating that the azimuth settings be retrimmed every time the tonearm changed turntables. I can’t resist, and simply must praise the design of the WTA. Its user-friendly features turned this evaluation from tedium to pleasure. The azimuth adjustment is special enough to deserve a medal—it must be, by far, the most convenient in the industry. Even while a record is playing, fine-tuning a setting is ever so convenient.

After both turntables were finally shut down, and the WTA had sampled its fair share of vinyl from each platter, the WTTT still dealt aply with the earlier outlined musical aspects of reproduced sound. To me, the WTTT is the more satisfying product.

That is not to say that I would initiate impeachment proceedings to vote the VPI HW-19 II out of Class A. I can well hear why it is there, and I’m not about to challenge its status.

Undeniably, the VPI’s bass performance is remarkable; I would rate it as one of its strengths. The bass is tight, reaches down low, and conveys a sense of power. The music is supported very convincingly by this firm foundation which, though most apparent in
the lower registers, filters up into the lower midrange. Here the sound benefits from a richness that imparts a sense of authority to male voice and cellos, for example. That's not to say that the WTTT is deficient in any significant way. The definition and speed are still there to a most satisfying degree (we'll come to dynamics in a moment). So, while not necessarily going down lower, the VPI's bass performance was more charged and more prominent than the WTTT's.

Dynamically, the VPI is remarkable enough in its own right, but the WTTT manages to rise to the occasion more dramatically, hitting home with a bit more authority. Generally things jumped more, the hits had more sock, and plucks were more potent. As mentioned earlier, even at reduced volume levels impacts exhibited a similar intensity of energy. The VPI did not have the same sense of thrust in these less vigorous outbursts.

The VPI's soundscape appeared very transparent and abundantly detailed. To me, the lateral expanse was just about as wide as the WTTT's, and while it reached back equally far, it concentrated on the action in the middle of the stage. Consequently, the sense of space appeared slightly reduced and was not nearly as convincing. The WTTT captured this aspect more effectively by maintaining a wide spread well into the whole stage, which materialized in a more billowing soundspace.

The VPI was tinged with a prominence in the treble which the WTTT lacked. On first listen the VPI appeared to be doing well with material, such as big-band music, that featured finely etched transients and very energetic high frequencies. With the WTTT in the system the presentation changed considerably. The highs took on a sweetness and became more delicate and airy.

Curiously enough, the VPI always managed to sound subjectively louder, as if the volume had been turned up by a notch.

On balance, I would characterize the VPI to be the more robust sounding. It starts out with the potent bass, goes up through the vivid midrange, and continues on out to the treble (which I found a touch brittle).

To be sure, the VPI held me spellbound on quite a few occasions, and I enjoyed the product immensely. But the tendency here was toward the sonic spectacular, as opposed to a musically involving experience.

That's where the WTTT and Arm come in. This combination manages to extract a more plausible and absorbing presentation that implies eloquence and possesses more musical presence and poise. It's a sweeter sound which, I'm sure, some might even find too laid-back. But when it comes to recreating soundspace and unabridged transient decays, along with the unbridled energy of dynamics, the WTTT is right there to lend you a helping hand.

Having said that, I must remind you that the WTTT is not a turntable for all tonearms. I would be very surprised to learn that Bill Firebaugh did not optimize the synergy between these two examples of his handiwork. At the same time, I can't help but notice how well the VPI presented itself while "contending" with a product designed by the competition.

The VPI can do one thing the WTTT can't—shed the WTA and enlist the services of the likes of the SME V, the ET II, and even the Air Tangent.

But now I'm doing what I objected to in the beginning: taking the easy way out by pouring on money.

I have already proven how I feel about this product—I own it. It has a lot going for it: The set-up is extremely easy—once you have it assembled, you're done. And remember, it has no floating subchassis to fiddle with. (If the WTTT had made its appearance when I owned my Linn, I would have bought it on the spot, just to get rid of all those endless adjustments.) It is extremely easy to use: clamp the record down, push the On button, position the cartridge over the record, and away you go. The absence of a cueing device should not intimidate—the viscous-damped arm cannot fall fast enough to do damage. Just be careful, when moving the turntable, to first remove the belt. The motor assembly is not attached to the base, and the belt could be stretched if left in place.

If you are concerned about acoustic feedback problems, don't be! Even though I normally use it on a "Lead Balloon," the WTTT has been in some real nasty combat zones, sonically speaking. It did not exhibit any jitters at all, even when bombarded by some high-caliber bass notes.

I do have to confess that, during the past year, I have subjected the WTTT to the whims of my sonic doldrums. Yes, I pushed it aside
now and again. But time after time I have come back to this remarkable combination from the Well-Tempered Lab, enjoying each time all the wonderful things it does to make the music more enjoyable. To me it's a significant sonic standout, and I recommend the Well-Tempered Arm and Turntable wholeheartedly.

MORDAUNT-SHORT SYSTEM 442 LOUDSPEAKER

Martin Colloms

Floor-standing, reflex-loaded, two-way loudspeaker with "floating" enclosure, "reaction-cancelling" second bass unit, integral stand, and POSITEC protection. Drive-units: titanium-dome tweeter, 6.7" (170mm) polymer-cone bass/mid unit, 6.7" (170mm) polymer-cone secondary woofer. Crossover frequency: 5kHz (6dB/octave acoustic low-pass, 12dB/octave high-pass), secondary woofer rolls off at 12dB/octave above 250Hz. Frequency response: 50Hz-20kHz (-3dB points). Anechoic low-frequency response: -3dB at 50Hz, -6dB at 38Hz. Distortion at 1m at 96dB sp: less than 2% 2nd harmonic, less than 1% 3rd harmonic, 100Hz-20kHz. Sensitivity: 87dB/W/m. Nominal impedance: 6 ohms. Amplifier compatibility: 40-300W. Dimensions: 37" (945mm) H x 10.25" (260mm) W by 14.75" (375mm) D. Weight: 55 lbs (25kg) each. Approximate number of dealers: 40. Price: $2500/pair. Manufacturer: Mordaunt-Short, Durford Mill, Petersfield, Hampshire GU31 5AZ, UK. Distributor: Teamco Inc., 1225 17th Street, Suite 1430, Denver, CO 80202. Tel: (303) 293-9737.

Mordaunt-Short's last big speaker, the Signifer, was introduced in 1979 and comprised a classic three-way design using a custom-built 6" wide-range mid-driver. It achieved some good reviews in its time, but in recent years the company has tended to concentrate more on their evolving budget range, which is dominated by such strong sellers as the MS25ti (strong in the UK, at least). However, their designer, Phil Ward, found the time to develop a new high-end model after the development of the 'ti series was completed. The result is the System 442, and Phil showed considerable courage in attempting a new technique of cabinet construction, aimed at reducing the contribution of the cabinet to overall coloration levels, as an integral part of its design.

Reducing coloration has been a major task affecting all loudspeaker designers, who remain acutely conscious of the need to control both resonance and vibration. Enclosure resonance can make or break a design, and even today the lion's share of the coloration in most box systems is due to the box and not to the drivers. (The Wilson WATT, reviewed last month, stands as eloquent proof of this fact.)

Traditional measures have included making the panels thicker, which is only partially successful and generally results in an increase in stored energy by lengthening the overall time...
signature, to the detriment of the transient response. The BBC method for resonance control is based on listening tests which employ critical sounds such as male speech and piano. These suggested that the ear was especially sensitive to midrange coloration and that most enclosures have panels which resonate well into the midrange. The preferred solution comprised the use of thinner panels with a combination of mass loading and damping, imparted by a thick bituminous felt layer. By this method, the more significant resonances were moved down the frequency range out of the critical region while the transient response was much improved by the high-energy dissipation rate of the damping layer. This technique remains a valuable one, especially where exceptionally low mid coloration is required, but it does involve a compromise. Thin-walled cabinets, however, damped or otherwise, are sufficiently flexible to have elastic properties at low frequencies in the pressure region below 100Hz. Consequently, bass power is lost while the low-frequency transient response is disjointed. Subjectively, the bass line is softened and weakened with the weight component seemingly out of step with the part responsible for "punch" or "slam."

Other ideas for enclosure design have led in the opposite direction, toward stiff, very light boxes whose high rigidity ensures a clean bass and whose low mass helps define a short energy storage, thereby offering low levels of coloration. The best known is the Celestion SL600, with its aircraft-grade aluminum honeycomb cabinet. Pursuing this idea of rigidity to the limit, B&W has also scored a notable success with their Matrix technique, the full Matrix enclosure containing a three-dimensional honeycomb which fits the whole interior of the cabinet. This multicell bracing results in a fabricated porous "solid" of exceptional rigidity. The superb low-frequency time signature is complemented by low coloration over the critical midrange, achieved by a high degree of damping imparted by the huge number of glue lines involved in the Matrix.

Since enclosure vibration and the resulting coloration can be such an important part of the final sound quality, there is a seemingly endless number of ideas associated with the subject. One concerns decoupling the low-frequency driver from the enclosure on a rubber mounting, which is intended to reduce coupled vibration from the driver frame at source. In most commercial realizations, the midrange improvement is audible and measurable, but some compromise in definition and low-frequency slam appears to result, perhaps the outcome of the residual fundamental resonance of the total driver mass and its compliant mounting.

Recently some interest has been shown in the idea of an enclosure designed in a more complex manner—integrated with a stand or supporting structure and perhaps with some means of isolating from one another sections reproducing different frequency ranges. The integral stand may play a key role in this separation. For example, the NAIM SBL is founded on a rigid stand on which the two main sections—bass/midrange and the treble—are separately mounted and partially decoupled. By this means the treble section is isolated from the bulk of the vibrations resulting from the remainder of the frequency range, which is said to significantly improve the clarity of the treble.

A further example is provided by the Roksan Darius loudspeaker, which, despite its controversial and idiosyncratic tonal balance, nonetheless demonstrates the virtues of an integrated stand enclosure as well as a fully decoupled tweeter mounting. The unusually shaped body is mounted within a full enclosing frame, which is coupled under controlled stress to specific points on the enclosure exterior, thereby clamping the main vibration maxima. The tweeter mounting is particularly interesting. Mounted on a small sub-baffle, it hangs on four long coil springs located at the diagonals and is freely suspended like a turntable chassis with a fundamental resonance around 2-3Hz. As a result it does not suffer any significant vibration from the main cabinet at frequencies greater than 10Hz. Rocking of the main enclosure is inhibited by the oversize base area of the exterior speaker frame spiked to the floor.

Unwanted excitation of the tweeter frame by vibration in the mid frequency range can give rise to a complex subtle frequency modulation of the high-frequency output, generating a kind of grain or blurring. Assuming the main consequence of vibration leakage to be frequency modulation due to the physical movement of the radiating source, stiff tweeter mountings will produce high resonance fre-
quencies with widely dispersed sidebands. Conversely, a low-frequency suspension results in sidebands so close to the fundamental frequency as to be indistinguishable from it. A 1kHz suspension for a 5kHz tweeter tone will give a low-level modulation nominally over 4-6kHz, while a 3Hz suspension results in a range of 4997Hz to 5003Hz, which seems virtually inconsequential. Certainly, decoupled tweeter systems appear to have a characteristic clarity differentiating them from other systems of similar build quality but lacking this particular feature.

Mordaunt-Short has addressed these questions in their System 442 with a super-rigid central driver chassis separated from the enclosure, which locates all three drive-units, allowing the enclosure proper to float, decoupled from vibration influences. In addition, the main drivers are mounted in physical opposition but in acoustic summation such that frame and magnet reaction vibrations are largely cancelled. The speaker system is also bass-reflex-loaded at low frequencies using a concealed port located on the underside, between the frame legs.

Two vertical steel beams—too short to be regarded as legs or even feet—project from the base of the speaker, and are welded directly onto the reinforced steel base plate, the latter forming the bottom deck of the integral stand (the external part of the chassis mentioned previously). This baseplate is threaded to take adjustable spiked feet to aid planting this heavy system firmly on the floor. This gives maximum control of rocking or vibration effects. Control of vibration is, in fact, the design hallmark of the 442; as the test results will show, it has been executed with a considerable degree of success.

The 442 also incorporates several other features which have been suggested in the past as worthwhile, including a narrow frontal aspect (considering the size of the speaker enclosure involved) intended to optimize stereo focus. Contradictory opinions have been voiced concerning the appearance of this floor-standing model. It does possess an unusual visual aspect due to its proportions. It appears rather top-heavy, with the considerable depth tapered over the lower half of the front section. The depth is, however, moderated by the division of the speaker into a rectangular and conventionally veneered shell for the rear section, while a dark fabric covers the front portion. All this seems to comprise the grill, but in fact this is not the case—the whole is solid apart from a small detachable grill panel located on the upper front section.

Appearances can be misleading, however. A visual estimate of this enclosure volume might arrive at a figure somewhere between 50 and 70 liters, but in fact the actual result is only 35, making this a moderate-size model in engineering terms. Given the complement of two 6½" (170mm) bass/midrange drivers per speaker system, bass reflex loading seems a wise choice to increase the power handling and output level as well as to achieve an effective tradeoff for sensitivity and bass extension.

With its integral stand, the 442 may be placed directly on the floor more or less straight out of the box, the only assembly steps concerning threading in the spiked feet for carpet or wood floors (blunt caps may be used where hardwood or stone floors are involved) and the loosening of a pair of socket-head bolts on the enclosure underside. This small step releases the floating enclosure suspension which is normally locked up during transit to avoid damage.

In the style of larger US systems, the 442 has made provision for bi- and tri-wiring, with three sets of combination binding posts with integral 4mm sockets. Metal straps provide the links for normal two-conductor connection, while extra cable runs can be added from the amplifier if so desired. Some decent 100W monoblock power amplifiers—one to each connection—would comprise the ultimate arrangement. If this is essentially a two-way model, you may ask with some justification, why is there a provision for tri-wiring? Well, it turns out that while one of the main drivers is a wide-range device, the other has a partial crossover to separate and attenuate its midrange output; this unit has a separate connection. Electrically, then, the system can be regarded as a three-way.

### Technical Details

The main features of this design can be seen in the cutaway drawing (fig.1). The massive, welded, steel box-section, central frame, cross-braced and welded directly to the floor platform, is the backbone of the system on which the exterior enclosure hangs on resiliently decoupled mountings. The drivers are not
fixed to the body as is usual; they are bolted to the massive aluminum plates, themselves joined to the backbone by 12 stressed alloy bars. This super-rigid assembly is also subject to much-reduced levels of vibration which normally result from magnet reaction transferred to the frame of a moving-coil driver. Three factors are at work here: two bass units are used, one on the front plate and one on the rear. Both units face forward, but the rear driver is wired in antiphase to preserve the correct phase relation for the overall acoustic output. The double-driver technique can help to linearize the excursion symmetry compared with a single-driver unit. Connected in physical antiphase, a given acoustic impulse results in the magnet reactions working in subtraction mode with the potential for a cancellation in their vibratory output. This is maximized by a tensioning bar directly coupling the magnet poles of the two drivers (also seen in the bass section of the KEF R104 II).

Thus the tweeter, mounted below the main bass/mid unit, enjoys a virtually vibrationless platform. Likewise the enclosure receives virtually no drive-frame vibration and can only be weakly excited by the indirect route of acoustic coupling from driver radiation. In any case, resonance control of the body itself is well covered by substantial internal bracing and the deeply recessed back. (Listening tests showed that with the enclosure transit bolts in the locked position, a subtle but significant deterioration in clarity occurs.) Any residual vibration in the chassis is led out via the spiked feet at the base plate. The overall result is a singularly low resonance structure for its size, one for whom the usual knuckle test on its side panels does not indicate its acoustic potential.

Balancing the considerable investment in the enclosure, the drive-units may be small but they are of undeniably high quality. For example, the two 6½" units are wide-range drivers with die-cast, magnesium-alloy chassis, long-throw suspensions, and correctly flared, polypropylene diaphragms. The rear unit operates in the lower frequency range up to 250-300Hz, supplementing the output of the front unit which works over the bass and the midrange. Above 4-5kHz, the final driver comes into action, a 1" dome based on a pure piston titanium diaphragm. This unit, with its aluminum coil former, has a high power-handling capacity and is difficult to overload. In any case this speaker system is provided with the POSITEC protection system whereby thermally sensitive solid-state resistive elements switch to a high-resistance protective state when a critical RMS-equivalent current is exceeded. So far the use of these elements has not resulted in any adverse comments for those speakers using the system, and they provide an inexpensive, reliable drive-unit protection.

The 442 represents the ultimate realization of an idea demonstrated in two earlier MS speakers, the 100 and the 300, where both system and bass/mid driver designs were tailored toward the objective of direct-coupling the main driver to the amplifier without the usual signal losses resulting from the intervention of a low-pass crossover network. Such natural driver crossover rolloffs were pioneered by Acoustic Research some years ago and have enjoyed some renewed interest in the UK. Usually, some high-pass crossover element is
required for the tweeter system, but this section of the crossover is generally easier to execute and can be accomplished using higher-quality components, thus maintaining the required performance. Direct electrical connection to a driver does result in an increased level of transparency but can result in an excessive level of upper-midrange energy. It is here that the second rear-mounted driver comes into play, reinforcing by 3dB the energy output in the bass and lower midrange.

The rear-unit crossover is based on a series inductor, giving a working range of 30Hz to 250Hz. The main driver covers the whole range of 30Hz to 5kHz without a crossover, while the tweeter is fed via a second-order network using good-quality film capacitors. The internal wiring is hard-soldered; for normal two-core speaker cable the three sets of binding posts may be strapped together.

The 35 liter volume is shared between the two bass drivers with the bass reflex section tuned to 38Hz by a rectangular duct of respectable 40x85mm exit size, this equivalent to a respectable 60mm diameter port. The sealed box resonance lies at 74Hz in this quasi-Butterworth alignment.

The "electronic" POSITEC protection gives an upper power-handling limit of 300W, though some increase in bass distortion will be inevitable at this elevated level. The moderate sensitivity indicates that amplifier powers should start at 25Wpc for modest sound-level requirements.

Finally, one minor point: the steel base plates are damped with ribbed sheets in natural rubber which I found rather smelly—perhaps this wears off in time?

**Sound Quality**

Mainly auditioned solo, the 442 also had the benefit of independent validation under blind conditions when included in a large test group of systems. They were driven by Krell KMA100 II amplification with a Cello Audio Suite Premier preamplifier, Cambridge Audio CD1 and Pink Triangle/SME V/Koetsu Red Signature sources. Cabling was van den Hul Silver, and a variety of rock and classical music was used.

This free-field speaker was planted securely out in the room three feet (0.9m) from the side walls, and its front section placed 4 1/4 feet (1.3m) from the rear wall. The floor spikes were used, and the enclosure lock bolts loosened correctly.

First impressions were of a classy sound offering considerable smoothness, fluidity, and sweetness. Tonal balance was essentially correct, a view reinforced by its consistent portrayal of perspectives and its reliable delivery on a wide range of program material.

This speaker's output sounded neutral and natural by box standards—up with some of the best, including the high-performance miniatures, though not quite in the electrostatic class if judged on grounds of coloration alone. Enclosure coloration was very low, and matched the performance of the drivers, with the chosen units clearly showing off their advanced capabilities. A lack of midrange coloration was apparent in a freedom from those false vocal effects—"shout" or "bark" or hardness—and in the speakers' ability to play at an even loudness right through the mid register. The join to the treble unit sounded seamless; it was difficult to tell where one unit left off and the other began. The treble register was also very clean, lacking the usual "nasal," "pinched," or "squeaking" sounds, and essentially free from "grain," "grit," or "sizzle." These sounds have adulterated the output of many older-generation soft-dome tweeters to a greater or lesser degree.

Younger and keener-eared listeners might detect a hint of emphasized "airy featheriness" high in the treble range which is known to be caused by the protective "phase correcting" ring over the tweeter dome. Technically this titanium dome operates as a pure piston over its entire audible working range; in the 442, it sounded as if this was true.

However, we did detect coloration in the low mid- to bass range where some hollowness in the sound was associated with a dip in energy in the low midrange. This altered the quality of bass transients, moderating the natural "crack" and "speed" associated with harmonic edges of bass transients. This took some of the body and weight from the midrange, and as a result, the bass sounded a little slower than it should—slightly detached from the main output. A mild energy emphasis was heard in the midbass, but hardly enough to be called "coloration."

Stereo images were reproduced on a big scale, well detached from the speaker positions.
and spreading outside and beyond the positional triangle.

Image focus was consistently good across the whole width of the soundstage, this quality extending some way into the depth plane. A good recovery of low-level detail and the subtle clues which can help sustain the impression of space and ambience together supported a good level of perceived depth. Indeed, the impression of depth extended a substantial six feet, though with the most transparent designs, even more depth is possible.

Self-effacing and consistently competent, this speaker was easily forgotten as a reproducer, leaving the music to take good care of itself. Rock and classical performances were handled equally well, and the general level of information recovery was high. Its abilities on musical dynamics were rated well above the average, and only when driven to high sound levels did the mildly "forward" midrange begin to cloud the balance with a hint of congestive hardness.

Sounding wide and "open," the subjective frequency response showed good extension from the high treble to the low bass, even though the bass was obviously not to the standard to be expected from a subwoofer. Low frequencies were essentially clean and articulate, with a tuneful, lively quality, and with sufficient weight to balance the midrange.

Proving easy on the ears over extended auditioning, the 442 ultimately impressed those who heard it by its essentially neutral, articulate competence.

Some enhancement in performance is available through the use of multiple wiring. First trials concerned bi-wiring using two sets of speaker cable with the option of separating the bass from the mid/treble, or separating the bass/mid from the treble. From the results obtained, the second option was the better, providing a moderate improvement in treble clarity, focus, and dynamics, and out of all proportion to the additional cost of the cable itself. A third cable allowed for an individual link to the rear driver and this gave a slightly tighter, firmer bass with a touch more speed. A little more detail was also obtained in the mid register, but while bi-amping would certainly be worthwhile, tri-amping probably would not.

Lab Report
The sensitivity came out at 87.5 dB/W which was about average and only mildly compromised by the impedance loading. With a maximum capacity of 250W, decently high maximum-sound levels of 106dB will be possible from a stereo pair in a typical living room (80m²), and 25Wpc will provide satisfactory orchestral levels of 96dB—20th row stuff. A minimum load value of 4.8 ohms was determined at 200Hz due to the paralleled 8 ohm drivers, while the load averaged 8 ohms in the 20Hz to 600Hz range—no great problem even for tubed power amps. Above 1kHz the load became rather kinder, averaging 12 ohms with a 9.5 ohm minimum at 8kHz. Taken overall, the load characteristic (fig.2) was relatively smooth and low in reactive components.

Using calibrated nearfield techniques, it was established that the 442 offered bass extension to 40Hz -6dB, and was good for 30Hz in typical rooms if not driven to overpowering sound levels.

![Mordaunt-Short MS442](image)

**Fig. 2**

Mordaunt-Short
MS442

Modulus of Impedance
(in ohms)

<table>
<thead>
<tr>
<th>Frequency in Hz</th>
<th>25Hz</th>
<th>50Hz</th>
<th>75Hz</th>
<th>100Hz</th>
<th>150Hz</th>
<th>200Hz</th>
<th>300Hz</th>
<th>400Hz</th>
<th>500Hz</th>
<th>600Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impedance (ohms)</td>
<td>8.2</td>
<td>8.0</td>
<td>7.9</td>
<td>7.7</td>
<td>7.6</td>
<td>7.6</td>
<td>7.5</td>
<td>7.3</td>
<td>7.2</td>
<td>7.0</td>
</tr>
</tbody>
</table>

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The axial frequency response curve (fig.3) has a smooth low end (dashed nearfield) confused by an axial phasing notch seen on the 1m solid line. This notch occurred at 200Hz and resulted from the time difference due to the extra path distance to the rear driver. Its severity will be reduced off-axis while normal room reflections will help to diffuse it. Nevertheless, it prevented the use of a normal specification for axial response limits. Above 300Hz, the output stabilized to a uniform ±3dB up to 20kHz, and the treble response was particularly smooth. Removal of the grille (a fine-quality grille, this, and well rebated) gave the dotted trace at high frequencies—not significantly different.

Moving out to a more realistic measuring distance, namely 2m to the microphone (fig.4), the axial uniformity was confirmed while the overall spectral balance was clearly quite well judged. With the microphone at 15° above, some phasing loss appeared in the crossover region, but this was not important (except, of course, for those listeners who insist on standing up!). In the lateral plane, the acoustic output was well controlled over the two angles, 30° and 45°. Both showed only moderate loss with good correspondence between them and the main curve. Visually integrating this set of curves suggested that the speaker may suffer some spectral dominance in the 400 to 800Hz range, evident as a touch of upper midrange lift.

A harmonic analysis for the second- and third-order components was made at 96dB and 86dB spl, Im. (The continuous input powers were approximately 10W and 1W respectively.) At 96dB (fig.5), the distortion was held at 0.3% or less above 200Hz for both second and third, and was typically 0.15% over much of the treble range. Even at low frequencies, down to 50Hz, the distortion remained below 1%—a fine result, especially considering the moderate size of the bass drivers.
Reducing the level by 10dB to 86dB spl (fig. 6), the distortion had improved considerably, with the second harmonic essentially below the 0.1% bottom line and with the third held at quite moderate values.

Finally we come to the RAR, or room-averaged response (fig. 7). The overall trend was impressively smooth and well-balanced, though there was a hint of mid dominance contrasting with the low mid depression, the latter a combination of the inter-driver delay and the floor-cancellation dip for a free-standing speaker such as this. The bass, though well-extended to 30Hz, is clearly a bit heavy at 50Hz; however, even this excess did not reach higher than 5dB above the midrange and, in the context of typical standing-wave modes in most rooms, was not considered very serious.

Conclusions
In my experience there are very few speaker systems of real competence in this price and size range. The 442 designer has managed to successfully tackle the major problem of cabinet vibration for this size of enclosure by dint of major engineering work, founded on a massive central backbone and including the floating braced enclosure, an inert, tensioned driver platform, and the resonance-cancelling mounting of the bass drivers themselves. Add in the use of modern low-coloration drive-units and the well-balanced system design, and the System 442 is clearly exceptional. On grounds
of sound quality, the results justify the effort: the system is inherently musical, informative, and relaxed, with low levels of coloration—much better than the usual standard achieved.

On the technical side, the output was mildly flawed by the inter-driver cancellation dip, though in practice this did not prove to be too much of a problem. In all other respects, the H 442 tested well, with a linear amplitude response, good off-axis results, and low distortion. It can be driven hard, and will also produce large, powerful, and well-focused soundstages.

Taking into account the worthwhile upgrade possible by multi-wiring and even multi-ampling the system, the Mordaunt-Short System 442 has a strong potential for use in a wide range of systems at prices from $4000 to $10,000. It stands with the best in its class, demanding notice and serious appraisal by purchasers with budgets in this area. While modest by the standards of larger US designs, the System 442 stands as a genuine flagship for Mordaunt-Short, and represents the successful embodiment of a number of modern ideas in a modern loudspeaker-system design.

FIVE CD PLAYERS

Thomas J. Norton surveys Philips-based machines


I probably should have titled this the "Philips CD Player Survey." Since the Philips (Magnavox in the US) players arrived on the scene, they have been fair game for both high-end manufacturers and weekend tinkerers. There are several reasons for this. The stock machines are, first of all, quite respectable sonically; not the stuff of legends, certainly, but well-received nevertheless. Secondly, they are cheap; a modifier can afford to purchase them even at discounted retail and still price the mod within reason. And third, there is sufficient space inside (especially in the newer models) for almost any reasonable modification—which means there's adequate space for an improved analog output circuit, which is the major feature of all modifications.

1 In the future, you can expect some confusion on this score: Magnavox will continue to market the inexpensive Philips players under their own brand name in the US, and will market the top-end Philips machines (used in only one mod I am aware of, from Vacuum Tube Logic) under the Philips name.
Since this is the first significant commentary on CD Stereophile's readers will have heard from this reviewer, a decent respect for your opinions on the subject requires that I attempt to make mine clear. CD is, in my judgment, neither as bad as its worst critics contend nor as good as its uncritical groupies would like you to believe. At least 75% of my listening is still done using analog LP as a program source, but market realities must be recognized. The position of CD is firmly established. CD will, eventually, replace vinyl as the primary program source for audiophiles (cassette has already done that in the mid-fi market—or haven't you been watching?) —not necessarily because audiophiles embrace it openly, but because they will have little choice.

The only question remaining is how long it will take; my prognostication (for what it's worth) is 10 years. That may be conservative. This does not mean, by the way, that I therefore advocate giving up on collecting analog LPs and upgrading analog playback equipment. Quite the opposite. But there's no use wishing CD will go away, either. It will be far more productive to work to encourage small companies producing quality analog LPs (they will likely be the last bastion), concurrently work for improvements in CD hardware and software, and actively encourage the industry to avoid sonically disastrous detours, of which Copycode is the most grievous current example.

What, in my judgment, are the most serious flaws of CD? Starting from the top:

1: Digital glare. This is the big one. Digital was supposed to free us from the distorted climaxes and crescendos endemic to average vinyl reproduction. What it did was to substitute one form of distortion for another. Instead of mistracking and inner-groove compression we got glare and hardness (especially on early machines and discs), which prompted, in this listener at least, an instant desire to turn it down or turn it off.

The best discs and machines, in my experience, don't yet completely eliminate the problem, but do reduce it to an intermittent irritation (primarily on program peaks) that I can live with (but would rather not have to).

2: Congestion. A tendency of the sound to become dense and increasingly opaque as the level of the program increases. Much improved with the latest machines and discs, and often at least a partial result of the tendency to play digital recordings at higher levels than analog. This tendency is due largely to the low noise level of CD, but may also be due to...

3: The Digital Dead. Not the latest George Romero epic, but rather a lack of a sense of air and transparency to the sound. Less troublesome to those who haven't grown accustomed to a tipped-up high-frequency response from certain moving-coils and balance their systems accordingly, but still, I feel, a complaint with some foundation. Critics also complain of a lack of low-level detail and ambience, and I had to agree with them on the early players and discs. But the low-level problem doesn't trouble me now, only the reduction in high-end air and transparency (as judged in comparison with the best vinyl played with relatively linear moving-coil pickups). Yet again (and this is beginning to show a trend), the best recent players and discs are much improved, but still have a significant way to go.

There are other CD flaws, but the above are the only ones I lose sleep over.

CD's strengths?

1: Consistent low-end weight. The best vinyl LPs can be remarkable in bass clarity and depth, but be honest—what percentage of your vinyl discs are of this quality? It's all too easy (and common) for a mastering engineer to roll off the low end when cutting a lacquer; with CD he or she is far less tempted to emasculate the sound.

2: Instrumental timbre. This one is controversial. I have read, admittedly in puzzlement, critics picking apart the CD for its distortion of timbre. I couldn't agree less. As long as the recording minimizes the flaws I have listed (especially glare—most troubling on high-level brass and voice), I find the natural weight and timbral reproduction of CD to be generally superior to vinyl.

3: Lack of noise. This really is important. It's been disparaged as a minor factor by CD's more vociferous critics, but it simply can't be ignored. 95% of classical music is performed and played back at volume levels at which noise is definitely intrusive.

4: Convenience. Again, often discounted as relatively insignificant—no one should mind changing a disc every 25 minutes or so. Tell that to an opera lover who can now listen to upward of 70 minutes of uninterrupted music. That should give you enough background on this writer's opinions to either nod your

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head in agreement or prepare the boiling oil. For those of the former persuasion, or even of the latter (but kindly souls willing to humor me), a few more preliminaries are needed before the games can begin. The matter of cables rears its head. The fact that the American Audio Labs players came with captive Straight Wire leads caused some consternation. Should the other players be auditioned with the same cable to maximize the constants? Fortunately, I had a 1m length of LSI (the cable used in the P-12) on hand. It was determined, through less than exhaustive research, that the Audio Concepts player performed at its best with this same cable, so the LSI was used in the evaluation of the latter player. The Aria, on the other hand, preferred the Monster M-1000 interconnects. So the Monsters were used for the bulk of the Aria auditions. Curiously, the Audio Concepts was less happy with the Monster cables, the Aria less happy with the LSI. Fascinating. Aren't cables fun?

And one final word on the subject of cables: power cables. All of the players were hooked up with a line-cord orientation producing the minimum stray voltage on their chassis. The measured difference was obvious with the Aria (2-4 volts in the wrong position), less definite but still determinable with the other players. CAL suggests that the wrong orientation will result in a too-bright sound. If you lack the measurement tools (an old Namiki direction finder or simple voltmeter will serve), a listening test will have to suffice. But the setting with the minimum stray voltage must be the correct setting. If a device sounds “better” with higher stray voltage on the chassis, something is wrong with either the design or the conditions of the listening test. (In my opinion, every serious audiophile should own at least a simple, cheap voltmeter and know how to use it.)

I also feel constrained to point out that all of these machines, to a greater or lesser degree, generate RF serious enough to cause subtle degradation in the reception quality of nearby televisions—at least those with indoor antennas—and, presumably, FM reception as well. (Though I could not check the latter—my sole FM tuner, a circa 1972 model of undistinguished parentage, is stashed securely away in its box in the back of some closet or other, safe from the ravages of local FM reception.) If you’re in the habit, like me, of leaving your equipment on at all times, you may encounter problems when taking a break from your Bax, Berezovsky, and Bernstein to watch Green Acres and Laverne and Shirley reruns.

Associated equipment used in the auditioning of these players included: the aforementioned cables; the Kloney SK-5a preamp; at various times the Motif MS100, PS Audio 200C (latest version), and Aragon 4004 power amps; and the Apogee Duetta II, Synthesis LM300, and VMPS Tower II/R loudspeakers.

California Audio Labs Aria:
$1595

I deliberately chose the latest version of the Aria as a benchmark for this review—a player with genuine high-end aims, but still affordable (certainly competitive in price with a moderately good, audiophile-quality analog LP player). Its price point is higher than that of the other players in this survey; that too was a deliberate choice. Three of the other players
attended were from less well-known sources, the fourth an inexpensive stock machine. I wanted to give them a difficult target.

The salient points of the Aria's operation have been well covered in this magazine previously, but a brief summary is in order for those new to these pages: tube/solid-state hybrid design, superior internal construction with quality parts, based on the Philips 560 with optional remote control, distinctive external styling that does not scream "Magnavox Mod" as soon as you open the box. Brief enough? My primary intent here is to offer my sonic assessment of the Aria so the reader can relate it to the other players on audition.

Sonically, the Aria produced the best sound from CD that I have yet had in my listening room. Perfect? Hardly. Up to the level of the best analog? Still a significant gap. Demonstrating the best qualities of CD while refusing to emphasize the flaws? Definitely.

Let's start with soundstage, an area of CD reproduction that has been much criticized. The Aria produces, with appropriate program material, a broad, deep soundstage. Not yet the equal of the best of analog, to be sure, but close enough that I never felt its reproduction of image and depth, given appropriate program material, to be anything less than excellent. Individual instruments had a real three-dimensionality. Imaging was tightly controlled between the loudspeakers and extended to the sides beyond them on those recordings producing this effect. Its overall sound had an expansiveness superior to that of the solid-state players evaluated in this survey. The latter were sometimes a bit more tightly focused, but could not quite match the open quality of the Aria. The CAL player did full justice to the superbly well-defined soundstage in RCA's newly re-released 1963 recording of Madama Butterfly (6160-2-RC). Voices and instruments were precisely placed both laterally and front to back.

The artificial but nonetheless impressive soundstage on Patrick O'Hearn's Ancient Dreams (Private Music 2002-2-P) was dramatically reproduced. (It must be noted, however, that this artist's Between Two Worlds, on vinyl, remains considerably more impressive—a simple reflection of the qualitative differences that still exist between CD and analog LP.) Both the American Audio Labs P-12 and the Audio Concepts players were also impressive in their soundstaging with appropriate recordings; the superiority of the Aria lay in its ability to combine the focus of individual instruments and voices within the soundstage with proper reproduction of the openness and expansiveness of the overall soundspace.

The Aria has a palpably alive quality through the midrange and lower treble (the brightness region) that also sets it apart from the other players. Call it "snap," call it transparency; whatever, it went a considerable way toward ameliorating the marginal lack of those characteristics that, for this listener, often characterize CD reproduction. Along with the expansive soundstage, it is clearly the most distinctive characteristic of the Aria's sound, and, in my opinion, its greatest strength.

But not in the wrong system. The high end of the Aria could be overly energetic in a system with a bright combination of associated components. It was beautifully balanced through the Apogee Duetta IIs and VMPS Tower II/R driven with the PS Audio 200C, but somewhat too energetic through the Synthesis LM300s driven with the same amplifier. Substituting the Motif MS100 amplifier improved the balance noticeably, but it was still best with the former loudspeakers. Here, as always, system matching is clearly important.

It wasn't surprising to find that the Aria was weakest in those areas where tubes have traditionally been tested by solid-state: the frequency extremes. Philips players have, in general, been less well-defined in the low end than the Japanese competition, and the Aria does nothing to reverse that reputation. In fact, compared with the other machines reviewed here (all solid-state), its low end is fuller but slightly woolly. The fullness is an advantage on bass with little transient information—the organ on Saint-Saens's Symphony 3 (Philips 412 619-2) was striking in its depth and sheer window-rattling power through the VMPS Tower II/Rs. But is low-end definition and focus were softer than that of the solid-state machines.

And at the high end, the Aria was marginally outgunned by the Audio Concepts player for extended response in the top octave and resolution of fine detail. The effect was very subtle;

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2 I have deliberately avoided reading DO's review (Vol. 10 No. 7) and LL's review (Vol. 11 No. 1) of the Aria until my own assessment was complete. (DO's was an earlier version. LL's sample is of the same vintage as mine.)

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the Aria was by no means obviously rounded or lacking in definition. But those who are not won over by the snap and liveliness of the Aria's upper midrange/lower treble may prefer the somewhat sweeter overall sound of the P-12 or the very slightly more airy and detailed extreme high end of the Audio Concepts. But, for me, the Aria won out for its overall combination of HF detail and life, and I was only occasionally bothered by its low-frequency softness.

The Aria was also superior to its competition in its ability to minimize the hardness that CD reproduction often exhibits, particularly with respect to glare at high levels. It did not eliminate it—the jury is still out as to whether this is an artifact of the CD system itself or of existing discs and players—but with the Aria I was troubled less by this irritation than with the other players here. It was not still possible to completely ignore it—it remains, for me, the major failing of CD—but with the best recordings on the Aria it became merely an occasional annoyance.

For this listener, the Aria is the winner of this face-off. A higher price doesn't always translate into sonic superiority, but this is one case where it does. The Aria proved to be a target that the solid-state players couldn't quite hit.

**American Audio Laboratories P-12: $900**

American Audio Laboratories is a South Carolina-based company offering modifications to several Magnavox (Philips) CD players. In addition to the P-12 (based on the 650) and P-9 auditioned here, there's the P-11 (a modified 560). They also offer an interesting, rather elaborate mod of the Dahlquist DQ-10 which may be of interest to owners of that now-classic loudspeaker.

The P-12 begins life as a hand-selected (according to AAL's literature) Philips CDB-650. AAL is apparently part of a retail dealership which also sells the untweaked 650; units which make the cut in tracking ability, error correction, and servo-locking performance are eligible for modification; others are returned to be sold as stock machines. The modification consists of upgraded parts, power-supply regulation, and a new analog output stage dubbed the Resonant Free Output Module. The resonant-free aspect involves completely potting the output circuit in a block of wood-like epoxy material. This encapsulation may or may not have sonic benefits, but it pretty well eliminates any comment on what may or may not be inside (as a critic, I dislike encapsulation—I'm incurably nosy).

AAL believes in minimizing circuit connections; to that end the P-12 comes with captive output leads of Straight Wire LSI interconnect cable. (Price comparisons of the P-12 with other players should take into consideration the inclusion of this ca $80 cable.) All of the features of the basic 650 machine remain, including remote control. Short TipToes are also permanently attached to the P-12. They will scratch cabinet surfaces and the top plates of other equipment, so the user should exercise caution when placing the unit. The voice of experience is speaking here; these short TipToes don't feel sharp (as do the large ones), so don't be fooled, as I was, into believing they can't mar furniture. You might not care, but, for some, domestic survival might hang in the balance.

The P-12 may be chosen from a hand-selected 650, but that doesn't mean flaws can't slip through. My sample refused to properly load the HFN/RR Test Disc (HFN 003), giving me an error code on the first several attempts. It would eventually play it, but I had to go through the same drill every time I attempted to boot up—er, play3 this particular disc. It was the only disc that ever gave me any prob-

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3 Too much time with the old word processor.
lems with the P-12, but the same disc played without incident on several other players. The flaw was almost certainly in the basic 650, not in the AAL mod.4

Of the CD players under review here, the P-12 arrived first and has been in use the longest. In fact, you might say it was the inspiration for this survey. I was very impressed by its performance and had the urge to see how it would compare with some of the other modified units on the market. It compares very well, but, as we'll see, it might not be your cup of tea.

The P-12 is distinguished by its soft, sweet, yet detailed high end. Of all the players in this survey, it has the least immediately impressive high-frequency response. The detail is there, but it's more subtle and less overt. Whether or not this strikes you as inaccurate will depend in large measure on the balance of the remainder of your system. When the P-12 was used with the Synthesis LM300s, a loudspeaker with a rather bright, forward character, the overall balance was fine. Not equal in detail to the best of analog, yet not at all irritating. With the sweeter high-frequency balance of the Duettas IIIs and the VMPS Tower II/Rs, the P-12 came across as slightly lacking in openness and a bit veiled, especially in comparison with the Aria and Audio Concepts players.

Imaging and depth of the P-12 were both very good. Imaging bordered on the excellent; the AAL doesn't equal the Aria in depth and breadth of its soundstage, but I was never overtly aware of any serious lack of these characteristics when listening to the P-12 without direct comparison with other players. Voices and instruments floated freely between (and sometimes beyond) the loudspeakers with no tendency to bunch up or cluster at the speaker locations. But the overall soundstage focus was a bit short of the superb definition of the best players in this survey, and depth slightly shortened. I feel this to be a simple result of the P-12's somewhat soft high-frequency response, not any arcane phase characteristics or mysterious gremlins. Up to a point, improved high-frequency definition will tend to sharpen imaging and depth; go too far beyond that point and the result will be excessive brightness and a soundstage that again deteriorates.

The low end of the P-12 was good. Not remarkable, and not as well-defined as the better Japanese machines, but reasonably tight and detailed. Among the units in this survey, it fell between the Aria and the Audio Concepts in overall quality. Less robust and deep than that of the Aria, it was definitely better defined. It didn't, however, have the gutsy, lively bass quality of the Audio Concepts.

I confess to some ambivalence in my conclusions on the P-12. It served well for several months before the Aria and Audio Concepts arrived for evaluation. I was always aware of its slightly soft high end and focus in comparison with analog LP, but felt it to be a worthwhile tradeoff — the P-12 never sounded hard or harsh (except for that CD trademark — glare on program peaks — where the P-12 was certainly better than anything I had lived with to that date, though not the equal of the subsequently auditioned Aria). It was an easy CD player to live with, its most significant flaws subtractive and simple enough to tune out. But ultimately didn't provide the level of involvement with the music obtained with the Audio Concepts and, to an even greater degree, the Aria.

I can recommend that you audition the P-12, especially if your system, particularly your loudspeakers and/or room, tend to a brighter-than-normal balance. You might well find, as I did in my early experience with this unit, that here at last is a CD player you can feel comfortable with. But you might, conversely, find lacking a bit of the snap and focus you're looking for from CD (minus, you hope, the excesses that CD is only too ready to provide with the wrong program material/player/system combination). Ultimately that was my conclusion. A rather reluctant one, I must admit, because the P-12 did provide many hours of enjoyable listening before it met its match, and then some, in the Aria and Audio Concepts players.

American Audio Laboratories

P-9: $700

The American Audio Labs P-9 is the baby brother of the P-12. It is based on the Magnavox 460 chassis and does not come with remote control. Like the P-12, it also has captive

4 Julian Hibsch apparently had a similar problem with his sample of the 650, but wrote it off as a pre-production glitch. It was not, though it is apparently rare.
leads by Straight Wire, but they are the latter's less expensive Flexconnect.

I'll be brief with my comments on the P-9, as I consider it a definite step down from AAL's P-12. It is slightly softer in focus than the latter player, less forceful and dynamic. The bass of the P-12 is superior, its high end more transparent, its overall perspective more three-dimensional. The P-9 is very listenable, a characteristic it shares with its bigger brother, but it does have a trace of artificial "edge" which the P-12 avoids.

I can't help wondering how much of the sonic difference between these players is due to the different interconnects used. The analog output module used in the P-9 has a different designation from that of the P-12 (OM-10 vs OM-12), but since both are completely potted, it is impossible to assess the differences in the circuits. But the sonic differences were similar, in degree, to what I would expect with better cables. It isn't reasonable to expect an $80 pair of cables with a $599 CD player, but AAL should consider substituting a pair of good output jacks and letting the listener decide on the cables.

Magnavox CDB 473: $399
If I chose the California Audio Labs Aria as a sort of benchmark in this survey, the Magnavox CDB 473 was chosen to see what sort of results might be expected from a bare-bones, unmodified, stock Philips machine. But it turns out there's more to the story than that. The new 470 series marks a significant change for Magnavox in at least one important respect. Gone are the clunky, cheap-feeling loading drawers of the older players. The new 471, 472, and 473 models have drawers competitive with any on the market in solid appearance and deliberate, hefty operation. The machine itself is actually lighter than the earlier models, but that loading drawer gives a convincing illusion of solidity, and puts to rest the major criticism of the construction of the Philips machines.

American Audio Laboratories P-9 CD player
The 473 appears to have all of the features of the more expensive 650 (including Favorite Track Selection for those who feel the need), but adds remote volume control. This is not an unmixed blessing. The volume settings are rather coarse (around 3dB), and more importantly, the remote volume adds another IC-based gain stage to the analog circuits. It is my understanding that the cheaper 472 dispenses with that stage; it may turn out to be the better sonic choice, though was not assessed for this review.

The 473 performs more than respectably considering its price. But it couldn't equal the sonics of the best solid-state competition here. If I could sum up the differences in a single word, I would have to say refinement. Compared with the Audio Concepts, the Magnavox had a brighter, more etched character. It wasn't unpleasant, at least on loudspeakers with a smooth, neutral high-frequency response, but I missed the sweetness of the more expensive player. The 473 produced a reasonable soundstage with good imaging and fair to good depth, but lacked the inner detail and impressive three-dimensionality of the Audio Concepts. Nor could it equal the tight, defined bass of the latter.

But taken on its own merits, the Magnavox has to be counted a good value. Its detailing may be a bit untidy, but it isn't veiled. Its bass and soundstage may be considerably short of the state of the art, but I doubt that anyone with reasonable expectations will be disappointed in its performance. It has no high-end pretensions, but is certainly a respectable entry-level machine for the impecunious audiophile. And there is always the possibility of it obtaining a new lease on life with that Audio Concepts (or other) mod. In fact, unless you must have FTS or remote volume, I would lean toward the 472 instead of the 473. At $399 list (and often available at significant discounts), and with the temptation of a future modification ever present, it's hard to see how you can lose.

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Audio Concepts/MSB mod: $400

This might just be the one, folks. There's not much to say about its features, unless you'd like to sit through the fifteenth rundown of the functioning of a Magnavox CD 650, the unit on which this player is based. You should be aware that the player is available only from Audio Concepts; you can't, unfortunately, audition it at your local hi-fi emporium. But Audio Concepts offers a 21-day money-back guarantee on complete players purchased from them (minus $20 to cover postage). And if you already own a Magnavox 2040, 460, 560, or 650, Audio Concepts will arrange for modification of any of those models (though the money-back guarantee doesn't apply to mods, only to complete players). No word yet on mods for the new 470 series, but it's probably only a matter of time.

Internally, the Audio Concepts displays careful workmanship. The completely new analog output stage is complex but well-laid-out; high-quality parts are evident, including two Burr-Brown Bi-FET ICs, several other quality ICs, a pair of discrete transistors, and other audiophile-grade parts. The circuit board itself is glass epoxy, and clearly superior to the board Philips uses.

All told, the Audio Concepts appears to be an excellent piece of work. With two exceptions: First, alone among the players in this survey, the AC has a humongous turnoff pulse. Be forewarned: I recommend leaving it on at all times, which isn't a bad idea anyway from the warm-up standpoint. Audio Concepts might consider disabling the on-off switch which merely invites disaster, especially if there's someone around the house who might inadvertently turn off the unit. And second, on two CDs the Audio Concepts produced isolated crackling, snapping noises, sounds which apparently resulted from some form of disc mistracking, but without the skipping that often results from mistracking. It always occurred on the same discs and at the same point—the flaw was clearly with the particular sample of the original machine, not a property of the mod, and was rare enough that it would be difficult for the modifier to predict or catch. But it was caused by the player and not the discs, which did not have this same glitch when played on other machines.

When I said the Audio Concepts was the one, I wasn't proclaiming the Audio Concepts mod the overall winner in this survey. The Audio Concepts did not equal the reproduction quality of the CAL Aria, except at the frequency extremes (as already discussed), where the AC was clearly (bass) to marginally (upper treble) better defined. None of my remaining comments should be misconstrued as in any way countering that conclusion. But the overall reproduction of the AC is so good in all respects, and the price so attractive (especially if you already own one of the modifiable units), that it's impossible to ignore. It won't make you want to throw away your LPs and state-of-the-art analog player, but in my opinion no CD player is yet able to do that. What the AC provides is a player that, at a reasonable price by high-end standards, enabled me to become genuinely involved in music as generated by the better CDs.

The high-frequency response of the Audio Concepts was excellent. Fine details—brushed cymbals, guitar-fingering subtleties, other delicate percussive effects—were rendered naturally. Individual voices within a chorus could be discerned, but without exaggeration. Strings were silky on well-recorded CDs. No, the Audio Concepts did not magically remove digital glare; it was still present, but reduced to an occasional irritant, audible on hard-driving orchestral climaxes and vocal (particularly operatic vocal) pyrotechnics. We haven't arrived yet, but the AC player provided a thoroughly enjoyable top-end performance on those CDs that didn't require such crescendos, and was above average on that program material that included them.

The CAL Aria was marginally better in rendering "digital glare" tolerable, the American Audio Labs P-12 marginally worse. In its reproduction of the soundstage, the Audio Concepts was distinguished by its ability to precisely locate instruments and voices in both the lateral and depth planes. CD does not yet equal analog LP in its ability to recreate depth, but the Audio Concepts could create a convincing illusion nonetheless, combined with a first-rate image.

An excellent recording for demonstrating CD soundspace recreation at its best is The All Star Percussion Ensemble (MMG MCD-10007).5

5 The "All-Star" title is not hype. This recording includes percussionists from the Boston Symphony, New York Philharmonic, Philadelphia Orchestra, Cleveland Orchestra, Royal Danish Orchestra, and the Metropolitan Opera Orchestra. Their performance does not disappoint.
particularly the first selection, Carmen Fantasy. If the title isn't obvious, all of the works on this recording are played only with percussion; the Audio Concepts precisely located the myriad instruments, properly sized, across the space between and beyond the loudspeaker locations, with front-to-back depth to match. (This recording also demonstrates, rather dramatically, the quality of a player's high-frequency response on percussion—a test the AC also sailed through without a glitch.) The depth was also striking on Berlioz's The Damnation of Faust (London 410-181-2, highlights); on the "Descent Into the Abyss" the chorus does, at times, appear to be coming from the depths. On lesser players they appear to have climbed up a rung or two.

The AC does a good job in its reproduction of midrange timbre and transparency. If the Aria bests it in this region, the Audio Concepts, while boasting no striking characteristics to match the Aria's liveliness and expansiveness, is still convincing. Voices are open and properly resonant. Instrumental timbres are accurate—never consistently warm or lean, but varying with the program material. There is little more to comment on with respect to the AC's midrange reproduction. It simply does not call particular attention to itself, which is all that really needs to be said.

In its reproduction of the low end, the Audio Concepts is the best player in the survey. It is deep and well-defined. Reproduction of all types of bass (percussive, organ, string—string bass is beautifully resonant and gutsy) is near topnotch. I say near because I do not have in-house samples of the best recent Japanese players; JGH's comments on the latest Sony's makes me hesitate to include the AC's bass in their category. But the Audio Concepts' low end is taut and extended. It is slightly deeper than the low end of the P-12, and noticeably tighter. It is subjectively less extended than the bass of the Aria, but definitely better defined.

I suppose I'll have to say something negative about the Audio Concepts in order to get my critic's ticket punched. Though its high-frequency balance was nearly ideal in my listening setup, the wrong combination of associated equipment (including leads) could make it sound rather brighter and a bit overetched. A similar comment has been made here concerning the Aria. Again, use some care in the choice of associated components.

Conclusions
If it isn't already obvious from the text, the California Audio Labs Aria is the winner here, but not without a fight. The Audio Concepts gives it a battle, and at a price advantage impossible to ignore. The P-12 is a contender, but doesn't quite match up to the top two machines. Still, I can't overlook the fact that it provided me with considerable listening enjoyment before being confronted with the others; though it is not as strikingly well defined in a neutral system, the P-12 is more forgiving of associated equipment and recordings. I am a bit less enthusiastic about the P-9 and the unadorned Magnavox 473. But in the case of the latter machine, you can't beat the price. And then there's always the possibility of a modification...

And still there are others. This review only scratches the surface of available Magnavox-based machines. A number of others have already been reviewed in previous issues. More were intended for this review: the promising MOSFET and tube/solid-state hybrid players from Analogic were on hand, but the manufacturer called them back for an update. And more modifications from other sources are likely appearing even as I write.

Where does CD go from here? Two years ago I would have urged caution; the 16-bit machines were just coming onto the scene and the market was in minor confusion. I now see only one factor about to stir things up: the new Magnavox machines with their heavy-duty loading drawers. If the older, clunky drawer puts you off (it's part of all players reviewed here save the 473), you might want to wait until the modifiers start using the new machines. I don't see it having any impact on sound quality; the loading drawer really is cosmetic and has no effect on the disc once it's loaded. But it's a psychological barrier that may irritate a given user. I am firmly in the camp that dislikes the older drawer. But I wouldn't put off purchase of any of these machines for fear of dramatic new sonic advances in CD. I anticipate gradual refinements in players and discs over the next few years. A breakthrough or two, to overcome some of the remaining problems in the system, would be welcome. But I don't see one coming, at least not in anything short of the super-price category.

Stop Press
Item One: The above words were finalized
several days prior to the 1988 Winter CES. At that show, anybody who was anybody (at least among the Japanese companies) was showing their latest wrinkle in CD players, at least in the high end of their lines: 18-bit &x oversampling. It is, however, too early to tell if this is a genuine advance, a subtle refinement, or the latest in one-up-specmanship for its own sake.

**Item Two:** Also seen at Winter CES: a new version of the CAL Aria based on the new Philips chassis with the improved loading drawer. Stay tuned!

### FOSTEX M22RP / S M-S MICROPHONE

**J. Gordon Holt**


![Fostex M22RP / S M-S Microphone](image)

Coincident stereo miking has two advantages and one disadvantage. Its advantages are that it gives the most stable, specific imaging of any mike technique, and its outputs can be summed for mono reproduction without loss of quality. Its disadvantage is that, in most of its configurations, it tends to produce an overly narrow, shallow soundstage. Crossed figure-8 microphones produce adequate soundstage width, but their rear sensitivity makes them susceptible to audience-noise interference at live concerts, and they may pick up too much hall sound at distances which provide the best balance of sounds coming from the front.

Of all the coincident-mike arrangements, the most satisfactory and most versatile is the so-called M-S configuration, which stands for middle-side or mono-stereo, depending on who you ask. (Actually, mono-stereo is a misnomer, because it doesn’t put out a stereo signal at all; it puts out two mono signals.) An M-S mike consists of two separate microphone elements, one a cardioid directional type aiming forward, the other a figure-8 bidirectional type aiming to the sides (fig.1).

A bidirectional mike is sensitive to sounds coming from both sides, but the electrical polarity of its output depends on which side the sound is coming from. This is because a pressure wave from, say, the left side will move its diaphragm in the opposite direction from a pressure wave coming from the right side. And since there are only two possible polarities for connecting anything, only one side of the figure-8 mike can be in-phase with the front-facing cardioid mike when a sound comes from in front. As you can see, there is no way this configuration can give us a stereo pair of

![Fig. 1](image)
output signals. To do this, the outputs from the two mikes must be matrixed—added and subtracted. Fig.2 shows an oversimplified version of the matrixing network; here's how it works:

The M mike is wired according to professional convention so that a compression wave causes a positive-polarity output. The S mike is wired so that a compression from its left side also produces a positive output. When a sound source is directly in front of the two-mike array, there is output from the M mike but none from the S mike, because the latter is sensitive only toward the sides. (In effect, the opposite-polarity sides cancel sounds coming from the front.) When this is the case, the matrix puts out equal L and R signals. When the sound source moves off to the left, the M mike's output is augmented by in-phase signal from the S mike at the L output, and attenuated by the out-of-phase S signal at the R output. The L output becomes stronger than the R. When the sound source moves to the right of center, the S-mike output reverses polarity, causing attenuation in the L output and augmentation in the R output.

The electrical matrixing offers some intriguing possibilities. The amounts of cancellation or reinforcement which occur in the matrix are going to depend on the relative amplitudes of the M and S signal components. At one extreme, if we eliminate all of the S signal, we get pure two-channel mono, just as though the S mike were not present at all. And because the M mike is directional, and aimed forward, that mono sound will be very dry and lacking in hall ambience. At the other extreme—eliminating the M component altogether—we get no shared (common, or sum) information at all; the output signals are pure ambient stereo, with no front-center information. And because there is practically no pickup from in front, where the performers are, the sound will be very distant, as though the microphone is a long way back in the hall. In between those extremes, there is an infinite range of mixtures offering considerable control over the sound-stage width and the apparent distance between the mike and the performers.

M-S miking has other advantages over other coincident configurations, too. Because the cardioid mikes are aimed directly at the performers, it is not subject to the sonic colorations introduced by a directional mikes' changing off-axis frequency response. With X-Y cardioids, for example, a centered sound is in the region of both mikes' 3dB midrange-attenuation points, where HF response is typically even more attenuated than 3dB. With an M-S mike, center front is directly on the axis of the M mike, where overall frequency response is (usually) at its flattest.

The Fostex M22RP/S is a ribbon mke, but it's nothing like the fragile ribbon microphones of old; with their tissue-thin diaphragm that would blow away in a modest breeze. The "ribbon" in this Fostex mike is actually a metal-printed plastic diaphragm, more like a tiny Apogee woofer than a Magnepan tweeter. It is virtually indestructible, in fact. It also has unusually high output for a ribbon—about 10dB more than that of early ribbon designs. And, perhaps as a result, it has extremely low noise—an essential quality in this age of 94dB digital dynamic range. The mike is supplied in a very rugged, foam-lined aluminum carrying case, along with 10 feet of 5-conductor (including shield) cable and a matrix box, which latter delivers standard L and R stereo outputs. (An adaptor is available from Fostex, to allow the mike to deliver M, S, and +S outputs.)

Before venturing afield with the Fostex mike, I made some in-house test recordings to determine its imaging accuracy, setting it up symmetrically with respect to the normal loudspeaker locations in my listening room, and speaking from various marked (on the floor) locations on and off its center line. I then moved the speakers back into place, replayed the tape,

1 Microphone output ratings are not standardized and are difficult to translate. Some ratings specify open-circuit output voltage at one SPL or another, some use dB below 1 milliWatt (dBm) at 1 dynes/sq cm sound pressure, others use the same thing but at 10 dynes/sq cm. A few even use the EIA standard spec: dB relative to 1 milliWatt for a sound pressure of 0.0002 dyne/cm². Why, I have to inquire, don't they all?

Stereophile, March 1988
and noted how well the perceived images tracked their original locations. They were right on target. With the mike in the same location, I then recorded some wide-range material from my speakers and played it back through the same speakers. This is really a nasty test of the speakers and listening room, as it effectively doubles every coloration. But the reproduction was surprisingly like the "original" heard from where I placed the mike. It was
then, however, that I first became aware of a certain weakness in the mike's low end. Bass drum and bowed basses sounded a little thin.

For my final tests, I used the mike for that which it was intended: live recording—in this case, of a local symphony orchestra. Because the orchestra management prohibits the use of microphone stands during performances, I had to be content with recording two rehearsals, during which I could put a single, high stand where I bloody well pleased. The mike was placed about 15 feet behind the conductor and 10 feet higher than his head, and aimed slightly downward so the vertical axis of the \(M\) mike was targeted on the rearmost row of instruments. (The hall is a little on the dry side, but with a smooth decay free from slap or buzzes.)

The results were remarkably good. Overall, the spectral balance was quite similar to what I had heard, live, an hour or so before auditioning the playback. The sound was bright—a little weighted toward the upper midrange/lower highs, which was exactly how it had sounded in person. But there was no question about the mike's thin low end. Double basses sounded somewhat lean, and the bass drum was distinctly gutless and lacking in impact and heft. Also evident was a not-too-subtle rounding-off of highs and transient information, as though the mike was just a shade slow to react. Imaging was quite extraordinary in every way—specificity, stability, and perspective. The mike even did a very good job of reproducing depth, perhaps contrary to expectation, but then my speaker system is set up to exaggerate depth a little bit, with its electrostatic panels about 8 feet out from the rear walls.

How about soundstage width? Harry Pearson, writing in *The Absolute Sound*, has often claimed that any loudspeaker worth considering should be capable of imaging beyond the lateral positions of the loudspeakers. Since this is supposedly a physical impossibility with "normal" stereo recordings, I used to attribute what he was hearing to the SQ surround-sound encoding on the EMI recordings he usually reported hearing it from. But I have since heard it on a few *unencoded* recordings made with purist-type "minimalist" mike techniques. And I heard it again with the Fostex M-S mike.

At one point while listening to my orchestra-rehearsal tape, there was a lull in the proceedings during which I could hear two people conversing—from about 70° off center to my right! Then I remembered that they had been standing in front of the entrance doors at the right of the hall during that part of the rehearsal! I still do not know how this can happen, particularly with mikes that are as phase-coherent as coincident types, but I heard it. And, amazingly, it's firm; if you turn your head to face it, it's still there. But there was no question that the Fostex M-S mike does not compress soundstage width. In fact, its recreation of all spatial cues is as accurate as any stereo mike setup I have used. I am not equipped to play creative games with M-S signals, but I can say that Fostex's choice of matrix values is ideal for the most accurate replication of directional information. I was so impressed that I was tempted to buy the thing, and would have were it not for its other small weaknesses: the LF deficiency and overall slight lack of detail and openness in comparison with the best condenser mikes. (Some of those, such as the Schoeps Colettes, sound as if they have no upper limit; the Fostex sounds as if it does.) I didn't try the mike on pipe organ, but could only expect it to fare even worse with a sound-source capable of generating an honest, gut-shaking 32Hz.

I'm aware that the Fostex M22RP/S is not designed for perfectionist recordists, but for the film and TV user, for whom LF extension is rather low on the priority list. But this mike does so many things that critical audiophiles demand, and does them so well, that it seems a shame to have to dismiss it because it doesn't handle bass as well as some cheaper condenser types that have terrible high-end performance. Oh well, c'est la vie.

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2 Devices which allow one to adjust M-S matrixing proportions are available from Audio Engineering Associates, 1029 N. Allen Ave., Pasadena, CA 91104. Tel: (213) 684-4461.
"In the beginning was The Sorcerer. And The Sorcerer declared unto The Mouse Master that single-channel sound obscured orchestral detail and obliterated ambience. And thus it was that The Mouse Master decreed unto his Imagineers that they create FantaSound, so that The Mouse might serve his Apprenticeship in sonic integrity and musical glory."

Disney's FantaSound was both the first multitrack recording system and the first surround system. The destruction of the European film market during WW II killed it. We next hear of surround sound 30 years later. In late 1969, Acoustic Research and Vanguard demonstrated "surround stereo" on 4-channel ¼" tape.

This elicited a flurry of interest in what was quickly dubbed "quadraphonic sound." (Whether it should be "quadruplet," "quadri," or "quadro" was resolved by using the generic term "surround sound."!) Unfortunately, the use of 4-channel tape focused almost everyone's attention on that number. The problem of delivering surround sound to the home listener was seen as one of figuring out how to get four distinct channels to the listening room, rather than how to get psychoacoustically correct directionality.

A plethora of "matrix" systems—EV, QS, SQ—sprang up, each designed to shoehorn 4 channels into 2 (so as to take advantage of existing 2-channel recording technology) and unscramble them. The unscrambling was the hard part, because it is mathematically impossible to solve two equations for four unknowns. Given sophisticated decoders with logic circuitry to cancel the undesired crosstalk, one can achieve subjective channel separation of a very high order. However, such decoders arrived too late to save their respective systems.

Duane Cooper (in the US) and Peter Fellgett/Michael Gerzon (in the UK) realized that the fundamental principles of "quad"—transmitting four distinct channels, each meant for a specific speaker, with sounds positioned by panning them between adjacent channels—were totally wrong. They developed surround systems which instead transmit a mono component, plus Front/Back and Left/Right directional signals. These could be processed by a decoder to produce speaker-feed signals that created the proper psychoacoustic cues at the listener's ears. The sounds would then appear to come from the intended direction, at any point around the listener, rather than seeming to squirt out of four boxes.

Surround systems which produce correct directionality are said to be "Ambisonic," and include such technologies as binaural recording and JVC's Quad-Biphonics. The best-known Ambisonic system is called "Ambisonics."

At this point in surround-sound history, we are engaged in a great battle, testing whether David, in the form of the best consumer surround system (Ambisonics), can long endure against the Goliath of the worst-possible consumer surround system: Dolby Stereo.

For those who've been hiding for the past decade, or never go to the movies, let's briefly explain what Dolby Stereo is, and how it works.

Dolby Stereo is a matrixed quadraphonic surround-sound system. It was designed to produce crude, "obvious" effects over a large listening area, without audible side-effects. It was never intended for home use; its current popularity is due to the existence of Hi-Fi Stereo VCRs and LaserVision players (of which there weren't any in 1977, when Dolby Stereo appeared), and hundreds of videotapes/disks with encoded stereo soundtracks.

Dolby Stereo's speaker layout is different from conventional quad or Ambisonic reproduction (where the speakers form a square or rectangle). Three speakers sit across the front. The Left and Right handle stereo the usual way. The Center speaker is principally for dialog;

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1 "Quadra" is the most linguistically correct. —JA

2 Dolby Stereo actually includes many other improvements to theatrical sound, including stereo (match), reduced noise, and a wide, flat frequency response. Its home version is called Dolby Surround.
it keeps the dialog "centered" on the screen regardless of where you sit.

The fourth channel is called "Surround," and is fed to a plethora of speakers, arrayed in an arc around the sides and back of the theater. This set-up not only produces a huge, spacious sound, but keeps the level at any one speaker low enough that loud passages don't blast adjacent listeners.

These four channels—Left, Right, Dialog, and Surround—are encoded into the two optical soundtracks on conventional 35mm prints. (Larger formats, such as 70mm, have more space for soundtracks, and the four channels are recorded discretely.) Encoding is trivially simple. Left and Right are recorded as in any other stereo medium. Dialog is an in-phase, equal-level signal on both tracks. Surround is also recorded at equal level on both tracks, but anti-phase.

Decoding is equally simple. The Left and Right channels are fed directly off the film to the Left and Right speakers. The tracks are added (which cancels the anti-phase Surround track), and the mono sum is fed to the Dialog speaker. The tracks are subtracted (which cancels the in-phase Dialog track) and this difference signal goes to the Surround speakers.

That's the theory, anyway. In practice, there are several real-world problems that need electronic Band-Aids.

The first is noise. Optical soundtracks aren't especially quiet, and the Surround channel doesn't always contain material that can mask the noise. Listeners near the Surround speakers may hear this noise during quiet passages. The Surround track is therefore treated with a modified Dolby-B encoding, which (along with some of the noise) is removed during playback. The Surround track is also rolled off above 7kHz before encoding and after decoding, to further reduce the noise.

A second problem is the inherent lack of phase integrity in movie soundtracks. The film wobbles and jitters so much as it passes through the projector that significant inter-channel timing errors are created. Additional errors occur if the photocells that pick up the sound are not properly aligned. These errors become so severe at high frequencies that what ought to be in-phase becomes anti-phase. As a result, instrumental overtones and (especially) dialog sibilance spill into the decoded Surround track.

The solution is to delay the Surround track. The crosstalk in the Surround track comes from the Left, Right, and Dialog channels. When the Surround track is delayed, the sounds that are supposed to come from the front will always arrive first, allowing them to mask their unwanted appearance in the Surround track. (This is called the Haas, or "precedence" effect.) The required delay varies with the size of the theater. It must be long enough to produce at least a 20ms arrival-time difference at any point in the hall.

A third problem is the lack of separation among the four channels. Although there is full separation between Left and Right, and Center and Surround, there is only 3dB separation between signals in the Left/Right pair and the Center/Surround pair. If the Dialog speaker is to remain a distinct source for the dialog, then the dialog components must somehow be removed from the Left and Right decoded channels. And although the Surround-channel delay helps hide any Left/Right spillover into the Surround track, it would be nice if they, too, could be deleted from the decoded Surround track.

The solution adopted is to use logic enhancement. Logic circuits monitor the decoded signals and decide, at any instant, which is the loudest channel. They then inject the appropriate anti-phase signal into the other channels to cancel the crosstalk. Although this makes the separation worse in some directions, it so enhances the directionality in the "desired" direction that the brain hears it as a "real" separation improvement.

Logic-directed decoders are not new. Sansui introduced the VarioMatrix decoder for QS in 1975. The Tate System for SQ appeared in 1980. Those who have never heard logic decoders might be surprised at just how effective they can be. Muddy, confused-sounding, low-separation decoding becomes a focused presentation with a clear sense of directionality. (Of course, logic enhancement is not the "correct" way to do surround sound in the home, but that is another matter.)

3 All two-channel matrices have this problem of infinite separation between two pairs of channels, and low separation between the other two. It is inherent in the algebra of 4-2-4 matrixing. SQ depends on the decoder to enhance the separation. QS "averages out" the separation to a level of about 8dB among all channels (with further enhancement from the decoder). URI ignores the question of separation altogether, concentrating instead on correct imaging.
Where is Surround Sound Going?

I'd like to say "in circles." Would that were true. (I'll explain in a moment.) Sitting on its fat Dolby duff is more like it.

The success of Dolby Surround in the home market is a total fluke. Dolby Labs could never have anticipated the widespread availability of high-fidelity stereo sound for home video. Dolby Stereo was intended just for the theater. The things that make it ideal for theatrical use (the limited-bandwidth single rear channel, the delay, the logic-directed dialog track) make it the worst possible system for home use.

To wit: We need full directionality in the Rear, whether for surround or ambient effects. (Concert-hall ambience is not monophonic.) Similarly, we need full bandwidth to the Rear, regardless of the kind of material being reproduced. And worst of all, the Rear-channel delay makes it impossible to generate stable Side images (since the delay will cause any sounds that come "simultaneously" from the Front and Rear to be localized at the Front).

This fundamental disparity between home and theatrical listening is further aggravated by the way Dolby MP matrixing is defined. It is a four-channel system, in which four "original" channels are mixed down to two, for dematrixing and replay over four speakers.

This is not the correct way to encode surround sound. There is a better way. Instead of encoding channels/speakers, we encode the intended directionality of the original sound source. Let's assume that a sound is supposed to come from, say, 57° CCW of due Front. In MP (or SQ, or QS) there is no way to define this direction. But in UHJ or RM (Regular Matrix), there is an exact phase and amplitude relationship between the two transmission channels that precisely defines this intended direction. It is up to the decoder to create the necessary speaker-feed signals that will make the sound seem to come from this direction.

Surprisingly, such a thing is possible. If the decoding is defined in this "continuous" fashion, where every possible point around the listener has a defined encoding, and the encoding varies "smoothly" from point to point (so that there are no abrupt "jumps"), one can build a decoder that creates stable, correct psychoacoustic positioning over a wide listening area. And no logic is needed!

This is the problem with Dolby MP. It is defined in a ping-pong-pong-pung fashion, as four channels to be fed to four speakers. Although one can pan sounds along the Sides and "through the Center," these positions have no formal definition. Even if they did, I repeat that the Rear-channel delay makes it impossible to generate a stable, static image at any of the Side or "interior" points.

The solution is simple. Dolby MP can be redefined in what mathematicians call a "kernel." All positions around the listener, as well as those "inside," would be defined in a continuous, smoothly varying fashion. If these points are plotted on the surface of a sphere, with the relative amplitude of the channels as latitude, and relative phase as longitude,4 they form a circle. Hence my remark about going around in circles.

This type of definition has many advantages. Dolby mixing engineers could rationally pan sounds where they wanted them. Some theater managers want separate Left and Right Surround tracks, and a kernel definition of MP would permit them to be positioned on the encoding locus so as to be compatible with existing Dolby MP decoders. Home decoders could discard the logic and delay, producing more natural and more spectacular effects not presently possible.

Dolby MP and UHJ would be effectively married. I proposed this over a year ago to Peter Scheiber (the father of matrixing), and learned he was already working on the idea. He told me recently that a new group of people at Dolby Labs are genuinely interested in improvements, and are willing to listen to suggestions. Keep your fingers crossed.

Testing Problems?

It seems that a review in a high-end videophile magazine had thrown two of The Big Three5 surround-sound decoder manufacturers into a snit. I thus became the recipient of biweekly phone calls from Aphex, Fosgate, and Shure. "How is the review going?" "What recordings are you using?" "Tape or LaserDisc?" "Which speakers?" "What's your room like?" These conversations were useful in answering questions and clearing up problems, but discomfiting as well. Each firm was absolutely convinced it had not only the best, but the only

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4 If you're into astronomy, right ascension and declination, respectively.
5 Alphabetically: Aphex, Fosgate, Shure.
good decoder, and that careful, objective listening would unequivocally establish the fact. After reading this review, two of these firms are going to wonder just how careful and objective I am.

Which brings us to the first point. There are no standards for testing surround decoders—especially those for Dolby MP. This confusion was apparent in my first review. I tried to evenly weight all of each decoder's features, then come up with a relative ranking.

That approach turned out to be meaningless and unfair. In this review, the emphasis will be on the really important things: basic sound quality (ie, how much the decoder alters the input), and how well the decoder handles MP. (The relative weights of these two factors will lean toward sound quality. Say, 60:40.) All other features will be tested and rated, but their quality will have no effect, pro or con, on the final ranking. Readers can then make up their own minds about which secondary features are important to them, and how good they have to be.

MP decoders are significantly harder to test than SQ, QS, or UHJ decoders. Recordings for the latter systems are intended as audio-only experiences that show off the sonic virtues of each system. One does not have to plow through many recordings to discover whether the decoder is afflicted with image wander, audible crosstalk, pumping, or other side effects. Though one cannot read the producers' minds, the intended effects are usually obvious, and it isn't too hard to decide whether they're decoded correctly.

On the other hand, MP's effects are part of an audio-visual experience in which the sound is generally subservient to the visuals. The Surround track is usually quiet. It's rare for all four channels to be active, or for sounds to jump rapidly from one track to another. Unfortunately, it's precisely these things that make a decoder misbehave, and thus ease the reviewer's task of separating the sheep from the wolves.

Another problem is the lack of suitable test records. I have SQ and QS disks that test positioning accuracy, panning, and logic action, using both music and test signals; there is no comparable disk for MP. (Shure has a demonstration disk with movie excerpts, and pink noise statically panned to each channel. It's useful for setting up, but does not dynamically stress the decoder's logic action or establish an explicit reference. Shure may produce such a reference recording, but it's at least a year away.)

As we'll see when we get into the reviews, it's obvious why Dolby Licensing hasn't created such a reference recording. Dolby MP decoders neither sound alike nor behave identically. A Dolby-authorized disk that vigorously tested all aspects of decoder action would too clearly reveal the differences among decoders—and in some cases, the lack of them. (Most nonlicensed decoders do just as good a job of decoding as the licensed ones). When your licensees are laying out money for promotion, you cannot nullify the hype with facts.

To get a Dolby license (and the right to display that all-important Dolby Surround badge), you must meet certain technical standards: the Surround track must be delayed, and have the required Dolby-B processing and 7kHz rolloff. That's all there is to it! There are no Dolby standards for sound quality or decoding accuracy, even in decoders using Dolby Pro-Logic.

Testing Procedure
The problem with subjective reviewing is that it's largely anecdotal. There are few controls, and those must be attended to by the reviewer. The reviewer's credibility hinges on the reader's belief that the reviewer is careful and consistent. I've started listing the equipment I use and my test procedures, so that anyone who disagrees with my opinions will at least know how I arrived at them.

Logic-directed surround-sound decoders are the most complex signal-processing devices available. I hoped I could partly "automate" the test process by making a good choice of program material. I largely failed, and you may find the reasons for the failure interesting.

The greatest weight in the evaluation went to sound quality. I decided to use analog-mastered CDs as the program source, and run a bypass test on the decoders. This is a more rational approach than simply listening to the units and deciding which "sounds best."

The only decoder that really flunked the test was the SSI, with some very obvious aberrations and losses. (There's no point in going into

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6 The unkindest cut of all came when I rated an SQ decoder "unacceptable" because of its poor SQ decoding, when its MP section was fine. Unfortunately, we're all "learning as we go along."
excruciating detail; I have my notes, for anyone who's interested.) The others weren't too bad, with the Fosgate, Shure, and Sony showing relatively little deviation from the program source. However, the differences among these six decoders were relatively slight, and did not prepare me for the blatant differences between the Shure/Sony decoders and the rest. Scratch one test.

With all the emphasis on who has the best logic action, I wanted a recording that would show up differences in positioning accuracy on music (not just test tones). Fortunately, I had a copy of Dynaco's old "4-Dimensional" test record. It is encoded just like Dolby MP, with conventional stereo in the Front and a single Surround channel recorded anti-phase.

Now it just so happens that SQ treats the Front and Center-Back signals in exactly the same way. Playing the Dynaco disk through a Tate SQ decoder (in this case, a Fosgate 101A) should supply a reference against which the Dolby MP decoders could be compared.

Unfortunately, none of the decoders—even the non-logic ones—showed any particular decoding or positional errors. What the test did show was that no Dolby MP decoder (not even the Fosgate 3602) decoded the disk as crisply or as clearly as the Fosgate 101A. Scratch another test.

The last thing I tried was test tones from the HFN/RR Quadrafile LPs. The Front/Center-Rear identity of SQ and MP permitted me to use the LF, CF, RF, and CR test tones from the SQ test. (SQ encodes the other four "compass points" differently from MP. These tones must be ignored when listening.)

The tones are pulsed, in a "glurg-glurg" fashion that simulates musical sounds. (No doubt from one of PDQ Bach's as-yet undiscovered instruments.) This test clearly revealed audible crosstalk and spillage from all the decoders, and explained, in part, why the Dolby MP decoders didn't do such a good job with the Dynaco disk. (Need I point out that the Fosgate 101A decoded these test tones perfectly?) When I talk of "glurg-glurg" test tones, this is the disk.

One out of three isn't so hot. Still, you don't learn unless you experiment. Maybe by the next time I review surround decoders, there will be test material that makes it easier to evaluate them—and their sound quality will have improved enough to justify such analysis.

Setting up a center speaker
In my last review, I didn't test the decoders' Center-Front outputs because I didn't have a matching speaker. (Well, I could have moved one of my rear Acoustats to the Front...!) The manufacturers pooh-poohed this. "Any decent speaker will do."

Uh-uh. I've had enough experience with logic-directed decoders to know that you've got to have matched speakers, or you'll hear the logic action. This is particularly important when the speakers being "logic-directed" are in front of you. The ear is quite sensitive to subtle image shifts and degradation.

This year, the manufacturers sang a different tune. They insisted that I use identical speakers! (Glad to oblige. That's what I'd been saying all along.) Phase-Tech was kind enough to loan six PC-60 speakers (and to put up with my burning out two tweeters!). This permitted testing both the Center-Front outputs and the variety of surround modes available on several decoders. Had it not been for Phase-Tech's loan, I would not have been able to run the decoders through a comprehensive set of tests.

It's a good thing that all decoders with Center outputs have separate level-trim controls for them. When switching from 2- to 3-speaker reproduction, the mono component jumps in loudness. This error is easily fixed by switching the Center output on and off, while adjusting the Center trim control for equal loudness. (The SSL manual neglects to mention this important set-up step.)

Equipment used
Denon PRA-20002 preamp (two); Denon DC-3300 CD player; Hafler XL-280 power amp (three); Phase Technology TC-60 speakers (six); Pioneer CLD-900 LaserVision/CD player; Discrete Technology Silver-Plus interconnects; Discrete Technology 312SC speaker cables

Reference Recordings
These were not the only recordings auditioned. However, they all have specific sections that expose various aspects of decoder behavior. (All movies are on LaserDisc; do you think a serious audiophile buys video software on tape?!) • Clash of the Titans: If I could listen to only one MP selection to judge decoders, it would be the first eight minutes of this film. The opening scene includes dialog, with waves
crashing all around—both Front and Surround. When Zeus addresses the other gods, there are many subtle effects, including a nearly inaudible chorus in the Surround track, and a delicate panning of voices away from dead-center. Sir Larry has salivary problems, producing severe Dialog-to-Surround sibilance splatter at one point.

- The Empire Strikes Back: In the opening scene, the probe rockets move both from Front to Rear, and from Rear to Front. Many decoders—including Dolby-authorized models—don't get the movement right. One direction will sound convincing and the other won't.

- Raiders of the Lost Ark: The fight in Marion's bar has almost continual yelling, hitting, shooting, and hollering from the Surround track.

- Star Trek IV: The Journey Home: The entire sequence of entering and returning from time warp.

- Dynaco 4-Dimensional Demonstration Disk: This record has a single Rear channel, encoded anti-phase, a la Dolby MP SQ treats Left, Center Front, Right, and Center Rear the same as MP. Playing this disk through a Tate SQ decoder supplies a reference against which Dolby MP decoders can be judged.

- Ella Fitzgerald: various CD reissues of the Songbooks. These have a Center-Front soloist with continuous stereo music. They're great for testing Dialog logic action.

- Hi-Fi News & Record Review Quadrafile, SQ side, band 3: a "glurg-glurg" signal simulates musical dynamics. This sound is panned around the room with verbal call-outs of position.

The following three recordings were used to test ambience extraction:

- Nimbus 5004: Equale Brass, Bacchanades. This SoundField recording contains properly encoded ambience. If a decoder is doing its job well, the results should sound a lot like what comes out of an Ambisonic decoder.

- Hyperion 66059: A Feather on the Breath of God. One of Tony Faulkner's "phased-array" recordings. It decodes well through many surround processors, giving any processor "the benefit of the doubt."

- Sheffield Lab 24: The Firebird Suite, Prelude to the Afternoon of a Faun. The opposite of the Hyperion. A dry, single-point recording. Any ambience extractor that works with this recording...

Dolby Decoder Features

Unlike preamps, which share many common features, regardless of quality or price, there is no "standard" surround-sound decoder. Features and functions vary so widely from model to model that anyone trying to make a rational choice is likely to become thoroughly confused.

Therefore, instead of a product-features "bulk listing" with each review, I've discussed them separately in this section. No evaluations (pro or con) are given; you'll have to read the reviews. But it should be easier to decide which features you want, then select the decoder that best meets your needs and an acceptable level of sound quality. The listing is alphabetical.

Aphex ESP-7000: $995

Aphex is the only major manufacturer of surround-sound processors that refuses to kowtow to Dolby Licensing Corporation. The ESP-7000 depends solely on logic action (plus a trick or two) for good separation. The delay and Dolby NR required for Dolby licensing are not used. Consequently, the ESP-7000 does not sport the Dolby Surround badge.

Besides the usual Left, Right, and Left/Right Surround outputs, there are logic-directed Front- and Rear-Center outputs. Plugging a cable into these jacks tells the decoder to create the appropriate logic-directed signal. To turn off these speakers, you must pull out the cable, a slight inconvenience. The 7000 has a subwoofer output (of unspecified crossover frequency). There is no complementary rolloff
on the main outputs. There are trim controls for all seven outputs on the rear panel.

There are few controls on the ESP-7000; almost everything is run from the cordless remote control (supplied). Aphex’s remote is more nearly “complete” than anyone else’s: It turns the 7000 on and off, varies volume, Left/Right and Front/Back balance, and mutes the outputs. (A pair of LEDs shows the relative volume level, while a diamond-shaped array of four LEDs shows relative channel balance. There is no display for logic action.)

The remote selects mode (Music, Cinema, or Bypass), and the “vigor” of the logic enhancement. The latter is shown by a row of three LEDs. When all are off, there is no logic action. Pressing the Separation Enhancement button lights one LED with each press. All three LEDs lit indicates the most vigorous action.

The remote can switch in the tape monitor. With the optional Input Switcher, one of six A/V inputs may be selected, with the corresponding video signal sent to your monitor. Another option, the Master Power Controller, switches power to your complete A/V system when the 7000 is turned on. An unusual feature is DSR—Dialog Scatter Reduction.7 Since the 7000 does not use delay to mask crosstalk, it needs some other method to reduce sibilance splatter. Activating DSR (shown by a front-panel LED) reduces sibilance in the decoded Surround tracks.

The remote is almost as sturdy as Fosgate’s (QV). Its body is metal and the switches are of the “bubble” type, sealed under an identifying cover sheet. Only the end panels are plastic.

Like most decoders, the 7000 has a front-panel Input Balance control. Pushing the Calibrate switch to the left sends only the Left/Right difference signal to the speakers. You adjust the Balance control for minimum sound, and the decoder is calibrated.

**Fosgate DSM-3602: $799**

The 3602 is Fosgate’s top-of-the-line decoder. It comes in four versions, representing all possible combinations of having/not having gold-plated jacks and a built-in stereo amplifier. The silver-plated/amplifier-less version was sent for review. (Built-in amplifier and gold-plated jacks add a total of $200 to the price.)

There are two other decoders in the Fosgate hierarchy, which were not reviewed. The 3604 is essentially identical to the 3602, except it drops the four A/V inputs and the Side speakers. The modes are the same, with the 3604’s Rear outputs duplicating the Side outputs on the 3602. The 3603 is further simplified, dropping the IR remote and Dolby-authorized processing in the Surround channels. Instead of delay, the 3603 depends on logic action and frequency contouring to achieve good Front/Back separation. The 3603 has the least circuitry between input and output, and considered on basic sound quality, Fosgate feels the 3603 is their best-sounding decoder.

Both the 3603 and 3604 have a built-in 40Wpc power amp; it isn’t an option. All Fosgate decoders, regardless of price, have full-logic decoding, a logic-directed Dialog channel, and a bass boost control.

The 3602 is unique in having five inputs. One is of the usual sort that connects to your preamp’s tape-out jacks. The other four connect directly to the audio outputs of video equipment (TV tuner, VCR, LaserDisc). And get this—all five inputs are audio-visual. Each has a separate input jack for a video source that switches with the audio.

The 3602 has the widest variety of decoding enhancements of any of the decoders reviewed. Besides enhancement for Mono sources, there are three Stereo Stage Width settings, labeled Normal, Medium, and Wide. These are best understood in terms of Fosgate’s six-speaker set-up: two each at Front, Side, and Rear.

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7 Am I the only old fogey who remembers Allied Radio’s "Dynamic Sideband Regulation" on their FM tuners? Deja vu! (The acronym, at least.)

*Stereophile, March 1988*
Regardless of Stage Width setting, the Rear speakers *always* carry the Dolby Surround track. (This is the Left/Right difference, with delay and logic enhancement.) The Normal setting sends the same signal to the Side speakers, to spread the Surround track over the widest possible area (as in theaters). Normal is the basic setting for Dolby MP decoding.

In the Medium setting, the Side speakers receive the same Left/Right difference signal, but *without* delay or enhancement. This broadens the stage somewhat, and provides an additional source of ambience extraction.

In the Wide setting, the Left and Right input channels are expanded to cover the four Side and Front speakers. (This is identical to the way most surround-sound decoders expand stereo, except the outputs that would "normally" go to the Rear go to the Side speakers.) The Wide setting requires use of Side speakers, or the extreme Left and Right audio components will be lost. Also note that, without the Side speakers, there is no difference between the Narrow and Medium settings. The 3602 can be used without Side speakers, of course. The Side outputs should be seen as a potential enhancement, rather than an "obligation" to buy two more speakers.

Besides the input selector and mode switch, the front panel also has switches to turn Dolby Surround processing on and off and to activate the logic-directed Dialog speaker. The 3602's decoding and logic action are optimized for Dolby MP material. If regular stereo recordings are played with the Dolby Surround switch engaged, there may be a slight reduction of stage width.

There are the usual controls for input level/balance and Surround level. Surround channel delay is continuously variable. There is a bass boost control (up to 18dB) to compensate for limited-bandwidth program material. The frequency of maximum boost is not specified. The manual says it rises as the boost is increased, to prevent over-driving small speakers.

There are a number of LEDs. Two show activity in the Dialog and Surround tracks, a third shows that the 3602 is receiving commands from the remote control, and an array of five provides a bar-graph display of input level.

An internal jumper permits the power amplifier to be fed either from the Side or Rear outputs. (The Side and Rear outputs are always available at the rear-panel jacks, whether or not you use the built-in amp.) If your 3602 does not have the power amp, the jumper has no effect. The level-trim controls for all seven outputs are also internal.

The 3602 comes with a cordless remote control that raises or lowers overall volume and varies Front/Back balance. It can mute the decoder, and return all level settings to a reference position, should they get too far out of balance. None of these functions are duplicated on the decoder, so you should take good care of the remote. (Alone among these decoders, the 3602's remote control is fully metal-cased. Fosgate claims it will survive a direct pedal assault.) According to the manual, the remote control is "keyed" to the decoder it comes with, and will not work with other Fosgate units.

**Sansui DS-77: $400**

The DS-77, with its integral power amp and wide range of controls, surround enhancements, and signal processing, is sort of a do-everything surround-sound conversion for budget systems.

There are the usual controls for Input Level, Surround Level, Master Volume, Front Balance, and Surround Balance. Three rows of LEDs display Left/Right levels for Front and Surround, as well as Center Front level. There are four operating modes, selected by pushbutton. Simulated Stereo synthesizes stereo from mono. Stereo Hall extracts ambience. QS Surround creates a "wraparound" effect, using QS decoding. (Alas, there is no QS VarioMatrix enhancement.) Cinema Surround is optimized for Dolby MP decoding. (The DS-77 does not have delay or Dolby NR, so it is not a licensed
Dolby Surround decoder. In the “budget” market, that takes guts.)

Three additional switches select the tape monitor, bypass the surround processing, and switch the internal power amp to either the Front or Surround channels.

Two unusual features (for surround processors, at least) are the Super Bass Synthesizer and the Peak Attacker (sic; they mean unlimiter. Or are they thinking of Edmund Hillary?). These can be independently switched in or out, and have controls to vary the level of the effect. LEDs show the dynamic action of these circuits.

The DS-77’s input arrangements are unusual. There are two sets of jacks, creating a feed-through arrangement. The signal not only goes into the DS-77, but comes out to feed other equipment. There is a matching feed-through for a video signal, even though the DS-77 does not switch or process video.

Another unusual feature is the way the DS-77 handles mono inputs. If there is only one cable, and it is connected to the Left input, it feeds both channels. This feature eliminates your having to run down to Radio Shack for a Y cable.

The DS-77 has a Center-Front output with its own level control. However, it is a simple blending of Left and Right; it is not logic-directed. The DS-77 does not come with, or have, a remote control.

**Shure HTS-5200: $1000**

Shure emphasizes that the 5200 is not a “do-everything” surround processor. It is intended to decode Dolby MP as accurately as possible, without (in Shure’s mind) unneeded bells and whistles. This is reflected in the simplicity of the front-panel controls. There are three mode switches, for mono, stereo, and Dolby MP-encoded sources. A fourth switch cancels surround processing and a fifth selects the tape monitor. There are the usual input level and balance controls (along with their associated LED displays), as well as master volume and surround level adjustments. A five-LED display, showing the relative levels of the five decoder outputs, and an LED that is lit when the outputs are muted, complete the front panel.

The 5200 has a logic-directed Center-Front output. It is activated by sliding a switch on the rear panel. There is also a subwoofer output, which is active all the time. Its crossover frequency is 80Hz, with a low-pass rolloff of 12dB/octave. The main speaker outputs are full-range; they have no complementary rolloff.

On the bottom of the 5200 are access holes for seven trim controls. Six affect speaker outputs — Left and Right/Front and Surround, Subwoofer and Center Front — while the seventh varies the degree of stereo synthesis in Mono mode.

The 5200 comes with an infra-red remote control that adjusts overall volume, surround volume, and can mute the outputs. There is a rear-panel jack for an optional wired remote control that performs the same functions. The optional HTS60RX remote extender permits using the IR remote control when the 5200’s sensor is blocked or not in line-of-sight from the listening position.

**Sony SDP-505ES: $700**

The instruction manual for the Sony, as well as the shipping carton, vanished into the Black Hole in Gordon’s basement. We have been unable to locate them. Therefore, if I miss something in the description, or don’t do full justice to this unique product, I sincerely apologize to Sony.

The SDP-505ES is basically a delay system. The delay is digital, in the standard 16-bit, 44.1kHz PCM format. The SDP uses the Haas (or precedence) effect to extract ambience by presenting the Frontal sounds to the sides of the listener, but delayed at least 20ms. Devices of this sort were common in the early days of “quad” (you can find a construction article in The Audio Amateur). The best-known commercial unit was the Benchmark Acoustics.
ARU system. The '505 includes basic (non-logic) Dolby Surround processing to widen its market.

There are five operational modes. The basic mode is Presence Delay. This simply delays the sound to the Rear (or Side) speakers. The default delay settings are 20ms on each channel. There are three surround modes, marked Matrix, Hall, and Simulated. These combine matrix processing (of an undefined type) with varying default delays. Matrix has zero delay, Hall is 30ms, and Simulated is 15ms. The fifth mode is Dolby Surround, with a default delay of 20ms. These delays may be varied, of course. The Left and Right delays are shown on a large vacuum-fluorescent numerical display. Each display has its own pair of buttons, marked "+" and "-". Lightly pressing a button varies its associated delay in 0.1ms steps. Firmly pressing the button changes the delay much more rapidly—about 3ms/s. Maximum delay is 90ms.

Selecting a surround mode calls up its associated default delay. If you want a different delay, it may be varied with the +/- buttons. Or, you can recall a delay setting by pressing one of the three Time Memory buttons. A delay may be stored in memory by pressing Set, then the appropriate memory button. Memory is retained even when the SDP is turned off or unplugged.

The SDP has the usual controls for Input Level & Balance, Surround Level, and Master Volume. A series of three LEDs shows input level and overload. An unusual feature is the Test Tone button. It injects an identical noise signal into both inputs, while flipping the phase of one channel every half second. In Dolby Surround mode, this causes the sound to jump between Center Front and Center Rear, which simplifies setting the Front/Back balance.

The SDP has a Center Front output, but it's a simple Left/Right summing; it is not logic directed. There is, however, an integral 14Wpc amplifier, with outputs for two pairs of speakers. A front-panel knob selects between the pairs, or shuts both off.

The SDP does not come with a remote control, nor is one available.

This is a most unusual product. Those "purists" who find even the idea of surround sound anathema should read the review carefully. It may be just what they're looking for.

SSI Products SSI-720: $600

Although I received this product from Surround Sound, Inc., they are now under new management and call themselves SSI Products, Inc.

The 720, similar to the decoders Aphex was selling several years ago, is primarily a logic-directed decoder that adds delay and Dolby NR only for Dolby Surround. Other than the power switch, there are no controls; everything is run from the cordless remote control (supplied). It selects the mode (Dolby Surround, Music Surround, Mono Enhance, By-pass), switches to the tape monitor, and adjusts the delay (from 10 to 30ms in 5ms steps). It can also raise or lower the volume, alter Front/Back and Left/Right balance, and mute the decoder. If you lose or break the remote, you are limited to Dolby Surround at 10ms delay.

The 720 has more than the usual Left, Right, and Surround outputs. There is a low-pass output for a subwoofer (frequency unspecified), and a logic-directed Center-Front output. All outputs have individual trim controls on the rear.

There are four LEDs on the front panel, in a diamond pattern, which show the relative
levels of Left, Right, Dialog, and Surround. Another five LEDs show the amount of delay selected in Dolby Surround and Mono Enhance modes.

The SSI has a unique way of switching the logic action. Shoving a cable into the Center-Front jack closes a switch in the jack, telling the decoder you want a logic-directed Dialog signal; the decoder obliges. The only disadvantage of this arrangement is that listening without the Center-Front speaker requires you to yank a cable from the rear of the decoder, rather than pushing a button on the front. No big deal.

**Yamaha DSP-1: $949**
The DSP-1 is primarily an ambience-synthesis system, with an officially authorized Dolby Surround mode that may have been added as an afterthought. I reviewed the DSP-1 in June '87 (Vol.10 No.5), but only as an ambience system. Hordes of people have asked me about its Dolby-decoding abilities. I’ve included the DSP-1 in this review to satisfy both of them.

The DSP-1’s digital processing supplies the delay needed for Dolby-authorized processing. The default delay is 20ms, but it may be varied over the range of 15.0 to 30.0ms, in 0.1ms steps. Other than the Front/Rear balance adjustment and effect-level setting, which are available in all the DSP-1’s modes, there are no other user adjustments.

**Sound Quality:**

**Center-Front speaker output**
Six of the seven processors reviewed have an output for a Center-Front (Dialog) speaker. Two of these (the Sansui and Sony) use passive outputs that are just a simple summing of Left and Right. There is no logic action to direct mono components to the center speaker. Therefore, they are unable to stabilize Center-Front sounds for off-axis listeners. The only practical use of these Center outputs would seem to be to run a mono signal to another video system.

The other four decoders (Aphex, Fosgate, Shure, and SSI) do have logic direction. When the Center-Front output is engaged, logic circuitry directs the Dialog (or, more precisely, any strictly mono component in the input) to the Center-Front speaker. The intent is to duplicate the Dialog speaker in theatrical systems. Though bachelors and small families have little need for this feature, those with projection systems and large audiences will find it useful. The Center-Front speaker stabilizes the Dialog at the screen, no matter where a listener sits.

The Center-Front output is not just the static sum of Left and Right. It is dynamically generated by selectively cancelling the Left-only and Right-only components that are not part of centrally panned sounds. (These Center signals are usually just Dialog, but may include musical instruments or sound effects near the center.) The technique is the same as that used by all logic-directed decoders (such as QS VarioMatrix or Tate SQ), and the results are subject to the same side-effects, such as “pumping” and image wander.

How does one test the Dialog speaker’s effectiveness? If one sits on or near the median line, there is no need for a Center speaker. Therefore, this third speaker is best judged off-axis. I decided to listen at a point in-line with the Right speaker, and a bit further back than the distance from the Center to the Right speaker. Although this is an extreme position, it’s not impossible, given a large audience and a projector with a wide viewing angle (such as those from Barco and Kloss that use conventional screens).

I first played several mono tracks from the Ella Fitzgerald CDs. As expected, all four decoders passed this test. (They should have, since they had nothing more than an unadorned

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8 With all these decoders, the switching is manual. If the Center-Front logic were always active, the mono component would be cancelled from the Left and Right outputs even when you weren’t using a Center-Front speaker. Presto! Instant hole-in-the-middle!
mono component to deal with!) The sound remained firmly fixed at the Center speaker, regardless of signal level. There was no wander, nor any sibilance splatter to the Right or Left speakers.

During these mono-only tests, I tried disconnecting the Center speaker. Though one would never do this under normal conditions, it does allow one to hear the artifacts of the logic action in the Left and Right speakers.

The Aphex, Fosgate, and Shure decoders had low crosstalk levels. The crosstalk was clean and did not vary much in level. The SSI was alone in having rather high crosstalk levels, which "pumped" quite a bit. Although these effects were not audible under even the extreme test conditions I had chosen, this is not good performance for a logic-directed decoder handling a mono input!

I then switched to the stereo bands, a much more difficult test. The decoders now had to isolate just Ella Fitzgerald's voice (and any centered instruments) in the Dialog speaker, without mispositioning anything else.

In one sense, all the decoders failed this test. There was a slight (but noticeable) contraction of the soundfield, and a loss of air and openness.9 The First Lady's voice (now coming directly from a speaker, rather than being a phantom image generated by the Side speakers) took on a somewhat boxy and constricted quality, even though the Phase-Tech speakers don't themselves sound like that.

In terms of extreme off-axis listening, all four logic-directed decoders did a good job. Ella was localized at the Center speaker, without sibilance splatter or audible pumping. Both the Aphex and Shure sometimes showed some Center wander, with loud sounds to the Left or Right pulling the sound a bit away from the Dialog speaker. This can hardly be considered a fault, considering the extreme test position. It also shows that the logic action allows prominent Left and Right signals to gain control. This is desirable if loss of ambience and reduction of stage width are to be minimized.

If you're going to use a Dialog speaker, the Aphex, Fosgate, and Shure are the preferred decoders. The SSI's logic action, though not audible on material I auditioned it with, is too sluggish and uncontrolled. Given poorly mixed or unusual program material (and such does exist), it seems more likely than the Aphex, Fosgate, or Shure to misbehave.

Don't forget to turn off the Dialog logic when you don't need it (such as when you're listening by yourself)—you'll get better ambience and imaging.

Sound Quality: stereo synthesis

When a mono signal is played through a stereo speaker pair, the sound appears to emanate from a tiny point midway between the speakers. Some people find this aurally irritating. Others just can't stand listening to anything that isn't stereo, and need some "sonic seasoning" to make mono reproduction palatable.

Several of the decoders offer some form of "enhancement," to give mono some of the spatial properties of stereo. I used some mono tracks from Ella Fitzgerald CDs, and a Franklin Mint LP of the Toscanini Dvorak 9th to test them. Here's how they stacked up.

Last year, I felt the Shure HTS-5000 had the best stereo synthesizer. Although its effects weren't exactly spectacular, neither were its colorations. The other synthesizers simply introduced too many side-effects to be acceptable.

This year, things are different. The other decoders with this feature are far less colored, and the Shure HTS-5200 introduces so little spatiality or image expansion as to be almost useless. If stereo synthesis is vital to you, the Shure is not the ideal decoder.

The Fosgate has an unusual approach. Instead of manipulating the mono signal, it sends it unaltered through the Front channels (or Dialog speaker). It also feeds the Rear speakers with two different delay times. This produces a very pleasing "presence" effect, where the sound appears to be "in the room." (It is often found on digital processors, such as mode 13 of the Yamaha DSP-1.) It is not, however, stereo synthesis.

The SSI uses its delay line to create a comb filter. The delayed mono signal is added to and subtracted from the undelayed signal to produce "left" and "right" channels with complementary peaks and dips in their frequency response. This technique, which has been known for at least 30 years, enhances apparent

9 This is not altogether surprising. The process of dynamically cancelling the unwanted "crosstalk" causes slight level (and possibly phase) shifts that upset the delicate information needed for full ambience perception. I once tested a dynamic range expander that independently expanded the Left and Right channels. It, too, showed a loss of air and dimensionality, since the Left/Right levels no longer exactly tracked.
depth and widens the sound field, even to the point of sometimes creating plausible directional effects.

The SSI has 5 delay settings, of 10, 15, 20, 25, and 30ms. The two lowest settings give a good spread and some directionality, with reasonably low coloration. At higher settings, the delay becomes audible as an increasingly obvious echo.

There was a thinning-out of the low end on the Toscanini recording, probably due to acoustic cancellation. (This effect would vary with the distance between the speakers and the amount of delay.) Surface noise was slightly accentuated, but drums and cellos had a strong sense of directionality. The overall quality was judged to be slightly more mechanical or artificial than the unprocessed sound. Still, the SSI did a very good job of turning mono into faux stereo.

The best of the lot was the Sansui DS-77. Its effect with both classical and pop was open and “splashy” (I can think of no other word), with big gains in depth and directional specificity. The Toscanini sounded especially good. The enhancement did not exacerbate this recording’s colorations, a common problem with stereo synthesizers. On the negative side, the image was slightly phasey, and Ella’s voice lost some of its focus. There was some sibilance spill to the Left channel. These were judged minor flaws.

The DS-77 is aimed at a budget marketplace, whose less-sophisticated listeners are less tolerant of mono sound. How nice that Sansui has given them a really good synthesizer.

The three “recommended” decoders are reviewed first. The four remaining decoders are then reviewed in alphabetical order.

Sound Quality: Shure HTS-5200

All Dolby MP decoders are alike in that they decode Dolby MP-encoded sources. The Dolby Surround logo suggests that all decoders so equipped will sound alike, or at least meet some minimum level of performance. Manufacturers know, however, that you cannot sell a product on the basis of how much it is like a competing product. You must create a difference in the buyer’s mind. This is called “product differentiation.”

Among Dolby MP decoders, you’d think the rivalry would be over basic sound quality, or even features. It isn’t. The most raucous claims are about decoder logic action.

This emphasis is the result of the way Dolby MP-encoded films are mixed. Dolby makes a professional, logic-directed decoder card—the 150. The sound mixer monitors his mix through this card, adjusting the mix “to taste.” Obviously, the closer a home decoder comes to duplicating the action of the professional card, the more the decoding will sound as the mixer intended it. (On such points are ad campaigns built.)

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DOLBY LEVEL

If you’ve owned SQ, QS, or UHJ decoders, you know that, once the decoder has been set up, you rarely have to change level or balance settings, regardless of the source material.

Would that Dolby MP-encoded movies were so accommodating. Change films, and you may have to readjust the Surround level. In fact, the Surround level often varies within a film! I’ve often looked at the Shure display and seen that something was going on in the Surround track that I couldn’t hear. I’d raise the Surround level, only to find a few minutes later that it was excessive. Then I’d lower it, only to find . . .

These shenanigans are common. Whether they result from a poor initial mix (possible) or a sloppy transfer to home video (more likely) is hard to say. Just keep your remote control handy.

In setting up Dolby MP, always start with the Surround levels too high (you’ll hear the dialog spilling into the Rear). Then lower the levels until you get (what seems to be) a good balance. Further minor adjustments can be made from there. If you set the levels conservatively (too low), you may miss treats on the Surround track.

If you have an oscilloscope lying around, try connecting it to the undecoded Left and Right tracks (Left to X, Right to Y). The resulting Lissajous pattern shows whether the signal is mono or stereo, and about how much activity you can expect from the Surround track. I found a ’scope useful in picking selections to test the decoders.
There are three parameters defining the operation of a logic-directed decoder:

1. The way it monitors the signal to determine the loudest (dominant) sound.

2. The way it derives and applies anti-phase signals to cancel the crosstalk.

3. The attack/decay times and patterns for the cancellation activity.

Dolby Labs has defined these for home decoders, and called the definition—uh—Pro-Logic. Any licensed decoder following them can also claim the status of a Pro-Logic decoder.

Here's where the trouble starts. It's one thing to have the Dolby Surround badge on the front panel. It's another to sport Pro-Logic. The more you take from Dolby Licensing, the more your product looks like others with the same features. Similarity does not sell.

Shure dubbed its logic system "Acra-Vector" and has kept the term, even with the introduction of Dolby Pro-Logic. Besides the obvious desire to create a difference, and maintain some distance from Dolby Licensing, they have other reasons for not adopting Pro-Logic. The main one seems to be intellectual independence. They would rather work through the problem themselves and arrive at their own solution. Shure claims a high level of technical resources and engineering skill, so this independence may be part of their strategy in creating an image for the company.

Pro-Logic's parameters are not necessarily fixed. Their values may change as Dolby Labs finds better ways to apply logic control. No firm likes surprises, especially when they require unscheduled modifications.

To the end of acquiring their own expertise, Shure gathers mass quantities of MP-encoded LaserDiscs, most of the decoders made by other firms, and a Dolby professional decoder. They also keep in touch with Dolby Labs and talk with the engineers who mixed the films, to be certain they know what the intended directional effects were. They feel this puts them in the best position to design a decoder that duplicates the intended directional effects, without being in thrall to Dolby's technology.

The result is Shure's claim that Acra-Vector is just that. Is it? We'll return to this point later on.

Let's get the good news out of the way first. In 1986, I felt the Shure HTS-5000 had the best sound and best surround presentation, by far, of any of the decoders reviewed. Unfortun-ately, we had a very tight deadline, and the Shure arrived at the last minute. So I wasn't completely, er, sure of what I'd heard.

This year I am sure; there's no question about it. The HTS-5200 is sonically far superior to any of the other decoders (save one). The differences aren't even subtle.

Spend a few minutes with any other decoder. Use whatever speakers you like, even modest ones (as I did). Now yank the cables and drop in the Shure.

About three layers of murk, veiling, and grudge are stripped away. The midrange and high end really open up. This major increase in detail and clarity (from Class C to Class A, relatively speaking) does not bring with it any added brightness, harshness, brittleness, or tizziness.

This improvement extends to the Surround channel. Everything going on in the Rear is plainly audible. Subtle details and voices pop out at you. There is a spaciousness to the Surround track matched by no other decoder. The 5200 is the only decoder that passes Surround through a comb filter for added spaciousness. The purpose is to give a broad spread of sound, since one cannot use a dozen Rear speakers the way theaters do. Other companies pooh-pooh the idea, but it makes sense to me.

The overall clarity and spaciousness of the sound are audible on all program material. However, two scenes from Star Trek IV really display the Shure's superiority. In the Federation Council Hall scene, as Sarak enters to rebut the statements of the Klingon ambassador, no other decoder presents the room ambiance in quite so detailed or spectacular a fashion. As Kirk and crew pass through time to return to 20th-century Earth, there are many little snatches of dialog in the background. Only the Shure (and, to a lesser extent, the Sony) allow one to clearly delineate them.

An added benefit of this processing (called Acoustic Space Generation) is that the Rear image is more stable with head motion. When the Surround track is played in-phase through the Rear speakers, it images directly behind one's head, which is sometimes unnerving or even uncomfortable. The image also moves with head motion. When the Surround track is played anti-phase in the Rear speakers, the sound is phasey and has no clear location. However, it tends to jump from side to side as the head is moved.
The 5200's comb filtering places the Surround track consistently behind the listener, with a broad spread. There is little shift with head movement. In this respect, the Shure is much closer to sounding like what one hears in the theater.

But what about Acra-Vector? Is it really superior to other logic-enhancement systems? Frankly, Scarlet, I don't know. Using the HFN/RR test disk, the glug-glug signals showed the crispest Frontal positioning, with the least crosstalk. The difference between the Shure and the other decoders was not great, though.

The difficulty in making a determination is that the other decoders sound more veiled and murky. This lack of definition adds to whatever errors (may) exist in the decoding. As there is no rational way to separate the effects, there is no way to decide which decoder, if any, has the best logic action. The Shure's superb sound quality renders the point moot, anyhow.

The HTS-5200's decoding is not perfect, however. It was the only decoder that allowed any Rear-sibilance spill during Zeus's diatribe. And as all the logic-cum-delay decoders, it had problems with Dialog/Surround directionality.

When there is only a Surround signal, none of the logic decoders has any problem in suppressing its spillage into the decoded Front channels. It's the delay that screws up everything. The delay allows the Frontal crosstalk to arrive before the intended Surround sound, and the ear has no trouble picking it out as a separate source, even though its level is well down.

This shows up not only with test signals, but on soundtracks. In the first scene of The Empire Strikes Back, the probes move from Front to Back, then from Back to Front. When a decoder uses delay, the Frontal crosstalk (from the Back-to-Front motion) reaches the listener before the Surround signal, fouling the ear's ability to hear the "correct" motion.

And that's just what happens. Through the HTS-5200, Front-to-Back movement is vague and unconvincing. It's more like a burst of smeary sound than any real movement. Of course, this is a minor failing, as soundtracks rarely have this type of motion.

The 5200's Stereo mode is principally for ambience extraction, not a full wraparound effect. It did an exceptionally good job with the three test disks, superior to everything but the Sony. Faun and Feather had an excellent sense of space, in an apparently larger room than the Fosgate could create. The Equale Brass disc came closer to sounding like the output of an Ambisonic decoder than any of the other MP decoders could manage. The 5200's ambience extraction was always almost unnoticeable until it was shut off. This is a mark of superior ambience synthesis/extraction.

The 5200's LED display (which shows the relative levels of the five outputs) is also superior. It's big and easily read from across the room. It often alerts you to something going on in the Surround track that you might otherwise miss.

The 5200's remote control has just three adjustments (master volume, surround volume, mute), but it works at a great distance from the decoder and over a wide range of angles. (It should. It has four LEDs spaced over 180°, which Shure says they "drive the hell out of.") The 5200 is the only decoder with motor-driven output-level controls. I can't tell you what a pleasure (and convenience) it is to punch the remote and see the level change.

The HTS-5200 has an electrical liability you should be aware of. Its output impedance is over 5 k, a high value even for vacuum-tube equipment — and the Shure is solid-state. I discovered this when I switched to some cables made from high-capacitance Neumann microphone cable. (The sound was not so much dulled as gorgeously rounded-off.) If you use high-capacitance interconnects (many high-tech cables are), keep their length to no more than 20 feet. I'm hanging on to the Neumann cables for that occasional shrill soundtrack.

The Shure HTS-5200 is, by a wide margin, the best-sounding Dolby MP decoder yet tested. Period. It has a cleanliness, focus, and detail that other logic decoders lack. Its sound and presentation are nothing short of theatrically spectacular. The soundfield it reveals is a vividly colored landscape, brilliantly illuminated by the noonday sun. (The others are, at best, early evening, with the rods taking over from the cones.) If you don't need such things as mono enhancement or full-surround synthesis, the HTS-5200 is unquestionably the Dolby decoder of choice.

Sound Quality:
Sony SDP-505ES
The Sony is an altogether different bird from
the Shure. It is primarily an ambience-extraction system, with Dolby Surround tacked on to guarantee sales. Yet, like the Shure, dropping it into a surround system reveals a cleanliness and clarity you don't get from the other decoders.

What makes this significant is that the Sony's Front channels are passive; there is nothing but a volume control between input and output. This is strong evidence that the Shure and Sony are sonically almost neutral, and the other decoders "in error."

Without logic action, the Sony's Dolby Surround performance is not as exciting as the Shure's. There is some Front-to-Back spillage, both with test signals and unusual music—such as the bells in the Right channel of Clash. There was also the Front/Back channel of Empire, with a more convincing effect from the probes moving toward the listener.

The Surround track is not so clearly differentiated from the Front channels, nor as spacious. On the other hand, its clarity is superior to that of all other decoders' (save the Shure). It is easier to hear what is going on than with any of the logic decoders. This strongly suggests that basic sound quality takes precedence over any amount of sophisticated logic. (Aphex, Fosgate, and Shure would, no doubt, disagree.)

The Sony's ambience extraction—its raison d'être—was superior to that of all other decoders'. (It can doubtless do other interesting things, but JGH pulled a Ralph Hinckley and lost the instruction book.) I set it to Presence mode, with 30ms delay in one Rear channel and 25ms in the other. (This apparent discrepancy serves two functions. It mimics the asymmetry of good-sounding halls, and causes mono components to arrive at different times, creating a comb filter that enhances their perceived spaciousness.)

With all three test recordings, the Sony had the most realistic and seamlessly coherent ambience enhancement. "Delicate" and "airy" are apt adjectives. Bert Whyte (who hates the Yamaha DSP-1, for reasons that I understand but don't agree with) loves the Sony SDP; and it's obvious why. Besides sounding good, the Sony has the obvious advantage of being "100% natural." It extracts ambience from the recording, not a ROM look-up table.

The Sony has other functions which I did not have time to fully experiment with. Perhaps some day I will reclaim the instruction book and do a more thorough review. In the meantime, I have no hesitation in recommending the SDP-505ES to those who want enhanced ambience, but are offended by the idea of synthesized acoustics. That the Sony has an integral 14Wpc amp, costs only $700, and boasts one of the cleanest, most transparent Dolby MP decoders available, is a thick coat of icing on the cake.

**Sound Quality: Sansui DS-77**
The Sansui is the third recommended decoder, not because it's a great product (it isn't), but because it does a lot of things competently, and at a low price.

The Sansui decoder is built around their standard QS matrix chip (of which Sansui appears to have billions and billions). Though it has neither logic nor delay, the DS-77 is a competent Dolby MP decoder.

As with the Sony, there is some spillage of bells from Front to Rear, and some slight sibilance splatter. Surround-to-Center-Front spillage is noticeable, but not severe. The Front-to-Rear motion of the probes in Empire is not convincing—the sound jumps abruptly to the Rear, rather than moving there. The Back-to-Front motion sounds right, though. Although the sense of Front/Back directionality is not as obvious or crisp as with logic-directed decoders, there is never any doubt as to what belongs where. The Sansui's overall presentation is only slightly worse than that of the logic decoders.

The DS-77 has a number of stereo enhancement modes. Set to Hall, it did a fair job of extracting ambience from Feather and Faun, though the sound was not as spacious as from the decoders with delay. Lacking logic and delay, the Surround level setting proved critical for the best ambience extraction and the least Front/Rear leakage.

The Equale Brass recording places some of the instruments to the Rear. Set to QS Surround, the DS-77 did a fairly good job of putting them there. It also did a fair job of producing wraparound effects from conventional stereo.

The Sansui's sound quality is no match for either the Shure's or the Sony's, but frankly, it was judged no worse than any of the full-logic decoders that cost two or three times as much. Its SuperBass Synthesizer is muddy-sounding and thumpy, while the Peak Attacker [sic] is not only audible (in the wrong way), but makes

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the background noise pump! Nobody in their right mind would buy the DS-77 just to get these features, so we can’t very well hold their poor quality as a failing. Besides, the DS-77 has an excellent stereo synthesizer as compensation.

The Sansui DS-77 is a perfectly acceptable surround decoder for a budget or basement system. The built-in amplifier is a nice monetary convenience. The DS-77’s performance may be not be state-of-the-art, but neither is its price.

(The following three decoders are not recommended, unless you vitally need a unique function. The Yamaha DSP-1 is not, strictly speaking, an MP decoder—though it includes that function. Its non-recommendation is only as an MP decoder. As an ambience synthesizer/extractor, it is still recommended.)

**Sound Quality: Aphex ESP-7000**

Aphex is to be congratulated for building a high-performance logic-directed decoder *without* the Dolby-authorized delay or Dolby NR. As we’ve seen, the delay sometimes causes imaging problems. It takes guts to sell a Dolby MP decoder without the “Dolby seal of approval.”

As there is no delay to mask Front/Rear crosstalk, Aphex uses the DSR (Dialog Scatter Reduction) circuit to minimize sibilance splatter. (When turned on, it appears to roll off the high frequencies in the Surround track, though that is probably not all it does.) Oddly, none of the video disks ever needed it, even with the severe spitting in *Clash.*

On the other hand, the Aphex couldn’t keep the bells in *Clash’s* title music out of the Rear channel; the spillage was quite noticeable. There was also some Center-Front to Surround leakage with the glurg-glurg test tones.

The Aphex’s stereo enhance mode seems intended to wrap the sound around the listener, rather than extract ambience. (This is either a liability or an asset, according to one’s tastes.) The results of this processing struck me as neither accurate nor pleasing.

With *Feather,* the performers wrapped around the listener, but with confused and unstable positioning. Sibilance splattered to the Rear, even with DSR on. With the Equale Brass the wraparound was even more confused-sounding, having much the effect of playing a matrix X recording through a matrix Y decoder. *Faun* had more stable positioning, but seemed more artificial-sounding with the processing than it did without. I’ve heard SQ, QS, and UHJ decoders synthesize far better Surround effects, so I was not impressed with the ESP-7000’s performance.

The Aphex’s basic problem is the same as the other decoders’ in this group: The sound is just too murky and muzzy to get a recommendation. There aren’t any features or performance differences to tip the balance the other way.

**Sound Quality: Fosgate 3602**

I wish I could be more enthusiastic about the 3602, as it has some good things going for it. Principal among these is the Wide, or panorama mode. It expands any stereo signal among the Side and Front speakers, for a Cinerama-like spread of sound. Alternatively, if the Side speakers are put to the Rear, the sound wraps around in an arc. (If you’ve never heard pop music played this way, you don’t know what you’re missing!) The 3602 and the Aphex ESP-7000 are the only logic decoders with this function.

Fosgate strongly emphasizes this feature. Some movies (especially those made in the late ’70s and early ’80s) have few or no surround effects, and Wide allows one to be continuously immersed in full Surround.

Wide generally worked well (and much better than the corresponding mode on the Aphex). The effects were especially spectacular on *Star Trek: The Next Generation,* which rarely has surround effects. Here, the continual engine noise was moved around to a more believable position—to the Sides and Rear of the listener. There was some occasional image-jumping from Front to Rear as sound sources altered their positions, but this is to be expected when the “encoding” isn’t keyed to the decoding.

Wide’s only weakness is the lack of a control to vary the effect. (The original Space & Image Composer had one, as do all Ambisonic decoders.) Charles Wood reminded me that this would require an extra set of (expensive) phase-shift networks. True. And it’s unfair to criticize the Fosgate on this point, when none of the other decoders have any kind of good full-Surround synthesis.

Another nice feature is the bass boost. It adds some real sock and punch, even to classical music. The effect is neither thumpy nor muddy.

On test signals, the Fosgate’s logic action is almost as good as the Shure’s, with only mini-

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mal Front-Back spillage. However, as with the other logic-and-delay units, a Surround-only signal is plainly audible in the Front, as well. Similarly, it has trouble with the Empire probes that move from Back to Front.

Its ambience extraction was okay, though somewhat inferior to the Shure’s or Sony’s. With the Normal stage width setting, the sound from Feather and Faun was pleasantly open, but was not as spacious as with the other two decoders. The Equale Brass recording sounded too reverberant, but was otherwise okay.

The problem, again, is one of sound quality. Unfortunately, the Fosgate has the same kind of veiled, muzzy sound that afflicts the other decoders. If the Fosgate sounded as good as the Shure, the two units would be neck-and-neck. One would only need to choose between the greater spaciousness of the Shure’s Surround track and the wider variety of operating modes of the Fosgate. Until the 3602’s sound quality improves, I can give it only a grudging recommendation, for those who are more interested in experimenting with surround effects than they are in basic sound quality.

**Sound Quality: SSI SSI-720**

With test tones, the SSI showed some slight Front-to-Rear leakage and a more serious Rear-to-Center-Front spill. This is a problem with most of these decoders. Its performance, though, is somewhat better than the Aphex’s.

The probes at the beginning of Empire were convincing in both their Front-to-Back and Back-to-Front movement. This performance was unique among logic-and-delay decoders. On program material, the 720 displays a noticeable Front-to-Back narrowing. There is no question as to what is where, but the apparent acoustic distance from Front to Rear is distinctly reduced, as if the two sets of speakers have been moved closer together.

As with the Aphex, the SSI’s stereo enhancement leans toward full-Surround effects, rather than ambience extraction. The effects on all three test recordings are similar to the Aphex’s, except the images were more stable and less confused. The Equale Brass recording produces interesting directional effects.

I hope this doesn’t sound petty, but the SSI’s remote control was the only one that came with a cheap carbon-zinc battery. (All the others used heavy-duty or alkaline cells.) The battery failed early on in the testing. Again, the SSI fails a recommendation due to its mediocre sound quality, lack of offsetting features, and decoding performance.

**Sound Quality: Yamaha DSP-1**

The Yamaha’s ambience synthesis was discussed fully in Vol.10 No.4. There is no need (or space!) to repeat it, except to say that the DSP-1 is the best consumer device of its type yet to appear. Its Dolby MP decoding is another matter.

On test tones, there is some Front/Back spillage, but it’s no worse than with some of the logic-directed decoders. On program material, however, there is no strong sense of Front/Back directionality, or expansive spatiality. Everything is where it belongs, but there is no snap or focus to the effects.

Surround effects are acceptable when the Surround track is not too “busy.” As sounds start piling up, however, the Rear channel becomes muzzy and “confused.” Combine this with the veiled, less-than-clean sound that most of these decoders suffer from, and you have the worst-sounding MP decoder of this group. This is most unfortunate, as many listeners would appreciate not having to buy separate ambience-synthesis and surround processors.

**Conclusions**

The three top products either have clearly superior sound quality, or cost a lot less than the competition. They are so different from each other that you should have no trouble choosing the right one for your needs.

In my discussion of testing procedures, I noted that none of the logic-directed decoders performed as well as it ought (given a Tate SQ decoder as reference). The “correct” solution would be to build Ambisonic decoders that don’t depend on logic action or delay, but this isn’t likely in the near future.

As an alternative, I would suggest that Aphex, Fosgate, and Shure redesign their decoders’ logic action to get the best possible results *without the use of delay*. The delay could then be switchable, to be used only when a bad recording keeps the logic from working at full effectiveness, or with a large group of listeners. Both QS VariMatrix and Tate System SQ decoders show that such a thing is possible.

A practical note: Two of the decoders either had faults as received, or failed in some way during testing. One manufacturer has told me
of his difficulty in getting properly soldered boards. These things are hardly surprising, since surround decoders are among the most complex consumer audio products.

Therefore . . . do not assume your shiny new decoder is necessarily working perfectly. When you get it home, check all the operating modes carefully. You don't want to discover that some obscure function isn't working a week after the warranty expires.

Manufacturers' Addresses:

Aphex Systems Ltd., 13340 Saticoy St., North Hollywood, CA 91605. Tel: (818) 765-2212.

Fosgate, Inc., P.O. Box 70, Heber City, UT 84032. Tel: (801) 654-4046.

Sansui Electronic Corp., 1250 Valley Brook Ave., Lyndhurst, NJ 07071. Tel: (201) 460-9710.

Shure HTS, 222 Hartrey Ave., Evanston, IL 60202-3696. Tel: (312) 866-2608.

Sony Consumer Products, 1 Sony Dr., Park Ridge, NJ 07656. Tel: (201) 930-1000.

SSI Products, Inc., 400 S. Date Ave., Alhambra, CA 91803. Tel: (818) 282-9419.

Yamaha Electronics Corp. USA, 6660 Orange-thorpe Ave., Buena Park, CA 90620. Tel: (714) 522-9105.

**FOLLOW UP**

**Krell KRS2 preamplifier**

OK, I own up, I've been using my Audio Research SP10 Mk.II preamplifier for four years now, and until recently, nothing I have heard from other preamplifiers, even the much-vaulted SP11, has persuaded me to change. Yes, the line stage is not as neutral as that of more recent contenders, but for LP replay, it gave me the combination of detail and, for want of a better word, "musicality," that I desire.

Until recently, I lent it to LA, who found himself temporarily sans RIAA preamp, for the Stereophile Christmas party: "Aaah!" he screamed, "The woofer cones of my Thiel CS3.5s are pumping in and out!" He was right, the cones were going back and forth pretty much across their peak-to-peak excursion at about 0.5-1Hz.

Not a good thing to happen. I am told that this subsonic instability is due to the ECC81 tube in the power supply going bad—an op-amp error amplifier drives a power series-pass tube for the regulated HT line via the ECC81. OK, it helps to have a reason for the problem, but I was ostensibly preamplifier-less.

Enter the Krell $4500 KRS2, a two-chassis, dual-mono, solid-state preamplifier with a separate transformer module reviewed for Stereophile by Anthony H. Cordesman last June (Vol.10 No.4). Not to beat around the bush, AHC was pretty impressed by this fruit from Dan D'Agostino's breadboard, finding it "reveals a new degree of neutrality and transparency." Praise indeed from the aristocratic Mr. C.

Krell had lent Stereophile a KRS2 for our seminars at last October's New York Show; I set it up in my regular system—two Linn turntables, one fitted with a Trollka/Ittok combination, the other with a Koetsu/SME V, and a Krell KSA-50 power amplifier—and used it for my regular diet of equipment for review.

Two months later I only have one observation to add to the original review. Yes, the KRS2 is everything that it was said to be: a truly transparent Class A sound, with a line stage wired by a straight wire with gain. But in addition, the KRS2 shares an aspect of the SP10 in that it, too, communicates the essence of the music. Your foot taps. Each record seems to lead inexorably to another; even mono Tom Lehrer recordings sounded "alive." But there is something I find more important: If conventional, excellent electronics present a soundstage wherein the individual images are one-dimensional, like stage flats, individual images within the KRS2's reproduced soundstage had a "roundness," much as they do in real life. It is for this reason that I feel the KRS2 represents a milestone in preamplifier design. It combines the truly analytical, neutral behavior of the best solid-state designs with the inherently musical performance of the classic tube preamplifiers.

—JA
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Richard Schram
President

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Stereophile, March 1988
Although Hector Berlioz is primarily a vocal composer (10 of his 12 major works employ voices), the purely orchestral Fantastica Symphony is his most widely known composition. Apart from a few overtures or excerpts from the Damnation of Faust, it is certainly the most likely work to appear on the shelves of audiophiles. One reason for this is its purely sonic appeal: there must be few hi-fi enthusiasts who haven't at some time used the "March to the Scaffold" or the "Dream of a Witches Sabbath" to show off their equipment. In this regard, it is significant that the technically superb 45rpm LP version of the work issued by Reference Recordings in 1982 (RR-11, Utah SO under Kojian) included a duplication of these final two movements on a fourth side, as a precaution lest they be too rapidly worn out!

However, the collector is faced not only with variations in demo potential, but with a multitude of performing interpretations. There are 64 versions on my own shelves, stretching right back to the early 1950s, while there have seldom been less than a dozen in the catalogs during the last 15 years. So there is obviously need for guidance. But of all the symphonies in the 19th-century repertoire, this is the most susceptible to manipulation of tempo, dynamics, and shading without losing its central identity. Accordingly, it is subject to such a diversity of interpretations that no one performance can be seen as ideal.

The Fantastic Symphony is, after all, the epitome of unbridled Romanticism. It is an extraordinary amalgam of ideas and influences, a Gothic melting-pot of feelings and images such as had never previously been presented in a non-operatic work. Indeed, Berlioz felt impelled to provide program notes for distribution at early performances, saying that they should be regarded as "the spoken text of an opera." These notes introduce each of the work's five movements, which depict various "episodes in the life of an artist."

The merest outline of these episodes shows why performers are easily tempted to impose a personal emphasis, since they are nothing if not a trigger to the imagination. There are reveries of aimless youthful languor, frenzied outbursts of passion for an ideal woman, a
whirling dance, an arcadian idyll with stormy undertones, an opium-induced nightmare of death-march and execution, a wild orgy which parodies the Latin Mass. At the same time, the revolutionary young Romantic conformed to a symphonic pattern which he saw as a natural sequel to the dramatic manner pioneered by Beethoven, a composer whom he worshipped and who died only three years before Berlioz commenced work on his programmatic symphony. Yet the work’s framework is held together not so much by classical thematic argument as by a recurrent romantic motif, a theme representing the artist’s elusive but crucial loved-one. This idee fixe runs through the symphony like a polished skewer piercing a multi-layered musical kebab, glinting meaningfully between a succession of succulent fantasies, themselves illuminated by the flame of an orchestration whose very brilliance invites further titivation.

All this prompts as many and as varied performing reactions as there are conductors willing to wield a baton, and while purists may point to the score and shake their heads at departures from the composer’s intentions (which I confess to doing from time to time), there’s no escaping the fact that in practice we accept greater variations in performances of Berlioz’s Op.14 than would be tolerated with practically any other symphony. How, then, if the yardstick continually changes, does one choose a personal version—or perhaps two or three? Well, at the time of writing there are 20 performances of the work available on Compact Disc, and I will draw on these for examples of differing approaches to various aspects of the score, and then offer a short list of recommendations. Incidentally, it has to be said that the Fantastic Symphony’s exceptional dynamic range really does demand CD silence. When those brassy percussive climaxes are set for a proper concert-hall impact, pianissimos and pauses can all too easily succumb to LP rustles or clicks.

Paradoxically, one seldom actually hears the more extreme pianissimos played as the score indicates. It is quite common for passages marked ppp to be played at p, possibly by habit formed in response to traditional studio constraints. Thus it is especially refreshing to listen to Claudio Abbado’s 1984 digital recording with the Chicago SO (DG 410 895-2), where the dynamic markings are scrupulously observed in a performance notable throughout for its fastidious devotion to detail without sacrificing a convincing overview. A good example of pianissimo effects occurs at that point in the first movement (“Reveries & Passions”) where the horns make dreamy, mysterious calls over muted arpeggios from the violins (bars 50-57). Here, the CSO’s fiddles are so hushed as to be barely audible within the receding spaces of Orchestra Hall. But the score is duly marked ppp, so this departure from the performing norm is actually a return to what Berlioz wrote.

Daniel Barenboim likewise coaxes considerable dynamic subtleties from his orchestra: the Berlin PO on a 1985 CBS recording (MK 39859). Here I would cite the extremely gentle violin/ viola pizzicati running beneath the clarinet about 0:40 after the stormy central climax in “Country Scene” (iii). These pluckings are marked ppp/pbppp (bars 117-125), but are rarely heard that way. Barenboim’s spacious recording, made in Berlin’s Jesus Christus Kirche and possibly a little too deeply immersed in the acoustic for some tastes, also offers particularly effective offstage distancing for the oboe’s responses to the English horn at the opening of (iii), a feature sometimes handled rather insensitively. The drums also receive continual close attention from Barenboim. Listen especially to the start of the “March to the Scaffold” (iv), where the close-spaced timpani eightnotes which set the beat are clearly articulated instead of merging into the usual homogeneous thuds.

The timpani also have an important role near the end of (iii), where they provide a series of ominous rumbles, “the sound of distant thunder” (bars 175-190), in answer to the English horn’s plaintive calls which have now lost their echoing oboe and thus symbolize lonely isolation. Colin Davis’s classic 1974 analog Concertgebouw recording (Philips 411 425-2) perhaps represents the optimum here, but the drums do sometimes get a little out of hand in other versions. For an extreme departure (temporarily abandoning CD), anyone with access to Pye’s 1964 Barbirolli/Halle recording should try setting its English-horn loudness to match that of the Davis—or most other versions—and then let the drums roll. The Halle timpanist seems more intent on producing an impression of nearby gunfire than of distant thunder.
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Another percussive departure occurs in Lorin Maazel's 1982 Cleveland recording for Telarc (CD-80076). As Berlioz's famous parody of the Dies irae moves back and forth between tubas/bassoons and trombones/horns in the "Witches Sabbath" (v), the bass drum enters with a series of 20 beats (bars 187-206). These are marked with a modest mezzo-forte, but Maazel dictates a series of mighty fortissimo thwacks to add to the dramatic impact of this Severence Hall recording. Was he persuaded by the Telarc team to make full use of their no-compromise recording back-up in order to impress audiophiles? Anyway, to regain some less heady sonic bearings, try Charles Dutoit's Montreal version (Decca: 414 203-2) for a truly mf bass-drum, and then Janos Ferencsk's "live" Hungarian SO recording (Hungaroton HCD 12713-2) for a practically inaudible one.

If by now you are fascinated at the opposing reactions to a common score, do also endeavor to hear what Leonard Bernstein and Georg Solti make of their respective tintinnabular contributions to that same last movement. In Bernstein's ebullient but unsubtle 1977 Paris performance with the French National Orchestra (EMI CDM 769 0022), the bells are given such a close-up balance (despite being marked "behind the scene") that the first two of each set of three chimes peak on my level-meter to the same point as full orchestral fortissimos. I would say more like fff than the score's f. On the other hand, in Solti's assertively brilliant but nevertheless curiously uninvolving 1972 Chicago version for Decca (supplemented on 417 705-2 by an exciting if rather overdriven Franc-Juges overture), the three chimes sound so faint and distant that they have practically no impact at all. They represent the death-knell of the executed artist, as a prelude to and then intermingled with the noisy Dies irae, but seem here more like a symbol of lost innocence. Yet who is to say exactly what fortissimo means in terms of loudness if the instrument in question is supposed to be offstage?

There is another aspect of these chimes which poses a different set of performing and recording problems: they are scored at pitches which cannot be supplied by the usual orchestral tubular bells—which were in any case not introduced until after Berlioz's death. The three-note motif uses two middle-Cs and the G below, whereas the standard bells only go down to middle-C. It is therefore common practice to play the phrase an octave high, with consequent loss of solemnity. Recording producers are now making increasing efforts to get this right, but even so, only five of the 20 CD versions are correct: Abbado, Barenboim, Davis, Karajan, and Muti. Mention of Muti reminds me that the search for these lower pitches sometimes conjures up some slightly odd-sounding chimes. Thus a first play-through of Riccardo Muti's 1985 Philadelphia recording (EMI CDC 747 2782) could make one wonder whether the EMI team was forced to scour the local hotels for a suitable pair of dinner-gongs.

Then there is a further campanological complication, for in addition to the above pitch problem the score specifies that the three notes be underpinned by their two sub-octaves, which simply cannot be done with bells unless one prerecords in a church and then dubs in the chimes. This is what happened in Herbert von Karajan's second Berlin recording (DG 415 325-2), which is mightily effective in its sense of doom and gloom despite the fact that one can hear the recorded background coming and going with the bells. Berlioz indicated that "several pianos" could be used if necessary, and this expedient, plus various types of deep gong, and even supporting lower tones from brass instruments, may be found if one hunts around. But apart from Karajan, on the CD versions only Abbado makes any attempt at a proper sub-octave fill-in, with a strikingly
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Sterophile, March 1988
ominous and swimmy effect which I'm told was achieved by hitting the strings of a piano with a hammer. Interestingly, Barenboim seems to use a wind instrument to fill out the tone of his main (upper) bell pitches, and while the Maazel/Telarc recording used outside church bells, it somehow still failed to get the dominant pitches into the right octave.

Another difficulty with the score in (v) is that Berlioz specifies ophicleides where it is now usual to employ tubas. The composer was actually perpetrating a local joke here, for Paris audiences in the 1830s were familiar with the use of wooden serpents (a keyed instrument of which the ophicleide was a sophisticated brass version) to accompany choirs singing very slow equal notes—in alternation with the organ—in the performance of plainsong. He was poking fun at this very practice, and used ophicleides and bassoons to intone the Dies irae theme in imitation of the notoriously horrid noises heard in the churches. But despite the bassoons' underpinning, the sound we now hear is less coarse-grained than intended because of the tuba's more rounded and dominant timbre.

Conductors vary in their response to this. The nearest approach to an ophicleidic effect (perhaps they are ophicleides) is in Bernstein's Paris recording, although Solti's Chicago manner in attacking the Dies irae does at least suggest a touch of defiant cockiness, if not the intended tone color. On the other hand, at the furthest remove from what Berlioz himself called the serpent's "frigid and abominable blaring," Dutoit's tubas offer a lugubriously smooth tone, this being one example of a suave approach which lacks that touch of fiery Berliozian poise needed to match Decca's superb recorded Montreal sound.

Next on my list of variations come the harps used in 'A Ball' (ii). As with the bells and English horn, this is the instrument's first-ever appearance in a symphony, and to avoid doing things by halves Berlioz has scored two harp parts, each designated as needing at least two instruments, so the minimum requirement is four. These are rarely if ever seen on the concert platform and surely never found in a recording, where the required balance is easily achieved by other means. In fact, the harp balance varies enormously on CD, from well back within the Lille Philharmonic Orchestra on Jean-Claude Casadesus's lovely 1981 recording for Harmonia Mundi (HMC 90072 and presumably an analog original), to right up front in Zubin Mehta's brilliant NYPO performance for Decca (400 046-2). The latter was the first-ever digital recording of the symphony, made in Avery Fisher Hall in 1979. One London critic remarked that the balance adopted almost made (ii) into a harp concerto, but one should remember the composer's extravagant wishes here.

The existence of two harp parts in the score suggests the possibility of some spatial separation, which can be heard in moderation on a few recordings, but is actually used to deliberate antiphonal effect in Maazel's 1980 Cleveland production for CBS (CD 76652). The two harp parts here are arranged fairly obviously to left and right, with an interesting if not vitally important "conversation" between alternating arpeggios.

This same recording joins Maazel's Telarc version and those by Abbado, Davis, and Mehta in using the cornet part added to (ii) by Berlioz in 1844. The instrument brings an extra touch of brilliance as it pops up here and there during the waltz, and makes a very obvious difference right at the movement's end—especially in Maazel's CBS recording, where it is set in a sort of counterpoint against the normally more subdued horn part.

Finally, there is the matter of optional repeats in (i) and (iv), which is straightforward, and of tempos and timings, which could easily absorb a whole separate article. The repeat in (i) brings some satisfying extra weight to the movement, and occurs in nine of the CD versions. My final six recommendations will all include it, but only Abbado, Davis, and Muti bother with the repeat in (iv), which is more difficult to bring off—particularly if considered programatically, as the condemned man is sent right back to the start of his death-march for another two minutes of suspense.

If one brings all versions to par by subtracting the repeats, timings for the whole symphony extend from Mehta's vigorous 47:21 up to Ferencsik's rather wearisome 54:00. That's a difference of 14%, which is subjectively quite considerable, but if one looks at the separate movements there are even bigger variations. In (ii), for instance, Bernstein takes a good minute more to get through his waltz than does the quick-fire Carlos Paita in a rather eccentric LSO recording on Lodia (LO-CD 777), while
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in (iv), Casadesus needs nearly 90 seconds more than Maazel for his condemned artist to reach the scaffold, a difference of 34% which seems more like 100% when judged by ear.

The conductor offering the most extreme tempo variations within one performance is Hermann Scherchen, whose 1954 mono LSO recording has now been transferred to CD (PRT PVCD 8395). It is worth putting up with the technical flaws of these long-stored tapes in order to be amazed and amused by Scherchen's rhythmic eccentricities. His opening 16-bar Largo must be the most drearily slow on record (he actually takes longer than Karajan, a past master at portentous lumberings), whereas at a mere 3:47 his death march is more like a cheerful trot, making a nice comparison with Casadesus's funeral cortege extreme of 5:27.

Well, I have mentioned all but five of the CD versions (Pretre/VSO, Munch/Paris O, Conlon/French Nat. O, Batiz/RPO, and Fournet/Tokyo Met, which all have their own oddities to offer) without even a whisper concerning those little touches of added color arising from sliding woodwind notes, exaggerated retinuti, odd raspberries on the brass, etc. But the reader must by now be impatient for some firm advice.

Anyone wanting completeness should turn to Abbado. He offers repeats in (i) and (iv), a cornet in (ii), and correctly pitched, octavely underpinned bells in (v), with great attention to practically every detail of the score, a fine overall pulse, and a spacious Chicago sound which gives cause for reservations only in that the recording allows upper strings and woodwind to recede somewhat during quiet episodes. Davis likewise provides all the extras (except bell underpinning), and while his pianissimi are not so adventuresome, his compelling feel for the Berlioz idiom shines through at every point. The airy Concertgebouw sound is predictably fine, and this is the performance that I tend to return to as a reference, a sort of well-architected "classical" view of this most romantic of symphonies, a view which never tires despite its relative lack of daring.

One can certainly find touches of daring in Muti's version. He omits the cornet from (ii), but his performance does include some striking surges of tempo and phrasing, and has a general liveliness which is rather appealing. For instance, sly little string portamenti in (ii), and an acceleration each time the brass declaims the March's second theme in (iv), leading to quite a flurried chase around the guillotine just before the idee fixe intervenes. Finely contrived EMI digital sound here, taped in the Fairmount Park Memorial Hall's seemingly somewhat neutral acoustic, and interesting to set against a more simply miked digital recording made by another British team (for CBS) in Berlin: the reverberant Barenboim version. Timings for the latter are on the slow side, but Barenboim holds everything together within a beautifully judged ebb and flow, which I differ from some fellow critics in admiring. One must be in a relaxed mood for listening to this performance, but it can work wonders.

Lastly, a really contrasted pair: Casadesus and Mehta. The Frenchman's view of the symphony has a contemplative rather than dramatic bias, with a delicate sense of mystery in (i) and (iii) and some superb playing from the Lille orchestra's string departments—tend to outshine the winds in the recorded balance. Yet the great climaxes are all there and the uncontrived recording has impressive dynamics within the receding depths of Lille's l'Hospice Comtesse. Like the Barenboim, this is a dreamily laid-back version of Berlioz's romantic drama. Discounting repeats, it has the third longest overall timing on CD—but do try to hear it, if only to be impressed by the contrast with Mehta's brightly lit New York version. This latter has a much more analytical recording which searches out every instrumental detail, including separated timpani eightnotes at the start of (iv) that match the clarity of Barenboim's drums despite a much faster pace. More importantly, it has a tremendous overall rhythmic drive which ought to be experienced by anyone wishing to hear Berlioz's inexhaustible score in every possible guise.

Don't end up with just one version of the Fantastic Symphony: the variations are too good to miss.

Postscript: A 21st CD version has now arrived (IMP PCD 870), featuring the LSO under Richard Williams. This combines a spacious but well-balanced church recording with some extremely leisurely pacing—including both repeats. Although Williams takes longer than anyone else at nearly 58m, he nevertheless makes one forget the passing of time with much beautiful detail and a fine use of rubato. EMI has also announced another CD: Beecham's famous French recording of 1961 (CDC 747 8632).
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The new Schwann lists 40 Beethoven 9s, not counting this one. We live in a time when comprehensive analyses of performances of the Beethoven symphonies can go on at considerable length just by comparing a single conductor's various readings. Solti himself has said that every Beethoven conductor should record the entire cycle three times (his own first "cycle" consisted of 3, 5, and 7, with the VPO; the second, complete, with the CSO; this is the first installment of his third). As most of those many 9s are well worth hearing, for one reason or another, I can't hope to single one out for recommendation—that would probably be beyond even Christopher Breunig's encyclopaedic knowledge. This review, then, will for the most part compare the new recording with Solti's 1972 CSO transcription.

The late London/Decca producer John Culshaw once said of Georg Solti's conducting that Solti is "literally capable of driving himself and his forces to a point where the climax or resolution of a piece has been so intensely anticipated that it does not occur." This will surprise no one familiar with Solti's first Beethoven cycle, in which his obviously well-informed interpretations and rhythmic precision became, as often as not, dogmatic, humorless, and stiff. This was cause for no little bewilderment at the time: how could someone who conducted Mahler and Wagner with such irresistible passion and drive, with such unerring dramatic instincts, deliver such stodgy Beethoven? If we expected anything, it was an inappropriately florid romanticism; was Solti then overcompensating, trying to live down his reputation as the Great Wagnerian Whiz-Bang? The Flying Dutchman, his last—but-one Wagner recording and the first with the CSO instead of the VPO, came out sounding much like the Beethoven: thick, turgid, morose, the CSO's impeccable playing notwithstanding. Was it the CSO itself? Hard to believe. Many listeners simply put it down to hardening of the musical arteries and directed their attentions elsewhere.

Those listeners would be well advised to turn their ears back in Solti's direction. He has returned to conduct the VPO in Lobengrin, the only major Wagner opera he had not recorded (see review below), and this new Beethoven Ninth, though similar in length and scope to the 1972 recording, reveals a warmer, more relaxed Solti than Beethoven's music has heard before.

But the scale is still more geological than human. The first movement opens with spine-tingling menace, quickly building to awesome, mountainous heights. In the first few bars, we learn that this reading will be one of the Ninth as cosmic fact, rather than as one man's musical epiphany. The opening crescendo is a veritable avalanche of sound, and the orchestra is of large, late-19th-Century proportions, which certainly helps the impression. It's also clear in these first bars that the digital recording will allow the performance much more bass than the 1972 recording with the same orchestra, and Solti takes full advantage of CD's great dynamic range (more LP/CD comparison below). JA prefers the opening descending fifths to be far more biting, staccato, and savage, but they're no less foreboding or inevitable in Solti's more legato reading.

There is some lethargic sloppiness in the staccato wind passages of the second movement. Often, the large scale and Solti's slow tempos make the CSO sound as if it is lumbering—there is not a great deal of airy grace here—and fosters an impression of the con-
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ductor restraining the orchestra's falling momentum by main force. On the whole, however, this works to the performance's advantage: we are treated to the miracle of the music's immovable weight being kept aloft by the conductor's irresistible force. The tension is palpable, and I'm happy to say that those "intensely anticipated climaxes" do occur. And, for the record, this movement is more than two minutes shorter than Solti's 1972 version, as is the entire symphony.

A similar dynamic is at work in the Adagio, but to quite different effect. Solti's chosen tempo here is the slowest I've heard (though only 0:14 longer than his previous reading), having more in common with Bruckner than Beethoven, but this is not a problem. Again, the tension—between the actual speed and what sounds like the much faster pace Solti's other side might take if not kept in check—is considerable, but here coexists with a serenity no less serene for its ephemeralness. The movement is almost static, uninflected with needless romance or drama. The near-stationary wind choirs at measure 83 are the most spiritual readings I've heard of this passage, as Solti "stops time" to let the sonorities sing.

The choral finale is much the same as Solti's 1972 recording, except for the singing. Hans Sotin is a vast improvement here over Martti Talvela, turning in one of the strongest, warmest, most appealing jobs I've heard on the opening solo. Jessye Norman is expectedly wonderful, again far outstripping Pilar Lorengar, her '72 predecessor. Tenor Robert Schunk, however, arbitrarily alternates swooping legato and sharp staccato phrasings to confusing and pointless effect in a solo that has no center. With contralto Reinhold Runkel, however, all work together quite well in the ensemble passages, and Margaret Hillis's choral direction is crisp, disciplined, dark, and full, in the Bayreuth tradition of Wilhelm Pitz.

Throughout this movement, Solti's time is so strict as to make Szell and Bohm seem gushing romantics, even though the latter alternatives are shorter, with Szell coming in at 66:08 to Solti's 74:47; I would have preferred a slightly freer hand in a more openhearted performance, with more rhythmic liberties taken with some of the larger choral climaxes. But all in all, this scribbling quibbler loved it; the performance is topnotch, the interpretation uncompromised and visionary, and the sound—on the CD, at least—quite good.

The LP is another matter, however. London chose to release this 75-minute recording on a single LP; side 2 is 45 minutes long. The result is not surprising: no bass, attenuated highs, and, once you turn the volume up enough to get decent orchestral sound, the soloists just about tear your head off. At the end of the last movement, the orchestra is just barely audible under the chorus. Such long sides are also much more vulnerable to surface noise: a ⅛" scratch on a 45-minute side lasts twice as long as on a 22-minute side! It's clear that PolyGram would just as soon we not bother buying the LP at all, and is making it as easy as possible to prefer the CD. Definitely a squeeze play, in more ways than one. This performance deserves better.

—Richard Lehnert

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BERLIOZ

_The Damnation of Faust_

Soloists: Sir Colin Davis, London Symphony Chorus and Orchestra

Philips 416 395 -2 (2 CDs). ADD. TT: 130:35

_Requiem; Funeral and Triumphal Symphony_

Ronald Dowd, tenor; Sir Colin Davis, London Symphony Chorus and Orchestra; John Alldis Choir; Wandsworth School Boys' Choir

Philips 416 283-2 (2 CDs). ADD. TT: 126:39

_The Trojans_

Soloists: Sir Colin Davis, Orchestra and Chorus, Royal Opera House, Covent Garden

Philips 416 432-2 (4 CDs). ADD. TT: 239:56

When the history of the LP is written, one of the landmarks requiring special praise will be the Berlioz cycle recorded in the late '60s and early '70s by Sir Colin Davis, an achievement that is enough to guarantee the conductor's place as a major influential performer who helped shape the taste of an entire generation. Today, Berlioz, in good measure owing to Davis's efforts, is no longer regarded as an eccentric whose output was ostensibly marred by a fascination for the grandiose and the bizarre. Indeed, one of the major (among many) virtues of Davis's recordings is the way in which they reveal how the composer's art is governed by economy and taste and is enriched by a starkly original harmonic vocabulary and a marked gift for melody, but melody that—as Berlioz's biographer, Jacques Barzun, so aptly put it—"refuses to bend around corners."

The good news for record collectors is that all of the Davis/Philips Berlioz is to be reissued in a series that will ultimately total 23 CDs. The three items submitted for review are among the prizes of that series, each marked by the
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special insight that has stamped Davis as the supreme Berlioz interpreter of our time. And the prize among these prizes is surely The Trojans. It was the first, and remains the only, complete recording of the opera, and Davis's efforts on the work's behalf (both in the studio and in the opera house) have helped to make clear that, for all its length and unusual production requirements, it is no more difficult to stage or to absorb than Wagner's Meister-singer: Everything about the recording is riveting: its superb sense of pace, its clarity of detail, and its revelation that Berlioz, if a quintessential romanticist, was nonetheless a romanticist in complete control of his artistic forces.

Similarly, the two other recordings are marked by a balance, proportion, and—yes—a delicacy that prove totally arresting. Listen, for example, to the long-familiar Rakoczy March from The Damnation of Faust, rendered by Davis not as a piece of virtuosos orchestral bombast, but as a broadly sustained, integral part of a dramatic whole. Note the haunting Sanctus from the Requiem and become aware of how Berlioz, despite the massive forces he employed in the score, could also create music of touching intimacy. Even the admittedly weak Funeral and Triumphant Symphony becomes, under Davis's direction, a work free of the crude explosiveness it often acquires in the hands of lesser conductors.

The big question, of course, is of how these CDs compare with their LP antecedents. The answer is, very well indeed. A modicum of hiss remains from the original master tapes, but is far less prominent than the assorted noises produced from the surfaces of the original releases; except in the quietest passages, it is masked by the music. And the naturalness of timbre typical of Philips recordings in general remains unaltered in these laser transfers. Given the CD's greater playing time and its im-perviousness to pops, ticks, and other extraneous clutter, these reissues are surely the preferred format for Davis's magnificent readings. Collectors who own the LP editions should seriously consider replacing them. Those who as yet have somehow avoided acquiring them should rush to rectify the omission. Glorious recordings such as these appear, alas, all too infrequently.

—Mortimer H. Frank

BERLIOZ: Requiem; Symphonie fantastique
Leopold Simoneau, tenor; New England Conservatory Chorus; Charles Munch, Boston Symphony Orchestra


To begin with the conclusion: the music is superb, the performance excellent to outstanding, and the original recording and digital remastering (which RCA has tried hard not to bungle) are very good. This recording was made in April 1959, without noise reduction. For the remastering much of the hiss from the master tapes was deliberately not removed, to preserve as much as possible of the high-frequency content. The result is perfectly acceptable.

With Verdi's, Berlioz's Requiem is one of the two greatest of the 19th and perhaps also the 20th century, incorporating as it does pre-echoes of composers up to Elgar and Sibelius. We hear not the bombast some might expect, but many grand, noble gestures achieved with great economy of means, and many more quiet, reflective moments of great beauty, exquisitely framing the content of the text. This requiem is emotionally sincere, and, like true religion, astounding. Rarely are we musically transported with such intensity and such ethereal delicacy. And rarely has the recording engineer had such an impossible challenge, in the face of Berlioz's spatial effects for a large cathedral-like acoustic space. For instance, there are four brass choirs, arrayed at the four corners; they are employed to grand effect in the Tuba mirum section.

For music scholars, the Symphonie fantastique is important because it is the first piece of music to exemplify completely the new notion of Romantic genius. For me, it is fascinating because it clearly reveals Berlioz the paradox, at once the most musical of French 19th-Century composers (because of his musical genius, his legendary mastery of the orchestra, his staggering influence on succeeding generations) and the most literary (because he wrote more than he composed, because his inspiration was more literary than musical, and above all because he aspired to translate into music the emotional ups and downs of the Romantic artist). Others will simply enjoy one of the most stirring and beautiful symphonies written. It is well known that at the premiere of 1830, most of the audience could not understand the piece; many, though doubting that it was really music they were hearing, still found it beautiful. This is a great tribute to the power of this composition, and we shouldn't let our
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familiarity with it—directly, or indirectly through all the later music influenced by Berlioz—obscure our reactions. We can’t hear the piece with complete freshness, like the first audiences, but we can listen to the next best thing: Berlioz by Charles Munch leading the virtuosos of his Boston Symphony Orchestra.

We can hear in his conducting the best of the French and German schools, the elegance and technical accuracy of the sophisticated Parisians, and the spontaneous inspiration of his German cousins. Even more importantly, he was a conductor who could control an orchestra without appearing to do so, making it speak with the same unfailing artistic taste that underlay his conception of each piece he conducted. Expressive effects don’t call attention to themselves as such (and are all the more expressive for it), and climaxes aren’t highlighted by impure tone or intonation, to give just two examples. Munch and his orchestra give us good athletics and good taste, a rare combination nowadays. This is the kind of music-making we will regard in 20 years’ time the same way we now do the classic Furtwangler and Toscanini performances of the ’20s and ’30s.

—L. Hunter Kevil

BRUCKNER: Symphonies 5 & 6*
Gunter Wand, Cologne Radio Symphony Orchestra
EMI Deutsche Harmonia Mundi CDC 74’ ”462 (CD), CDC 74’ ”472 (CD), Otto Nielsen, eng.; Dr. Hermann Lang, prod. ADD. TT: ”4:38, 53:26

My look at the Wand/CRSO’s Bruckner Symphony cycle continues this month with Nos.5 and 6. Both are given in their original versions, but little of the essential and interesting information regarding their composition is given in the insert notes. The opening of 5 is disparate in the range of material it uses, and sounds so in performance here. Wand failing to weave the various strands together into a satisfying whole. The Scherzo is equally unsettling, with the steely tone of the strings adding nothing to the enjoyment of this reading. The steady, impassive tread of the triplet crotchetts that open the sebr langsam Adagio herald a more tightly controlled, yet sensitively conceived movement, but this makes the scrappy coordination in the Finale all the more unacceptable. When the wonderful, mysterious atmosphere of its opening—an echo from that of the first movement—has been so finely created, failure to sustain the mood is particularly disappointing. The recording has not served the work well either. As in earlier installments of the cycle, there is excellent spread and depth to the soundstage, but climax after climax at double and triple forte suffer HF restriction, and inner textures are swallowed up by the blanketing effect.

Symphony 6 suffers too. Textures are meshed and blended, the thin, underpowered string tone is poorly balanced against the lusty woodwind and brass, the second movement is devalued by sudden ambient loss at its close, while the Scherzo echoes on in endless reverberation despite its final staccatissimo crotchett, smudging the soft pizzicato strings that open the Trio. With more examples of poor coordination, particularly in the sections of cross-accentuation in the Finale, there is little in this performance to excite me. Unhappily, then, I can recommend neither of these performances.

—Barbara Jahn

CHOPIN: Nocturnes
Vlado Perlemuter, piano
Nimbus NIM 5012 (CD). DDD. TT: 50:07

If the Etudes were Chopin’s gift to the pianists of the world, then the Nocturnes are his gift to the listener. These musical microcosms are the French pastry of piano; frequently played at recital (often as encores), the Chopin Nocturnes occupy a unique place in the repertoire. A Classical music collection without them is incomplete. The “night music” of the Nocturnes leads the listener through dark corridors of mystery, pathos, love, melancholy, and even violence. It is Vlado Perlemuter who leads us in our journey through half of Chopin’s nocturnal offerings. Monsieur Perlemuter chose ten excellent selections for this album, though choosing ten “best” is impossible.

Perlemuter’s technical skill is readily apparent; even for a man in his eighties, he has no problem with the most demanding passages. He has a keen sense of continuity and flow, with a moderately light keyboard touch. Never obtrusive, Perlemuter strokes the listener’s psyche with a soothing sound that often escapes other artists.

Interpretively, Perlemuter is, er, different. He combines relatively quick and steady tempi with a lot of sustain (pedaling) for an effect that, well, takes getting used to. If you own either the Rubinstein or Arrau collections, you will notice the difference immediately. Most of these pieces normally run 4½ -6 minutes;
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Perlemuter plays most of them 1-1\frac{1}{2} minutes shorter! Artistic license excluded, my preference is to linger in these pieces. . .after all, if not in the Nocturnes, where can one indulge? It’s better not to wolf down French pastries. Nevertheless, the pieces are well-played, leaving subjective, interpretive evaluation to the listener.

Like other Nimbus CDs, this shares the marks of its lineage: undistorted, clean highs, fairly “live” sound (hammers striking strings), and a realistic soundstage. Harmonics are above average.

Perlemuter’s “sampler” of the Chopin Nocturnes is valuable for the first-time listener, and should whet the appetite for a future purchase of the complete set. You can never own too much Chopin.

Note: Track 10, Op.62 No.2, is misprinted on the liner notes as Op.62 No.1 (the great B major Nocturne, not in this collection).

—David B. Alfvin

GIORDANO: Andrea Chenier
Jose Carreras, Andrea Chenier; Eva Marton, Maddalena; Giorgio Zancanaro, Gerard; Tamara Takacs, the Countess; Tullio Pane, L’Incredibile; Franco Frederici, Roucher; Gabor Vaghyely, Fleville; Klara Takacs, Berti; Istvan Roszos, the Abbe; Jozsef Gregor, Mathieu; Eva Farkas, La Vecchia Madelon; Kazmar Sarkany, Dumas; Tamas Bator, Fouquier-Tinville; Janos Toth, Schmidt; Jozsef Modvai, Majordomo; Giuseppe Parazz, Hungarian State Orchestra, Hungarian State Radio and Television Chorus

CBS MZ 423609 (2 LPS). Istvan Berenyi, eng.; David Mottley, Jeno Simon, prods. DDA. TT: 112:42

In the whole of modern Italian opera there is probably no composer and no work so generally despised by critics as Umberto Giordano’s Andrea Chenier. The opera-loving public, on the other hand, has always enjoyed it when impresarios could be persuaded to stage it, and record companies have produced some dozen or more complete recordings in the last 50 years. What audiences have loved and the critics hated has been the unbridled emotion and the occasionally sloppy singing that can result. Another reason the work is seldom staged is the absolute necessity of three big-voiced Italian singers in the main roles.

In the present recording only the baritone is actually an Italian, but the Spanish Carreras and the Hungarian Marton are both completely within the style. What is this style? First, beauty of voice; next, the ability to make the words speak; and last, to contain the emotionalism of the music and text—not to sing sharp to create a sense of excitement, nor to rant and lose the notes altogether.

This performance succeeds on all counts. If Carreras’s voice lacks the golden sweetness of Gigli in the 1941 EMI recording, he does not go over the edge emotionally as Gigli often did. Not that Carreras is cool; he isn’t—he’s just Italian enough. Eva Marton is no less convincing as the gallant Maddalena. Her aria is moving and the entire role beautifully done. She changes vocally from the silly girl of Act I to the terrified and brave heroine of Act IV. Giorgio Zancanaro, a baritone whom I don’t know, has a smooth legato style and a beautiful sound. I would wish for more menace in the voice, but he gives a fine performance in spite of sounding almost too nice for such a character as Gerard.

The lesser roles are really lesser in this opera, and the mostly Hungarian singers do well enough. There is little attempt to characterize—a direct contrast to the 1941 recording, in which each tiny part was a distinct person. The reader will have divined by now that I consider the 1941 recording to be the chief competition to the present offering. The Seraphim pressing of this 47-year-old performance is, of course, out of print, but it often turns up secondhand. I plan to keep both: the CBS for its fine sound and stylish performance, and the EMI for showing just how excited a performance can get without actually breaking down.

For this review, I had the LPs only; CBS’s Dutch pressings are silent and the stage feeling quite vivid.

—Harold Lynn

HAYDN: Symphonies 22 & 104, Piano Concerto 2
Carol Rosenberger, piano; Gerard Schwarz, Scottish Chamber Orchestra

Symphonies 21 & 96, Cello Concerto 1
Janos Starkor, cello; Gerard Schwarz, Scottish Chamber Orchestra
Delos D/CD 3062 (CD). Marc Aubort, eng.; Joanna Nickrenz, prod. DDD. TT: 68:51

The final spadeful of Hungarian earth had only just been tossed onto the coffin of Franz Joseph Haydn when grave-robbing phrenologists pursued their science to the depths and decapitated the world’s greatest composer to study the dimensions of his genius. That was in 1809. The skull was not returned to its resting place until 1954. Haydn will not leave us alone, nor we him.

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been written since then often misleads us into thinking of him only as the quaint court composer who warned Beethoven not to take the charm out of music.

On each careful listening, however, one can find variety that reopens the floodgates of wonder. His power is manipulated with such ingenious control that it becomes more powerful through his mastery over it. It is a power largely unrealized in these two samples of the Delos Haydn Celebration, with Gerard Schwarz conducting the Scottish Chamber Orchestra.

Schwarz takes a homogeneous, relaxed, rounded, genteel approach that forms a patina over the music, reducing much of it to somnolence but complementing this with some exquisitely beautiful and moving results. A quotation from Mozart about Haydn is emblazoned across the covers of both discs: "He alone has the secret of making me smile and touching me to the bottom of my soul." In the music, Schwarz has the soul-touching power; it's the smiles we're left groping for.

The third movement of Symphony 104, for instance, seems to aim at grandeur, but loses its grace in the process. Even the drum rolls are not rolls but distinct strokes. In the following movement, the relaxed bowing style distinguishes the fire found in performances by Hogwood, Dorati, and others.

The Cello Concerto No. 1 with Janos Starker is the worst afflicted. Stilted and wooden throughout, it lacks all but the slimmest ray of sunlight. There is no sense of momentum in movement one and, thus, nothing to contrast with the moments of melancholy. Movement two becomes a halting dirge, and the finale is an anemic allegro immolto. Unfortunately for Starker, the lethargy seems to be contagious.

If you can bear these and some similarly leaden parts of the two early symphonies, however, you'll find some recompense in other places. Foremost is the Piano Concerto 2 with Carol Rosenberger. The solemn stillness of the second movement is radiant and poignant. Dissonances are milked for all their bittersweetness. Rosenberger, Schwarz, and the orchestra really sing throughout the piece, and the pianist's own cadenzas are beautifully integrated in theme and style. In the finale, wit and ebullience appear in profusion.

It is in the slower movements of other works that Schwarz also finds his best voice. The second movement of Symphony 96 is certainly Romantic sounding (has Haydn ever been played more like Beethoven?), but when the results are so beautiful, almost anything can be overlooked. Also irresistible are the opening movements of Symphony 22, with its glorious interplay between French and English horns, and of Symphony 21.

The recording quality of the discs, though not in itself poor, contributes to some of the shortcomings of the performances. It is a tad thick in the mid-bass and suffers from a malady I find common to early digitally recorded analog LPs. For lack of a better term, "overtone overhang" has the effect of accentuating a note's overtones so that the instrument's fundamental tone and the sounds of other instruments seem blurred by a harmonic fog. There is also a rather distant perspective, especially on the soloists, that sounds out of proportion for a chamber orchestra.

Certainly these sound qualities cannot help performances that are rather dull on their own. But Haydn is still with us. We will not leave him alone, nor he us. Schwarz glorifies him at times, but often clips his wings. In their full measure, these recordings are outdone by those of Karajan, Hogwood, Szell, Dorati (especially), and others. Aside from a few moments of brilliance by Schwarz, the other conductors all seem to have Haydn's head screwed on righter.

—Robert Hesson

**HOLST: The Planets**
Sir Adrian Boult, London Philharmonic Orchestra
Angel Studio CDMD 69045 2 (CD). Christopher Bishop, prod. AAD. TT: 47.5

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STEREOPHILE, MARCH 1988
able on CD. Looking under "Holst" at my local Tower Records is a really depressing experience. Where is Beni Mora? Where is the Golden Goose ballet suite, or Holst's haunting Hymn of Jesus, Egdon Heath, or The Perfect Fool?

When I purchased this CD, I thought I was buying the 1967 EMI recording, with which I am very familiar. In my opinion it is the best reading of this work that I had ever heard (Bernstein's CBS being the worst). Upon reading the liner notes, I find that this is not the 1967 recording at all, but Boult's later (and last) recording of The Planets, recorded in 1979 and sponsored by KEF Loudspeakers. I was somewhat disappointed because I have never heard this performance before. I knew it existed, and had even seen a copy of it one time at a CES convention (in the Celestion speaker exhibit, I believe). At any rate, it was never released here by Angel, and although I looked, I was never able to find an import copy. Since I was unfamiliar with the recording, the first thing I did was to directly compare it with the earlier release (on LP).

First of all, the 1967 recording was a different orchestra—the New Philharmonia. One forgets these things sometimes, but other than that, the performances are, for all practically purposes, identical. The individual timings for the various movements are almost exactly the same, seldom varying a second or so one way or the other. Maestro Boult was a true master of English 20th-Century music, and his interpretations were remarkably consistent. If one compares his mono recordings of the Vaughan Williams symphony cycle, made for Decca (London) in the '50s, with his stereo performances made for EMI in the late '60s, you will find that the performances are more than similar. Played over a table radio, I defy anyone to tell them apart. The same is true of this newer recording of The Planets. I needn't have worried, this performance is essentially the same, and it sounds better! The CD is made from an analog master, so it has none of the shrillness that many of us associate with digital recordings.

The remarkable thing here is how much EMI's equipment seems to have improved in the 12 years between these two recordings. Not only is the master tape on the 1979 recording quieter than on the 1967 reading, it also is much cleaner sounding. The strings are smoother, and the brass has more bite. Imaging-wise, the later recording is about on par with the earlier. Analog EMIs were always the best of any of the large record companies in this regard, and this one is no different. The classic EMI stereo recording technique is in evidence here; that is to say, a stereo pair overall, with judicious spotlighting of instruments and ensembles always subordinate to the stereo pair. This gives a wonderful feeling of space around the instruments, and places them in their proper locations with respect to the listener.

This is The Planets to buy. Though a classic performance of an overworked warhorse, it shows that in the hands of a master like the late Sir Adrian Boult, even a warhorse can have something fresh to say.

—George Graves

MAHLER: Symphonies 9, 10 (Adagio)
Eliahu Inbal, Frankfurt Radio Symphony Orchestra
Decca 60CO-1566/67 (2 CDs). Peter Willemoes, Dietev Kitter, engs.; Yoshinari Kawaguchi, Richard Hauck, dirs. DDD, TT: 104:21

It's the rare writer who, given the task of writing about Mahler's last 1½ symphonies, can resist meditations on death and completion, and I'm not one of those few. Leonard Bernstein has said that the Ninth's finale embodied "a Zen-like immobility of pure meditation," and Otto Klemperer has spoken of "the majesty of death" revealed in the same movement. More recently, as the unfinished Tenth, like an unwelcome ghost, elbows its way into the performing repertory wrapped in the shroud of Deryck Cooke's performing edition, such positions as Bernstein's and Klemperer's have been rethought. In the minds of a gradually growing number of listeners, the Ninth is no longer the headstone of Mahler's musical life, but merely the end of a cycle which began with Das Lied von der Erde. Such important composers as Schoenberg felt that the Tenth began the next cycle, which, had it been completed, would have carried Mahler well into 20th-Century atonality and a whole new landscape of musical absolutism.

But Schoenberg had an axe to grind, and heard what served his purposes. Having listened to all the recordings of the Tenth, I lean more

1 This has long been my favorite performance on record. And the good sound almost wasn't! Thank the inability of EMI's engineers to get their early digital recording system together in time for the sessions, because, as I understand it, KEF had agreed to sponsor the recording on the grounds that it was going to be one of the first EMI digital recordings. Luckily it wasn't. However, when it was released on LP, it proved impossible to obtain a copy with surfaces that were anything like quiet—so welcome the CD issue.

—JA

Stereophile, March 1988

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toward Bernstein's view: that the Ninth was Mahler's final statement. The Tenth, rather than a leap "forward" in musical evolution, sounds more to me like a rehash of Mahlerian tropes, a return to the obsessive self-involvement he had transcended so triumphantly in 8, 9, and Das Lied; a symphony that, in Mahler's final analysis, did not need to be finished, this realization allowing him to die in what little peace was left to him. He did, after all, instruct his wife to destroy the manuscript after his death. But my assertions are as unproviable as Schonberg's, and just as self-serving.

Eliahu Inbal has chosen the middle ground of conducting the Ninth as Mahler's last will and testament, and recording only the Adagio of the Tenth. He has now completed his Mahler cycle with the FRSO, and in the record time of only slightly more than a year. Their performances of symphonies 4, 6, 7, and 8 are as good as they come; 4 and 8 get my votes as the finest ever, with 7 not far behind. The present reading of 9, though not consistently excellent enough to replace your favorite recording, remains a uniquely essential alternative for serious Mahler listeners.

First off, the brass: throughout the symphony, but particularly in movements 1 and 4, brass parts are emphasized in a degree and manner previously unheard. The degree is great, the manner silken—brass played as violins. Sour, sweet, yearning, angry, the FRSO's clear- and sweet-toned brass players are made to carry the first movement—no other conductor has even attempted this. It works very well; viz the soured, lengthened, muted trumpet chords 15m from the beginning.

There is wonderful clarity, too, in the woodwinds, and, 19m into this movement, are softly played orchestral gongs I've never heard before. (Though the martial strings just after this lack the requisite bite to make sense of the passage.)

Inbal does not fare so well in the two middle Scherzi. The nasal, ritarded winds at the opening of the second movement sound like so many rackets and saxes; attacks are puffy, legato, the tempi sluggish, as if trying to awake. There is only two seconds' difference in time between Solti's and Inbal's versions, but Inbal's sounds much slower. Cadential ritards throughout make for a saccharine, overly Viennese, Schlagoberish feel. The spinning waltz is never quite abandoned enough to get off the ground, and the closing contrabassoon/piccolo duet is botched. But the brass shine through in this movement.

As they do, again, in the Rondo-Burleske. There are accents, notes in the low brass that I've never heard before, even in Klemperer's lovingly slow vivisection of this symphony. There is not quite Solti's ferocity here, but then no one has that. A conventional reading, not really in keeping with the rest of Inbal's interpretation.

But the soul and skeleton of the final Adagio are laid bare, making my mouth water to hear what Inbal might do with Tristan. Leading phrases drift by, slowly fading as others come forward to sing, but remaining clearly, if quietly, discernible as they recede. Inbal's fine, fine weaving on this great loom is a remarkable achievement, and ends with the most legato, tender caresses this movement—even with so many excellent recordings available—has ever had.

Comparisons: If you can stand the awful CBS sound, the Walter/Columbia recording has a warm grandeur, with rich but naked orchestration. Solti may be letter-perfect in the Rondo, but Walter swings. The horn/double-bass/piccolo counterpoint at the end of the Andante is a uniquely dramatic struggle to regain rhythm, key, and pulse, but Walter, after measured paces throughout the symphony, inexplicably rushes through the end of the Adagio. The Tennstedt/LPO performance is likewise plagued by bad sound (courtesy EMI), not to mention Tennstedt's raucous romanticism and boorish over-articulation of theme and accent. Klemperer/New Philharmonia, again EMI (though much better sound), is grand, broadly felt, expansive, epic, with astonishing clarity of recording and conducting. Klemperer seems intent on bringing out every instrumental line in a naturally miked recording. The Landler waltz is here actually danceable, not desperate, though the slow pace often loses the pulse and too many staccato passages are legato'd to death. For a complete vision of this work, I'll take the Solti/LSO; for analysis, Klemperer; for a revisionary reacquaintance, Inbal. (Christopher Breunig prefers the new Bernstein/Concertgebouw.)

Bernstein, Kubelik, and Solti, all of whom have recorded complete Mahler cycles, have kept their hands off the unfinished Tenth, not even so much as recording the oft-played
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Adagio. Of "complete" performances of the Cooke versions, Ormandy recorded it first, with the Philadelphia, and was simply over his head. Levine's 1978 early digital recording, with the same orchestra, is stuffy, constipated, and passionless, with strained, thin sound. Only Simon Rattle, with the Bournemouth SO, seems to have made any worthwhile sense of the symphony, but it seems a thankless task to me.

Inbal's excellent Adagio shows off his by-now iron—and revelatory—control over strings and brass; there is a clarity here that exists in no other reading. Interestingly, there is no orchestral bottom in the great, organ-like, nine-note chord at the movement's climax. But though the performance is flawless, it's not darkly felt enough for my tastes; for that I prefer the Tennstedt/LPO recording, which is wonderfully full-bodied and -throated, passionate, well-proportioned and well-recorded throughout—it's hard to imagine an improvement on it.

Denon's sound continues its impeccability, with the immediacy of a live performance and the careful, clear sound of the ideal recording session. Again, the bulk of the recording was done with two mikes, with only occasional assistance from Denon's digital time-delay alignment setup. All in all, with the above qualifications carefully noted, another recommended performance from Inbal and the FRSO, and a quiet, reverential conclusion of their Mahler cycle. —Richard LehnerT

RACHMANINOV: Symphonies "Youth," 1, 2, 3
Vladimir Ashkenazy, Concertgebouw Orchestra

These three performances were first issued on full-price LP and cassette in 1982 and '83, then in boxed-set form with The Bells, Op.35. Their coupling on CD (without the Choral Symphony) at mid-price makes a very attractive package indeed, for Ashkenazy's interpretations are so idiomatic, so responsive to Rachmaninov's emotional but rarely sentimental concepts, that even if they don't emerge as a first choice they do offer a consistent view of this music that is entirely enthralling in its motivation and vigor. The normally cool Concertgebouw responds with a warmth and verve I have rarely heard from them; this must be entirely due to the strength of Ashkenazy's commitment and vision.

The first performance of Symphony 1, conducted by Glazunov in 1897, was an utter fiasco, and for three years Rachmaninov's confidence as a composer was sapped until hypnotherapy from Dr. Nikolai Dahl in 1900 released the creative power that culminated in the success of the Second Piano Concerto. The symphony was never performed again in Rachmaninov's lifetime, a neglect difficult to understand, even taking into account the work's darkly turbulent nature and some emotionally strange themes and instrumentation. The articulation of the Concertgebouw is splendid here, and they are rhythmically taut, even at some of Ashkenazy's speedy tempi. Equally praiseworthy is their immediate response to the dips and swells of dynamic that he calls for. The spacious acoustic of the Amsterdam Hall is, as in the other symphonies, handled here with great skill, the full width and depth of the soundstage faithfully reproduced with yet more ambient space around it, so that this potentially congested score emerges with clarity. Only in the final movement does it become obvious that the battery of percussion instruments is unable to hear its string counterpart, prompting it to race away at certain moments. Some highlighting of instrumental entries is sensitively done, and wholly acceptable in view of the advantages gained.

The 1907 Symphony 2 is given "uncut," as in most modern recorded performances. Here Ashkenazy is equally thorough and spontaneous, his innate musicality judging all climax-building to a nicety, and timing instinctively the passionate surges inherent in this emotive score. The first movement is taken with dark intensity, its yearning quality rendered beautiful and moving. I wish the same were true for the Adagio third movement, for here the wonderful theme on clarinet, well-played but with a thin, reedy tone, develops little of the sensuousness so essential to its nature. The string recapitulation of the theme, though, is everything it is required to be, and with each hearing I have warmed to the uncharacteristic sense of urgency that Ashkenazy feels at the opening of this movement. Both Scherzo and Finale are vigorous, highly charged, and exciting in their persistence, but here I find that Ashkenazy's audible rhythmic promptings break concentration; it is a pity that they could not have been mitigated.

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phony was composed, during a stay in Switzerland. Rachmaninov had long since left Russia and concentrated on a career as a concert pianist, which soon brought him international fame. Time for composition had, until then, been limited, but the structural cohesion of this large work shows that Rachmaninov had lost none of his creative integrity. Its three movements are linked by a motto theme which combines in the *Finale* with the *Dies Irae*, the plainchant that haunted Rachmaninov throughout his life and appears in almost every one of his major works and in each movement of Symphony 1. Ashkenazy's performance of Symphony 3 is perhaps the most volatile of the set, with impulsive changes of speed and some truly impassioned surges of dynamic. Yet spontaneity never overrides control, with warmth reflecting not only from the Concertgebouw's full-bodied sound, but also from its dedicated response.

On this final disc is the added bonus of the "Youth" Symphony of 1891. It consists of only a single movement, probably intended as part of a larger work. Although it lacks real depth, it is enjoyable and worth hearing, if only to reflect on Rachmaninov's awakening talent in embryonic form. This is a good-value-for-money set not to be missed; there is little here to disappoint.

—Barbara Jahn

**SIBELIUS: Symphony 5 & Pohjola's Daughter**
Esa-Pekka Salonen, Philharmonia Orchestra
CBS 42366 (LP), MK 42366 (CD). Bud Graham, eng.; David Mottley, prod. DDD. TT: 47:16

With the ink scarcely dry on the Ashkenazy/Philharmonia contract to record the Sibelius symphonies for Decca, CBS announced that Salonen, too, was to undertake the cycle. In the event, that was apparently an error (Ashkenazy did his Fifth as long ago as 1980!), but this is the third Sibelius 5 CD by this orchestra, if ultimately the most questionable.

Salonen takes a provocatively distant stance: that much is evident from the opening pages, with phrasing that is suave, elegant, the wind chording sweetened. Limpid textures—or limp-wristed? Most commentators have found the reading structurally weak, especially when so willfully slow in (ii). I rather suspect the young Finnish conductor's grasp is tighter than first hearings would suggest. In a curious way, his Fifth, with its wintry soundscapes and avoidance of the grandiose (the commitment seems deepest in the lighter-textured rhythmic patterns of repetitious figures), reminds me of the old Philadelphia/Ormandy mono recording (1956), although the two versions have little in common when it comes to detailed comparisons. Where Sibelius indicates timpani grace-notes before the last two of the big spaced chords, Salonen exaggeratedly detaches these and thus, for me, at the very last fence, forfeits credibility.

His *Pohjola's Daughter* can be faulted more seriously, for all its atmospheric characterization. Largely this is a matter of recording (and, I rather suspect, of editing), for the brass really crowd the picture at climaxes—so they do in Rattle's EMI Fifth, also from Abbey Road Studio 1. But then, is the "atmosphere" the right one? Dip into the etiolated, withdrawn codas: the unsuspecting listener would undoubtedly guess at late Mahler. It's possible that Sibelius heard his music in this way, but I would say not probable. Turn to Colin Davis, in his great Boston/Philips recordings, and the Sibelian qualities are still there as the music recedes into the distance. Or compare the waves of timpani that herald the crescendo and start of the "journeying" theme at the beginning of the work. Davis gets a black, ominious sound, where the Philharmonia timpanist merely makes a skeletal, mechanically precise, dramatically void sequence. In dramatic continuity Davis is superb; Salonen is so discontinuous as to make you wonder how many different takes are pieced together here.

To be frank, I like Salonen's Sibelius where it is most unconventional: the second movement of the symphony may be slow, but its growth is handled well. I am less happy with the braking of the natural momentum in (i), though. The perspective/dynamics relationships here strike me as wholly false, in David Mottley's production, and that is a disappointment. It's a case of "file under P"—not for *Pohjola*, but for provocation.

—Christopher Breunig

**RICHARD STRAUSS: Piano Works**
*Stimmungsbilder* for piano; *Burleske* for piano and orchestra; *Parergon* for piano left-hand and orchestra
Ian Hobson, piano; Norman Del Mar, Philharmonia Orchestra
Arabesque 26567 (CD). TT: 60:10

This recording stands in rebuttal to those who think of Richard Strauss only as a composer of tasteless and overscored tone poems. It con-
tains about half of the music he wrote for piano, an instrument not usually associated with him. The nature of the music is surprising, too, especially the two youthful works Stimmungsbilder (“Mood Paintings”) and Burleske. The former, composed in 1884, comprises five sketches for solo piano. It is fascinating not least because its parts reflect not only the obvious influences on the young Strauss—Chopin and Schumann especially on “Auf stillem Waldespfad”—but also the strong influence of contemporary currents. “An ein- samen Quelle” is obviously impressionistic, and “Heidebild,” while German in thematic development, almost anticipates Ibert or Stravinsky in its harmonic economy and angular rhythm.

Burleske (1885) is more familiar. Two other recordings are currently available on CD: Janis/Reiner (CBS 5734-2-RC), and Serkin/Ormandy (CBS MK 42261, recently reissued on the “Best Value” midpriced series). While this one-move-ment work lacks any consistent thematic argument (throughout its course come and go snippets suggesting Brahms, Chopin, and of course, Wagner), it becomes quite enjoyable music, once one ceases to expect to hear a concerto and accepts Burleske as the piano-centered romp it meant to be.

The 1925 Parergon, or addendum, to Strauss’s Sinfonia Domestica, is quite a different work. This is a mature piece, more impressive but perhaps less involving than the two earlier works. It was commissioned by Paul Wittgenstein, a renowned pianist who lost his right arm in WW I. (Wittgenstein also blessed the music world by commissioning the Prokofiev Fourth Piano Concerto and Ravel Concerto for the Left Hand, among other works). The most prominent of the Sinfonia Domestica’s several leitmotifs is the notorious Baby in the Bathwater theme; that same baby son is portrayed here 22 years later, grown up and fighting a desperate battle with typhus, contracted while on his honeymoon in Egypt. The symphonic rhetoric is, if anything, more programmatic than Sinfonia, with literal orchestral battles between the protagonist son Franz (readily identifiable as piano) and his near-fatal disease (ostinato brass and tympani). Yet the central presence of the piano—deployed not in the formal concerto sense, but rather as the domi-nant voice of orchestral storytelling—makes the work seem more concentrated, less bom-bastic and turgid than other, more famous Strauss tone poems. (Of course, this is still Strauss, so the work is nonetheless pretty turgid.)

Pianist Hobson plays this sometimes thick music with welcome clarity and restraint, and no small measure of panache. This is splendidly effective in Stimmungsbilder and Burleske, but his playing may be a little refined for Par-ergon. Such an outpouring of a work requires more pugnacity in the exchanges with orchestra, more flexibility in the Straussian glissandi and sforzandi: touches perhaps tasteless, but here expressively necessary. Del Mar conducts the two orchestral works with intelligence and swagger. He’s long been celebrated for his performances of British works (his recording of Britten’s Noye’s Fludde, now 25 years old and available on Argo ZK, has long been a reference disk). I’m glad to see him so successful at the Teutonic as well. —Kevin Conklin

EDUARD TUBIN; Symphony 1; Concerto for Balalaika and Orchestra; Music for Strings
Emanuil Sheynkman, balalaika; Neeme Jarvi, Swedish Radio Symphony Orchestra
DDD. TF: 68:40

Although a good deal of Eduard Tubin’s music—including eight of his ten symphonies—is available on CD, it is seldom performed in America. This recording, in fact, provided my own first exposure to any of it. It will be a while before I decide to venture a second.

Tubin was born in Estonia in 1905, where he studied composition with Heino Eller and Rimsky-Korsakov protege Arthur Kapp. He also worked under Zoltan Kodaly in Budapest, then settled in Sweden in 1944, remaining there until his death in 1982. The works on this release span the years 1931—which marks the beginning of his First Symphony—to 1964, the completion date of his Balalaika Concerto.

While his later efforts may exhibit further stylistic growth, these three are remarkably similar in both emotional content and the manner in which it is expressed. For this listener that proves a distinct liability, given the music’s near constant state of urgency and intensity. Within any given movement there are contrasts of mood to be sure, but as each piece unfolds one is struck by—and ultimately annoyed by—a series of climaxes that billow forth with tedious regularity. Serving to undermine rather than heighten dramatic impact, they seldom emerge as the inevitable outgrowth of mount-
ing energy but as increasingly predictable plateaus of bluster and bombast.

All of the music represented here is tonal (in the broader sense that Hindemith's music is tonal), and in it one finds reverberations of folk song, the modern Russians (most notably Shostakovich and Prokofiev), Mahler, and Bartok. In fairness, however, at its best Tubin's amalgam of neo-Romanticism and expressionism is imbued with a strength and richness very much his own design. A skilled orchestrator and solid craftsman, he also knew how to write a good tune; the oboe solo midway in the symphony's first movement, and the opening phrases of the concerto's middle movement, are thoroughly captivating. Disappointingly, such genuinely poignant interludes are never allowed to bloom, and ultimately, in the symphony and concerto, get lost in yet more blasts of brass and kettledrums.

By this point you probably won't be surprised to learn that the Balalaika Concerto was not conceived as a pleasant divertissement to accompany lunch at the Russian Tea Room. Indeed, its mood is pervasively somber (not withstanding an Allegro giocoso finale with nary a trace of the giocoso), and much of the time the balalaika part sounds like an obbligato to a piece for orchestra. But within this context the soloist is frequently presented with roulades of notes requiring considerable dexterity and not a little courage. Put simply, the playing of Russian-born and -trained Emanuil Sheynkman is absolutely masterful in every regard.

Decidedly less commendable is the amount of extraneous noise—sounding vaguely like rushing water—allowed to intrude on this all-digital product. Not as constant as tape hiss, it is most noticeable during quieter sections; at the outset of the Music for Strings it even competes for prominence with the music itself. Otherwise, BIS's recording team has captured an impressive amount of information from Stockholm's Berwald Auditorium. The soundstage is wide, the illusion of depth convincing, and instruments are clearly placed. Only occasionally do upper strings and brass exhibit a steely edginess; the Swedish RSO's performances exude assurance and solid musicianship throughout. —Gordon Emerson

It's always surprised me that Lobengrin, Wagner's most awkward, transitional, and static opera, was, for its first 100 years, his most popular. It didn't help, I suppose, that I began my study of things darkly Teutonic with The Ring and Tristan, working forward and backward from there. In Lobengrin we can hear the last reluctant pullings away from operatic conventions—especially choral—of the first half of the 19th century, and the gropings toward full-blown musikdrama—especially in Act II, scene i. The pace is slow, even for Wagner, with a portentous reverence unrivaled even by Parsifal, and the character of Lohengrin, even less human than the out-and-out gods, dwarves, and dragons of The Ring, is so endlessly correct, never once succumbing to self-doubt or even second thoughts, that identification with him is difficult (although that didn't seem to stop Ludwig II, who wove an entire life's worth of expensively castled fantasies around the legend of the Swan Knight).

After living for some time with the authoritative 1963 Kempe/VPO recording, with its once-in-a-lifetime cast of Jess Thomas, Elisabeth Grummer, Christa Ludwig, Fischer-Dieskau, and Gottlob Frick, it was hard to imagine a better performance. In many ways, that recording has not been bettered here—certainly not in the soloists. (With the exception of Frick, who did an excellent job but whose voice is simply too black for Heinrich. In the otherwise unnecessary Kubelik/Bayerische Rundfunk performance, Karl Ridderbusch, one of my favorite baritones, is a much better choice.) It's hard to imagine a more grippingly dramatic Act II Telramund/Ortrud scene, with two such consummate vocal actors as Fischer-Dieskau and Ludwig ripping into each other, and Thomas and Grummer are perfectly matched in nobility of purpose and purity of tone. And, of course, there's always the 1953 Keilberth/Bayreuth recording (Richmond, ope), whose rough and ready vigor is unfortunately countered by poor recorded sound (see John Culshaw's Putting the Record Straight for the rather political explanation), but which preserves an indomitable Astrid Varnay as Ortrud and an oddly introspective Windgassen in the title role. (There's also a long-out-of-print

**WAGNER: Lobengrin**

Placido Domingo, Lobengrin; Jessye Norman, Elsa; Eva Rand-ova, Ortrud; Siegmund Nimsgern, Telramund; Hans Sotin, Heinrich; Dietrich Fischer-Dieskau, Heerrufer; Vienna State Opera Chorus; Georg Solti, Vienna Philharmonic Orchestra London 421 053-1 (4 LPs), 421 053-2 (4 CDs). James Lock, John Pellowe, engs.; Christopher Raeburn, prod. DDD. TF: 222:54

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Stereophile, March 1988 171
Leinsdorf recording, which I remember for a rousing Act I swordfight and little else.)

Such strong competition makes Georg Solti’s achievement all the more welcome. There has always been an epic inevitability in his conducting of Wagner, and it is hardly lacking here, as is evident from the first bar of the perfectly built Act I Prelude. There is a wonderful, uncloying sweetness in the opening string octet, and it builds seamlessly to a stunningly prepared-for climax. Throughout, his handling of Wagner’s one- and two-note string and brass punctuations in the tenser scenes are tight, dramatically perfect. Solti has been taken to task elsewhere for his slow tempi here, but if indeed they are slower (I’m not convinced), such is his intensity, drive, and analytical passion that they hardly lag.

This is most evident in the long choral passages. More than any other of Wagner’s operas, a Lohengrin lacking stellar soloists can stand or fall on the precision of its choruses, and Solti’s (and chorus director Walter Hagen-Groll’s) direction is bracingly alive, fully involved in the dramatic action, emotionally demonstrative, and musically precise in the many dense split-chorus passages. The complex counterpoint at the first sight of Lohengrin in Act I is heard with perfect clarity for the first time on record, and the same act’s finale is triumphant; the entrance of the women in II.iv., too, sends chills up the spine. Of course, the Vienna State Opera Chorus is famous for the powerfully rich, dark, male tones that one seems to find only in native German-speaking choruses. In short, this most intrusive of Wagner’s “Greek choruses” here enjoys a performance unequalled anywhere.

Placido Domingo’s is a sensual, emotional Lohengrin, quite unlike the severely spiritual Jess Thomas’s. His reiteration of “Nie sollst du mich befragen” is bitingly insistent; “In fernem Land” is masterfully structured: hushed, triumphant, reverent, and proud by turns; but “Mein lieber Schwann,” though achingly tender, is marred by Domingo’s theatrically correct but sonically muffled turning away to address his upstage swan. Jessye Norman gives the impression of endless vocal reserves, so effortless is the power of her floating, perfectly supported tones. But she lacks emotional urgency; in this case, the emphasis is on the music, not the drama—her Elsa seems never to leave the dreamy reverie of her opening Act I narration until Act III. Hans Sotin is a strong, warm Heinrich, though not as supple as Ridder-
busch; Siegmund Nimsgern's Telramund is solid, but smacks more of Alberich's strained posturing; and Eva Randova's Ortrud, though assured and considerably more than adequate, simply cannot compare with those of Ludwig or Varnay. A delightful treat, however, is Fischer-Dieskau as the Heerrufer: in reviews of his recent lieder recordings, much has been made of the inevitable deterioration of his voice; but in the opera studio, at least, his singing is unimpaired. This compulsively human singer brings life to this cardboard part as no other has, and with great force and musicality.

For this, the conclusion of Solti's Wagner cycle for London/Decca, he returned to the VPO after the misguided CSO Dutchman, and that orchestra is in fine voice—the brasses and woodwinds are strong and mellow, unlike the CSO's often stentorian harshness, and the Sfiesaall's liquid acoustic serves this digital recording as it always has: extremely well. The Act III Bridal Chorus, for example, is begun far, far back in some remote side-hall, and approaches with slow, even stateliness. Solti conducts here with almost Handelian lace and grace, coaxing the fine textures of the vocal writing to match the opening strings' etherialness in the Act I Prelude.

For the sheer vocal power of its cast and the resultant compelling drama, the Kempe recording remains unparalleled. But in all other ways, including exciting, gripping drama from the podium, and orchestral sound of great fullness and beauty, I heartily recommend Solti's heroic Lobengrin.

—Richard Lehnert

VAUGHAN WILLIAMS; Job—A Masque for Dancing
Vernon Handley, London Philharmonic
EMI Eminence CD-EMX 9566 (CD). Mr. Bear. eng.; Martin Compton, prod. DDD. TF: 48:21

Job, surely one of Vaughan Williams's finest works, has had far greater currency on recordings than in the concert hall, or on the ballet stage for which it was conceived. Based on William Blake's Biblical illustrations, Job is not what we immediately think of as the stuff of which ballet is made.

Its beginnings seem auspicious enough in hindsight. Job was conceived in 1928 for the Vic Wells Ballet, which became the Sadlers Wells, and which is now the Royal Ballet of Covent Garden. The choreographer was Ninette de Valois, who daringly created a work which relied mostly upon mime, with the principal dancing being a role of the most intense virtuosity for Satan. Although quite successful in London during the '30s, Job was given only one brief series of performances as a ballet in the United States during the Sadlers Wells' first tour of this country in 1949, and only in New York, at the Metropolitan Opera House. Although still listed as repertory of the Royal Ballet, it is rarely revived at Covent Garden.

Job had a single valiant champion among American conductors: Thor Johnson, who gave the US concert premiere with the Cincinnati Symphony, and performed the work often as guest conductor with other orchestras. Otherwise, this great work remains unplayed by more major orchestras than have played it.

Its history on record, however, boasts no less than four recordings prior to this one, each led by Sir Adrian Boult, to whom the score was dedicated. These recordings spanned the age of HMV 78s, featured the best of the mid-'50s London "ffrr" mono approach, included a Bert-Whyte-engineered stereo Everest, and concluded with an excellent EMI stereo from the late '60s. Vernon Handley stepped into one big pair of shoes when he accepted this assignment, and I'm here to tell you that Vernon can handle the job.

The Blake illustrations which inspired this work came from a mind not institutionally religious or dogmatic, but deeply spiritual in an intuitive sense, a type of mystic spirituality which Vaughan Williams greatly shared. Out of this has come a work which contains passages of some of the most moving lyric intensity in 20th-Century music. There are a few fascinating devices as well, such as a tenor saxophone to portray Job's devious comforters, and a brief and shocking burst of organ playing for Job's vision of Satan seated upon the throne of God. Handley and the London Philharmonic really do play this music beautifully, with a cohesive sense of communication which goes well beyond the microphones. The performance should provide a model for other conductors to learn this piece and perform it. The production, recorded in St. Augustine's Church, London, is absolutely first rate, the sound of a single solid orchestra in an ideal acoustic setting. Every strand of inner detail is clear and convincing, yet nothing sticks out, and it is remarkable for its lack of digital glare. Like the performance itself, the engineering is a model for digital recording of wide dynamic music for large orchestra.

Stereophile, March 1988
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Stereophile, March 1988
This interesting recital disc by the excellent American bass Samuel Ramey shows both his strengths and his weaknesses. I should hasten to say that the weaknesses are probably the result of Philips repertory people choosing a couple of arias which Ramey does not find congenial. Specifically these are Leporello's aria, which lacks humor, and the Rinaldo aria, which is blustery. That out of the way, the rest of the recital ranges from superb to magnificent. Attila is one of Ramey’s great roles, and he gives the scene tremendous strength and vocal variety. In this excerpt he is not well supported by the conductor, who appears not to enjoy the vulgarity of early Verdi.

To my ear, the best singing on the disc is the Sonnambula "Vi ravviso." I can’t think of a bass since Pinza who could sing such elegant long lines. In spite of the general misuse of the words, I will risk saying that this is real bel canto. The long scene from Semiramide has a short cut—I can’t imagine why. Luckily it is in a chorus part, not in the soloist’s music.

The last item on the recording is the most pleasant surprise. Montemezzi’s Love of Three Kings is one of this century’s masterpieces, and the role of the old blind king is perfect for Ramey, who does a beautiful job with this most moving scene. Let’s hope that Philips is using it as a test for a complete recording of this unjustly neglected work.

One of the many pleasures of this recital is listening to the singer alter his sound to each of the characters he represents. Many of today’s singers aren’t interested in vocal characterization—or perhaps just can’t manage it. Ramey can and does. —Harold Lynn
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solitary, predatory romanticism. Then again, maybe there's no parody intended, and he's simply written several songs below his accustomed standards.

While Beté Noirë has its bad moments, it also contains songs worthy of Ferry. "Zamba" is a short, strong piece, with classic Ferry objectification (and elevation) of the unobtainable female. And with refrains such as "How could I know her madness'd cling/From the time of her first caress/To the final fling" (from "The Name of the Game") and "I know you—inside me/Like poison, like wine/Now there's no sense in falling/Say you'll be mine" (from the title cut), we are in the realm of poetry, which Ferry has given us so much of these last fifteen years. Beté Noirë simply doesn't provide enough such poetry to be excellent, and its musical context is rather anemic throughout.

It is a reflection of the confused and entropic state of rock that one of its best practitioners has produced less-than-excellent work.

Over the past several years, I have frequently gotten the flashback that it's 1974 all over again: Frank Zappa has degenerated into comic pornographer; King Crimson has supernovaeled after delivering its most incandescent and apocalyptic music; millions of suburban kids crowd hockey rinks throughout the continent, listening in cannabanoid rapture to tired prog-rockers. Rock has become predictable, derivative, and sterile. But there is once again that feeling of inchoate energy, that Talking Heads and Television and Blondie and, yes, Bryan Ferry and Roxy Music will arrive soon to make things dangerous, and interesting, again.

—Kevin Conklin

VAN MORRISON: Poetic Champions Compose
Mercury 812 585-1 (LP), 2 (CD); Mick Glossop, eng.; Van Morrison, prod. AAD. TT: 48:15

The Mood King of Rock is back. Van Morrison is a survivor. He was the lead singer of one of Britain's first-wave bands of the early to mid '60s. (His group, Them, was Irish, but their music was brought here amid the rush to find more "Beatles-type" rock groups at the time.) One of FM radio's mainstays and a favorite on college campuses in the '60s and early '70s, his beautiful new album is his fourth for Polydor.

Morrison has always been able to create a mood, one that today would be right at home on 'Adult Contemporary,' "Soft Rock," "New Age," or even "Free Form Rock" (if there are any left) radio stations. That mood is continued on Poetic Champions Compose. In addition to seven new Morrison songs, there's an incredible rendition of "Sometimes I Feel Like a Motherless Child," and three instruments in which he honors us with some of his really fine saxophone playing. This brought back fond memories of a concert I attended back in 1969, which also began with Morrison leading the band on sax.

No surprises here—the production is straightforward and tasteful, and the songs are pure Van, down to the tinkling piano and the female back-up singers. Listening to the record, new yet familiar at the same time, is like rekindling an old friendship.

Poetic Champions Compose is one of the few AAD CDs that sound as good as the LP. The choice is up to you.

—Gary S. Krakow

FRANK ZAPPA: Peaches En Regalia

This, the first commercial CD single ever released, is a three-cut sampler from Ryko re-releases of Zappa albums. Ryko claims you can play the single in your portable CD player, or on full-sized machines (those utilizing sliding drawers) with an adaptor. They are mistaken. Without the adaptor, I could not get Peaches to play in my Sony D-7. At best I heard two notes before the Sony turned itself off. 2 The adaptor (free to $0.98, depending on the store), is a dark gray, hard plastic centering ring that fits around the outer edge of the single like an outer doughnut. Forget the inadequate installation instructions; just make sure the playing side is unhampered by the small plastic "lips."

On the plus side, the CD-single-plus-adaptor combination does work in all other machines I've tried it in, but best with a Euphonic Technology CD ring placed on the top of the adaptor.

Was this worth all the trouble? No! Not for 13 minutes of music that Zappa has altered. I'd rather listen to the LP versions. Manufacturers are threatening to produce "singles-only" CD players. What for? I agree with JA (Vol.11 No.1) —why not use full-size CDs? One can only hope the CD single goes the way of CD-4 or the Elcaset.

—Gary S. Krakow

2 I seem to have had better fortune than Gary in that these CD-singles do play in my Sony D7. The gods must be smiling on me.

—JA
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Stereophile, March 1988
Mordaunt-Short System 442 loudspeaker
Editor:
First and foremost, it's very rewarding to read a review whose thoroughness and thoughtfulness mirrors that underlying the design of the product itself. Second, it's even more rewarding to read a review that is as complimentary as this.

We are very happy with Martin Colloms's description of System 442 (except that the dome's coil former is titanium, like the dome itself—not aluminum) and with his assessment of its abilities, both measurable and audible, but there are a couple of more general points we are grateful to have this opportunity to make.

A few years ago, any loudspeaker that demonstrated an anechoic, on-axis amplitude response notch at 200Hz would have been considered a non-starter by most right-thinking folk. The ideas that found expression in System 442 would not work without the rear drive-unit, and the benefits this bestows both upon the loudspeaker design as a totality and, even more importantly, its overall performance as enjoyed by the listener, are, in our view, of much greater importance than the shape of the anechoic amplitude response.

That it is now possible to develop such a product, and to have it accepted as well, is an encouraging sign both for those designers who might formerly have felt themselves constrained to operate within accepted wisdoms, and for those manufacturers who are prepared to back their designers with the necessary investment of time and resources. Significant advances depend very extensively upon such a combination of questioning and faith.

And, yes, the smell of the rubber mat does wear off!

Christopher Short, Managing Director
Mordaunt-Short

American Audio Labs P-9 and P-12 CD players
Editor:
Thank you for allowing us to comment on your evaluation of the American Audio Laboratories P-12. We appreciate the effort put forth by Tom Norton in his CD-player survey. It is reassuring to find another listener's perception of the player's sound similar to our own. We encourage buyers to audition our latest players (sn. 10400 and above) for a lack of digital glare.

Each American Audio player goes through extensive testing, as Tom mentioned. The problems encountered with his unit appear to have been caused by shipping damage. I can assure you that an undamaged P-12 will out-track 70% of the Philips players available.

During initial design of the player, we auditioned various passive components that would be used in the machine. We found the LSI interconnect to be the most consistently neutral cable tested. Realizing that it was presumptuous to choose a cable for an audiophile, we now ship all P-12s with Tiffany jacks installed on the back panel.

Again, thank you for the review.

Douglas W. Guth, Research Director
American Audio Laboratories

Audio Concepts/MSB mod CD player
Editor:
We wish to thank Tom Norton for his thorough review of the MSB modification for Magnavox and Philips players. Since I last spoke to Tom, we have successfully added the circuit to several other players, including the newer 471, 472, and 473 Magnavox units, and the new Philips 960 unit. We recommend the 472 as the best unit to mod for the price.

Tom's point about the thump is well-taken; we do actually recommend leaving the unit on all the time. Adding circuitry to eliminate the thump without compromising sonics would be too expensive to justify. Again, thanks for the review!

Mike Dzurko
Audio Concepts, Inc.

Fostex M22RP/S M-S microphone
Editor:
Obviously, I'd like to thank JGH for taking the time to evaluate the Fostex M22RP/S M-S microphone. As you noted, it was originally designed for use by broadcast, film, and video engineers. It is also extremely successful as a
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"stereo perspective" or "room sound" mic in recording studios where the very low bass information is handled by other microphones specifically designed for such response. It is extremely difficult for a true M/S mic to have excellent bass response below 80Hz or so; design improvements in bass response usually result in a deterioration of the spatial perspective. On the other hand, we have made excellent tapes of classical guitarists, as well as choral groups, using only the M22RP mic. Some readers may want to try the excellent Neumann RSM-190S M/S mic. It has a more extended high end, but the low frequency response is identical to the Fostex M22RP. The Neumann is also more than twice the cost of the Fostex ($2500+) and requires phantom power.

One potential of misunderstanding is JGH’s statement that coincident mic pairs can be summed for mono without any signal degradation. Perhaps neither one of us is using the correct terminology, but what are often referred to as "coincident stereo pairs" such as crossed cardioid, bidirectional, and stereo X-Y mics cannot be summed for mono without degradation! When summed for mono, these mic techniques change the sound (you get phase cancellation). This is why true M/S stereo mics (the M22RP, Neumann RSM-190S, and Sanken’s new model) are used by broadcast, film, and video people: if they have to create a mono mix, the "soundscape" is not altered from the stereo version.

In addition, I recommend the MS-380 active matrix box from Audio Engineering Associates for those who wish to actively "tamper" with the stereo perspective of any M/S mic. It has line-level outputs so that it can be plugged directly into the tape recorder. While not expensive, it is sonically excellent.

We have just released a "stripped-down" version of the M22RP that uses a less expensive housing and deletes the flight case and M/S box. Instead, you get a 3-cable XLR adapter for plugging into three separate channels—left, right, and mid—of your mixer (altering the levels changes the perspective), or use an M/S box. It’s called the M20RP and is available now for just $700!

In sum, I agree that it would be nice if M/S mics like the M22RP had better bass response in the 40-80Hz region. However, when I close my eyes while listening to recordings made on such mics, and "fall into" that all-too-rare three-dimensional spatial perspective that makes the musical experience seem so much closer and more alive... I’m hooked.

Mark Cohen, Vice President
Sales & Marketing, Fostex

Aphex ESP-7000

Editor:
Thank you for the opportunity to address your readers directly.

There are serious flaws in Mr. Sommerwerck’s analysis. The calls I made to him were not to "knock" other decoders, but rather to give him additional information upon which to make his judgments.

The "spillage" reported on the Clash cut and on the "glurg-glurg" test is due to the fact that the sources were not truly mono. A bare matrix without logic would be able to cancel surround from a true mono source (if A = B, then A - B = 0). Logic enhancement is for adjacent-channel separation.

The logic in the ESP-7000 is proportional and has a wide dynamic range. That means that signals will be properly placed regardless of level. What Mr. Sommerwerck heard was the phase difference between Left and Right input.

The Shure decoder has thresholds for separation enhancement and only one threshold for the Surround channel. This "switching" will cause things to "pop out at you," as Mr. Sommerwerck accurately described.

The problem is that the decoding action is input-level dependent. That is to say that bow the "details and voices pop out at you" depends upon the output level of your audio source and/or the input-level setting on the decoder.

We felt that since these input factors were unpredictable and that smoothness of the logic action was a priority, the enhancement systems had to be proportional and have wide dynamic range.

In order to have spaciousness and width we also used fast time constants. The total effect is, we believe, greater accuracy and agility with less noticeable logic action.

The problem with our approach is that "errors" in the program become more apparent. That is specifically why we gave the user the ability to adjust the amount of enhancement.

Mr. Sommerwerck heavily weighted his
**STEREOPHILE**

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In the last episode, other CD players were still trying to sound like analog turntables. They still are! We have something different in mind. We want it all! The dynamics, clarity and silence of digital with the sweetness, openness and ambience of analog. We've got it all! Starting with the new CD-1b at $495, or the simply incomparable CD-2, both with full one year warranty. We will modify your Philips based player. Available from our dealers or direct. Musical Concepts • 1 Patterson Plaza • Florissant, MO 63031 • 314-831-1822
opinions based on sound quality. We would like to point out that the circuit path in the ESP-7000 is essentially the same as we use in our professional products. These products have been reviewed extensively in professional journals; the one term that is often used is "invisible" (Recording Engineering/Producer, April, 1984).

This stands in marked contrast to Mr. Sommerwerck's best-rated unit, which exhibits frequency-response changes based on output-level setting, length of cable, type of cable, and the input impedance of the following amplifier. What another reviewer called "dull and compressed" (see The Perfect Vision, Indian Summer, 1987), Mr. Sommerwerck refers to as "gorgeously rounded-off."

Even if the resultant roll-off of the signal is pleasant, how can that square with Mr. Sommerwerck's analysis that the "midrange and high end really open up" (emphasis added)?

The DSR on the ESP-7000 "monos" the input signal's higher frequencies. The result is that the Surround, as well as Left and Right Front, will be a bit more dull, but sibilant dialog will remain locked in center. Mr. Sommerwerck verified the ESP-7000's accuracy when he noted that the high frequencies were not appearing in the Surround.

It is not the purpose of this letter to take anything away from the Shure unit, which is a fine decoder. It is a hope that your readers will have a greater understanding of the differences between decoder designs and that, stripped of emotion and hyperbole, be able to make a more accurate analysis on their own.

Marvin Caesar, President
Ahex Systems Ltd.

Fosgate DSM-3602

Editor:

Bill Sommerwerck's review of surround audio processors left us puzzled as to how he could hear any sonic deficiencies in the signal path of our decoder. We incorporate several sophisticated measures for eliminating certain sonic colorations; one of these is the subject of a patent filing.

We spoke with Bill to learn how he conducted his test, and after several hours we were able to recreate the characteristic that he described to us on the phone and later in his review. Fortunately, we were able to isolate the "culprit."

Bill told us that he had dubbed a number of titles from laser disc to a hi-fi VCR format for convenience purposes. This approach can cause some degree of "veiling" as a result of an additional noise-reduction system, electrolytic capacitors, and other passive/active devices being added to the signal path. We believe it to be a reasonable assumption that a reviewer for Stereophile would not compromise a preamplifier review by dubbing various vinyl sources to tape, then replaying the tape through the tape loop simply for convenience purposes. At this point readers should remember that Bill used a CD for bypass comparisons at the beginning of the evaluations and heard no grunge from either our processors or any of the other logic-types.

Most readers are aware that "hi-fi" VCR formats are precisely that—"hi-fi" but not necessarily "audiophile." Both BETA and VHS machines incorporate companding systems similar to CX in design but much more severe in action. These systems extend dynamic range and improve S/N ratios, but, of utmost importance, they conceal head-switching noise. In the case of VHS hi-fi machines (and BETA formats are only marginally better), the head-switching noise is only 35dB below program level. If the compander in the VCR mistracks, it allows bursts of head-switching noise to ride on the audio-signal waveform. We are confident this is what Bill heard from our decoder.

The effect is normally masked on stereo playback unless compander error becomes quite high, but high-speed logic surround decoders with wide-decoding dynamic range will be merciless in revealing it unless adjusted to mask it. Some laser discs and players will create a similar but less severe condition because of modulation noise on disc and/or mistracking of the analog CX compander.

We became aware that some hi-fi VCRs could create this condition in early December of last year. An engineer at Dolby Labs did confirm that head-switching noise might upset some logic decoders, but felt confident that it would seldom be a problem with Pro-Logic designs because of the "slowness" of the design. Our DSM series are not "slow" designs, however. We designed other capabilities into them in addition to Dolby MP. Fortunately, our dilemma was shortlived. There is a button on our models DSM 3602 and 3604 which is
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labeled "Dolby Sur" (it's labeled "Movie Logic" on the 3603). Disengaging this button reconfigures the dynamics of the logic circuitry to accommodate mistracking compandors in hi-fi VCRs and video laser players. Fosgate DSM-series units manufactured after early December incorporate minor parts-value changes to eliminate this audible artifact regardless of the logic-switch position. The artifact was not heard from the HTS 5200 because its slow time constants appear to essentially duplicate the action of the Pro-Logic design. Our measurements of the HTS 5200 front channels indicate that a gentle rolloff starts about 10kHz. The combination of the rolloff and the slow time constants appears to provide a masking effect. Recent changes on the DSM series, as noted, prove that it is possible to mask the noise as well as maintain full audio bandwidth.

During our demos at the Winter CES, we provided, on request, A/B comparisons of our processors and the Shure HTS 5200. I think that Stereophile readers will agree that KEF 107s, BEL amplifiers, a SOTA/SME/Sumiko TT combo, a Counterpoint preamp, and Kimber speaker cables should provide a system revealing enough for any comparison of surround processors. Not one listener complained of any sonic flaws or grunge from any of the processors—most simply noticed that the HTS 5200 sounded more "closed in." Only one listener preferred the HTS 5200's soundfield.

We've designed and manufactured surround processors for over a decade. Our early logic designs were for audio-only applications, while our present designs accommodate Dolby-encoded video as well as non-encoded stereo sources. Conversely, Shure Bros. quite openly claim the HTS series to be functional equivalents of Dolby theater processors—complete with the tradeoffs that, while valid for large-scale auditorium use, present, in our opinion, compromises for the home environment and critical listening.

Bill comments that Shure stays in close touch with film people, etc. Likewise, a number of people in the film and broadcast industry use our products. Our program sources also include a large library of laser discs, direct-broadcast digital stereo by satellite, and direct access to 35mm optical stereo film prints processed by our DSM 3602.

It is obvious that Fosgate and Shure products do offer the consumer some very clear-cut choices.

Finally, some corrections of a minor nature, and a closing thought.
1) Bill suggests that manufacturers redesign their units to decode MP Matrix without filters or time delay. The "Wide" modes of all of our DSM series do just that.
2) The DSM 3602 can be used with only four speakers, if desired, and provide full functional capability.
3) All DSM series provide a subwoofer output.
4) In theory, our 3603 should sound the best, but in practice we are hard pressed to hear any consistent differences between any of our models.
5) Pro-Logic parameters are well-defined by Dolby Laboratories, who audition products and visit their licensees on a regular basis.
6) Logic circuitry is a necessary part of a surround decoder, unless one is antisocial and willing to sit in the "sweet spot" of the room, without moving, and tolerate only 3dB of separation between some channels. We aren't!

And finally, we have never heard a satisfying, much less satisfactory, Ambisonics demo. There are documentable reasons why it is not suitable for applications such as motion-picture theaters, where high-separation directionality and image localization is required. Perhaps it is time for an opposing viewpoint from Peter Scheiber or Martin Willcocks.

We do agree with Bill that the world of surround audio deserves a more advanced process than Dolby MP for music-only listening, as well as improved processor designs. We're trying to do our part. We offer a friendly "challenge" to Bill or any other interested members of the Stereophile staff to audition our new "PLUS" editions.

Thanks for allowing the space for this response.

Jim Fosgate, President Fosgate, Inc.

Shure HTS-5200

Editor:
Thank you for the thoughtful and in-depth review of decoder products designed for use with program material encoded using the Dolby Motion Picture matrix process (Dolby Stereo/Dolby Surround). We, of course, take issue with the statement that Dolby Surround is the worst possible consumer Surround
System, and that the things that make it ideal for theatrical use make it the worst possible system for home use. We believe, based on our extensive research and development activities, that the basic technical elements of the Dolby Stereo Process (the encoding and decoding matrix, speaker placement, rear-channel delay, and carefully engineered logic action) are very suitable for adaptation to the home environment. Given the limited ability of two audio signal-transmission channels to carry the surround directional information in sufficient detail to be convincing over a wide listening area, the Dolby parameters represent good choices optimized for a Front-stage-oriented audio/video presentation. This process allows the creation of specific directional effects across the Front stage with more diffuse localization to the Rear. This is very much the way we as individuals experience the real world: with frontal information being dominant. In addition, this process can provide localization accuracy for a wide range of listener positions, not just for those along the center line of the room.

Finally, I would like to state that what we are dealing with is a technological art form (just as we are with two-speaker stereo), and that as the recording, duplication, and reproduction technologies improve, so can this surround process. As an example, the bandwidth of the Surround channel can be extended as greater control is obtained over relative amplitude and phase errors between channels. With the present state of software technology, a wider-bandwidth Surround channel simply does not sound better.

Robert B. Schulein, General Manager
SSI-720
Shure Home Theater Sound Division

CAL Tempest CD player
Editor:
I would like to call your attention to an error in your January 1988 issue (Vol.11 No.1). In that issue George Graves reviewed the Denon DAP-5500 Line Level Control Unit, which he found to be of considerable merit. However, in his enthusiasm George committed an error which could be terribly misleading. He states that the California Audio Labs Tempest used op-amps in the analog filtration stage. This is most definitely not true. The original Tempest used no semiconductors in the signal path, neither op-amps nor any other solid-state device. I do not believe that it would have been possible to achieve the level of sound quality of the Tempest without the elimination of such devices as op-amps. Further, the all-new Tempest II, which was introduced this
January, maintains this tradition; it also uses no semiconductors in the signal path. In addition, the Tempest II uses no capacitors in the signal path, being a DC-coupled device. I think it would be of interest to your readers if you were to set the record straight on this matter.

Art Paymer
California Audio Labs

Nakamichi not Yamaha!
Editor:
We would like to point out to you that there is a misprint found in the “Winners and Losers” section of Showbiz on p.67 of the December 1987 issue of Stereophile.

It should have read Nakamichi’s CA-7E preamp, not “Yamaha’s.” Your correction of it would be greatly appreciated.

Jun Sakamoto
Nakamichi America Corporation

Hafler XL-280
Editor:
The November issue included three remarks which deserve comment.

1) p.31: “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.”

2) p.94: “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.”

The first is a gratuitous remark in Sam Telig’s comments regarding an entirely different amplifier. Since we have not had the benefit of Sam’s audition of the XL-280 before this, we wonder how facetious it was. But, Oh! the temptations of reprinting such a quote! The second was from the “Recommended Components” list.

The important point here is to disclaim your repeated snide references to the XL-280 as “perfect,” implying that it is our term. It is not! Accurate—yes. But we have never claimed perfection, though we are constantly striving for it. We do claim the XL-280 is unequivocally, unassailably, and measurably more accurate within the audible range than any other amplifier we or anyone else to date has tried, using a simple definitive test which no one has been able to refute. If you prefer another sound, that is your prerogative.

It is possible for less accurate amplifiers to have pleasing sound, even to being preferred in system combinations. Measurements often can point up the deficiencies which may be nonetheless euphonious. The amplifier portion of the audio chain is the singular element which can be quantified most completely, so accuracy—how close you can approach perfection—should be the designer’s insistent goal. If a design’s accuracy is unchallenged, then it should become the reference for ancillary product design to achieve what is most pleasing to the ear as a system. As we achieve means of more fully quantifying other audio elements, we will indeed narrow the gap to “perfection.”

We haven’t heard a peep from any reviewer, present company included, on minor revisions we made months ago to the XL-280 Excelinear circuit, which we submitted as a production update after the first units which prompted the reviews. The changes accomplished even deeper nulls in the SWDT, and while we don’t look for the results to sound any different (more nearly perfect?), we’d like to get our critics’ opinions. They invariably seem to hear distinctions which elude us.

3) p.115: “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.” (emphasis ours)

The differential test still holds the most promise for resolving matters of accuracy, and we have used it as a design tool in component and circuit selection. In other circumstances, the blind (or double-blind) test is the most meaningful test for the logical critic. There have been any number of purchasers, ourselves included, of the ABX comparator alone who regard only truly blind comparisons as meaningful. I submit that quite a few manufacturers, if not distributors, do assess products or product elements using blind tests. The problem is that the “erudite audio press” too often chooses to ignore specific logic in its re-

Stereophile, March 1988 187
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Stereophile, March 1988

DNM solid-core cable

Editor:
Dick Olsher's analysis of Alvin Gold's article on solid-core cables in Vol.10 No.6 seems to highlight a dilemma in our general approach to hi-fi which may be slowing progress toward better hi-fi systems. I would like to deal with the issues raised, which were resistance, phase accuracy, and listening trials.

The heavy-gauge approach to close-coupling the amplifier to the loudspeaker is extremely illogical; it has gone too far and does not help in our particular application, which is driving a reactive remote load with a controlled AC voltage and unrestricted current. It is not sensible to accurately track the load resistance from the output side of the feedback resistor and effectively bolt the amplifier to the speaker terminals. If this approach is taken, extra components must be used to maintain the feedback amplifier's stability; these are very damaging to sound quality. The heavyweight cables used to achieve this coupling add to these sonic problems. Dick Olsher does not seem to acknowledge that it must be more sensible to use the open-loop gain of the amplifier to detect the loudspeaker errors and then design the cable for acceptably low power loss using its slight resistance as a nearly perfect resistor for feedback stabilization. (There is a big difference between the sonic effect of a physically large lumped-resistor component and the almost ideal distributed resistance in a well-designed cable.)

A famous manufacturer of radio-frequency cables expressed great astonishment recently when I described to their technical people the trend in hi-fi cable design. They commented that with all the structural complexity, it would be nearly impossible to predict how the cable would perform. Very high-frequency, low-loss cables are solid coaxial designs; they look like small hydraulic tubes on the outside. Inside they are accurately finished, usually with a single solid central core, and of necessity use high-quality dielectrics. Cables to be used from about 20 GHz and above use a few twisted central cores to correct arrival anomalies caused by problems in the dielectric at these very high frequencies! I believe this brief description puts Dick Olsher's comments about phase effects into perspective. I cannot see any advantage in compromising the magnetic symmetry of the cable which affects audio frequencies to gain phase accuracy in the GHz region.

The classification of DNM Solid Core audio performance and the technical specs (diameters, resistance) quoted in DO's article appear to be based on Martin Colloms's Hi-Fi News article rather than direct personal evaluation. Unfortunately, some of the details were incorrect. However, as Dick pointed out, the cable is inexpensive compared with many of the exotic designs with which it was inevitably compared. Perhaps because of this, the conclusion that it is less good than the exotics seems to have caused a sigh of relief.

Our own results are more controversial. When the solid-core cables are used with amplifier systems designed on the same operating principles, none of the expensive complex cables we have tried outperform the DNM solid-core types.

Possibly more important than the cable itself is the discipline of a new way of thinking. For example, the connection between the moving-coil cartridge and preamp clearly should not be made with a massive 1"-diameter conductor, even if it was practical to do so. On the basis of gut feeling, any engineer would instantly say it is wrong, but in the traditional way of thinking he could say specifically why it is unnecessary but maybe not why it is undesirable. The "solid-core field effects" way of looking at this would define all the implications very clearly. Similarly, the approach gives a new, more definite perspective on subjects like circuit-board layout, relative component positioning, casework materials, method of heat-sinking, and component design—all very important aspects of amplifier design.

DNM Design, Brentwood, Essex, England

NAIM

In my article on the Penta Hi-Fi Show (Vol.10 No.9), I mistakenly identified Naim's SBL model as their "Small Box Loudspeaker" (p.63); in point of fact, the acronym stands for "Separate Box Loudspeaker." Also on the same page, the correct prices for the Naim NAC-62 preamp and NAP-90 power amp are $650 and $625, respectively.

-JGH
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A Divergence of Truth?

Before launching forth from my monthly soapbox, I’d like to extend a hearty welcome to new reviewer Arnis Balgalvis, whose first review (of the Well-Tempered Turntable) appears in this issue (p.94). Arnis is a long-time member of The Audiophile Society (of Westchester County), and has contributed for several years to High Performance Review. He brings with him a broad appreciation of live and reproduced sound, a reputation for studied thoroughness in his reviews, and real enthusiasm. We welcome him to our staff.

Also appearing for the first time in this issue (if you exclude our “Letters” section) is John Crabbe, current Contributing Editor and former Editor of HFN/RR. Yet another Brit, you’ll say, but anyone who can use “tintinnabular contributions” and “campanological complication” in the same article—and have them make sense—is prima facie a world-class superstar. Of course, you who have followed international hi-fi for some years will already be familiar with John’s contributions and credentials; for those unfamiliar, it should be enough to say that John Crabbe is to British hi-fi what JGH is to American. I, for one, would love to see more of his delightful (and thorough!—20 CDs reviewed of one piece of music!) prose in our pages.

On to business. Recently, Stereophile held its first-ever contributors conference, for the purpose of renewed and expanded social acquaintance and methodological investigation. Between rounds of beer and enchiladas, one of our principal occupations was updating and comment on Stereophile’s popular “Recommended Components” section, to appear next in Vol.11 No.4.

In spite of constant protestations that any prospective buyer must audition the qualified candidates for himself, we are constantly hounded by manufacturers and dealers for either killing the sale of one product or guaranteeing the sale of another. This implies that people read our reviews (or “Recommended Components”) as gospel, not bothering to audition even what they buy, much less the alternatives.

Such people should have overheard our contributors conference. A lot of people seem to think that our recommendations, in Classes A, B, C, and D, are pretty much like grades in school: a top amplifier is in Class A, Class B is okay, you should think about being seen in Class C, and Class D amounts to slumming. This, however, is not the case. Amplifiers and speakers in Class B are damn good products, just slightly less than the absolute best available; you’d think agreement as to which products deserve such august praise would be easy. With amplifiers, few of us had seriously auditioned more than half of the contenders, but even so there was much disagreement as to what belonged. We finally came up with a group to which no one had serious objections, and every product recommended had at least two strong, knowledgeable proponents.

Though this had not been an acrimony-free discussion, punctuated as it was by looks that said, “Have you had your hearing checked recently?” we didn’t know what was in store for us when it came to speakers. First, none of our reviewers came up with the same ranking of speakers as any other reviewer. Even more striking, all of the reviewers would have disqualified at least some of the speakers that ended up in Class B. Someone would speak up on behalf of the Sound Labs A-3, for instance, or the Celestion SL600, only to hear howls of protest. When the protesters were challenged to produce alternatives—the Thiel 3.5 or the KEF R107, say—these new candidates would themselves be greeted by protest.

The moral? “Recommended Components”—or any specific review, for that matter—is not the final word; it’s only the temporary word (that’s why we publish a monthly magazine), and it may represent the opinion of only some of our staff. Does this mean such ephemeral words lack credence? By no means; only that you, the eventual consumer, must exercise extreme discretion as you sort through our opinions to find those that coincide with yours. You, after all, have to live with, and enjoy music from, the products you purchase.
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